

# QR23 Specification



Date	Version	Remark
On September 7,2016	V1.0	

# contents

<b>1.Introduction</b> .....	1
① QR23.....	1
② Main features .....	1
<b>2.Unit dimension and load paper roll direction</b> .....	2
<b>2.1Unit dimension</b> .....	2
<b>3. PIN definition</b> .....	4
<b>3.1 J3 POWER</b> .....	4
<b>3.2 J4 RS232</b> .....	4
<b>4 Specifications</b> .....	5
<b>5 Command list</b> .....	6
<b>6 command detail</b> .....	8
<b>①print and feed command</b> .....	8
Print and line feed.....	8
Print and carriage return.....	8
Print and feed paper.....	8
Print and feed n lines .....	9
<b>②character command</b> .....	9
Set line spacing.....	9
Select default line spacing .....	10
Set absolute print position.....	10
Set left space.....	10
Set horizontal and vertical movement unit.....	11
Select font type.....	12
Select print mode(s) .....	12
Select character size.....	13
Turn white/black reverse printing mode .....	14
Turn underline mode on/off .....	14
Turn 90clockwise rotation mode on/off.....	15
Select justification (Left justification、centering、Right justification)	
.....	16
Select Chinese character mode .....	16
Cancel Chinese character mode.....	17
Select/cancel user-defined character set.....	17
Define user-defined characters .....	17
Cancel user-defined characters .....	20
Select an international character set .....	20
Select character code table .....	22
<b>③bit image command</b> .....	24
Select bit-image mode .....	24
Define downloaded bit image .....	26
Print downloaded bit image.....	27
Define NV bit image .....	28

	Print NV bit image.....	32
<b>④Tab command</b> .....		34
	Horizontal tab .....	34
	Set horizontal tab positions.....	34
<b>⑤bar code command</b> .....		35
	Select printing position for HRI characters .....	35
	Select bar code height .....	36
	Set bar code width.....	36
	Print bar code.....	37
<b>⑥QR CODE COMMAND</b> .....		42
	Set the model type.....	42
	Set the QR code error correction level error (ECC) .....	42
	Set the QR code graphic data .....	43
	Print store QR codes graphics.....	43
<b>⑦STATUS COMMAND</b> .....		44
	Transmit status.....	44
	Real-time transmission status.....	45
	Enable/Disable Automatic Status Back (ASB) .....	47
<b>⑧Other command</b> .....		48
	Initialize printer .....	48
	Printing test paper .....	48
	Set the print concentration .....	48

## 1.Introduction

### ① QR23

It has good printing quality and high stability, which is widely used in POS system, food service industry and many other fields.

T7 connects other devices via Serial or USB port. It offers drivers for WINDOWS and LINUX operating systems.

Press down the K1 key, print a test page automatically.

The supported operating systems are as below:

WINDOWS XP

WINDOWS 7 32/64

WINDOWS 8

UBUNTU 12.04 32/64

UBUNTU 14.04 32/64

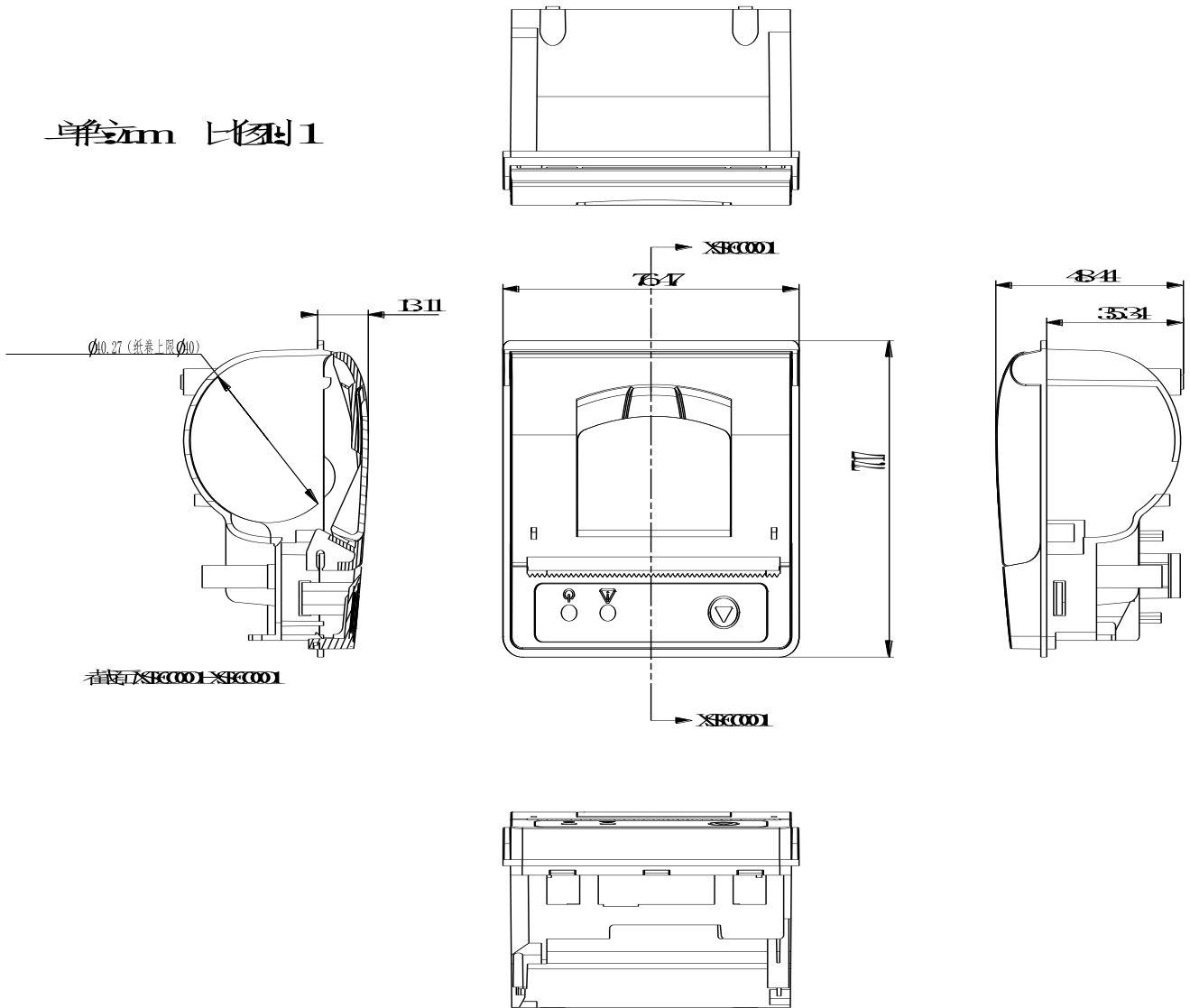
### ② Main features

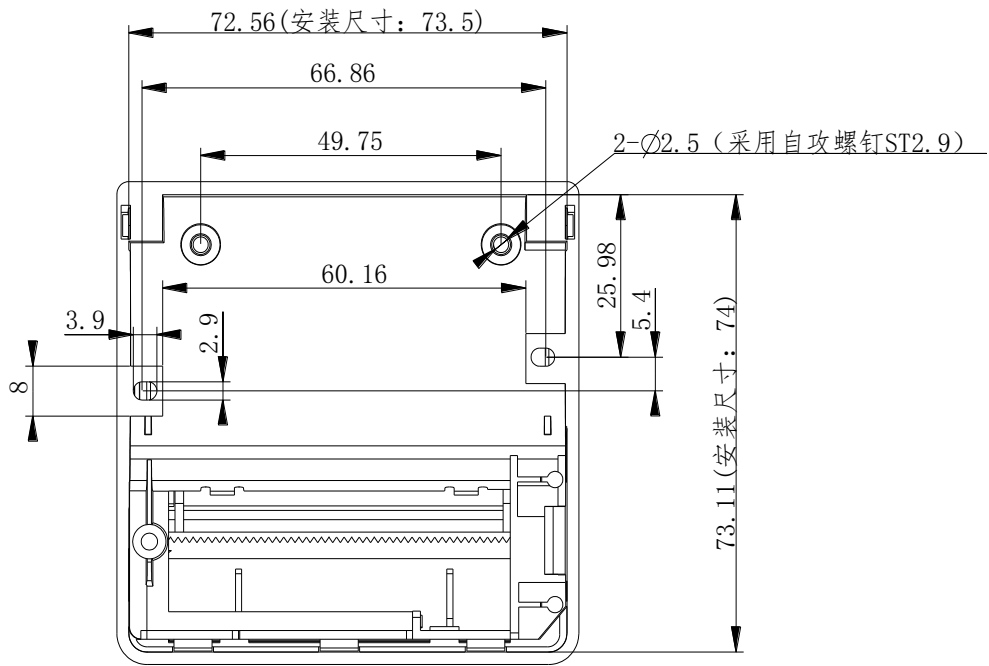
- 1) Low noise .
- 2) Good printing quality .
- 3) Support USB、serial port .
- 4) Support continuous paper printing .

## 2. Unit dimension and load paper roll direction

### 2.1 Unit dimension

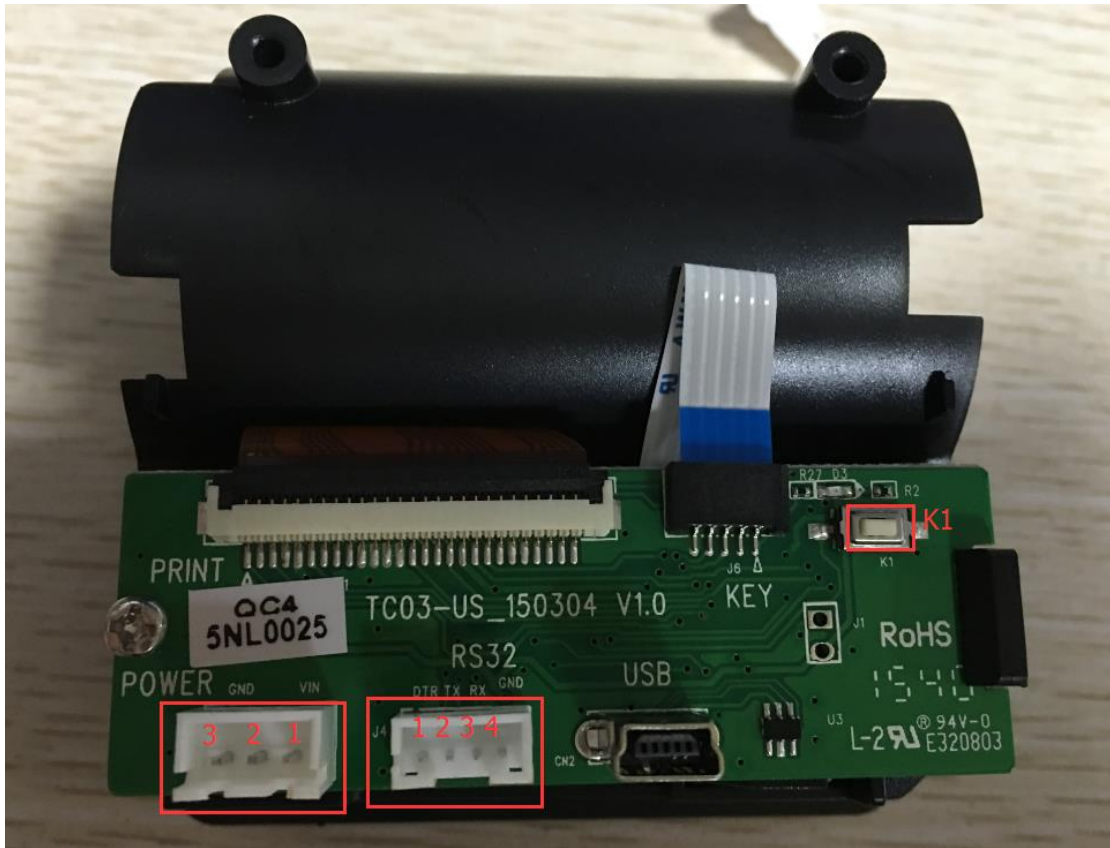
单位尺寸图





**Note:** The figure for the vector diagram, are free to adjust the size.

### 3. PIN definition



#### 3.1 J3 POWER

Pin number	Signal name	function
1	VIN	5~9V
2		
3	GND	GND

#### 3.2 J4 RS232

Pin number	Signal name	function
1	DTR	Flow control
2	TX	printer output
3	RX	printer input
4	GND	GND

## 4 Specifications

Printing Method	Thermal printing
Paper Width	58mm
Printing Width	48mm
Resolution	203DPI
Each row of points	384dots
Printing speed	70 mm/s
Support printing content	GBK, ASCII character, Barcode, Support for different density point bitmap and download the bitmap print, QR code.
Default font	9X17、9X24、8X16(ASCII),24x24(GBK)



## 5 Command list

LF	Print and line feed	<b>Print and feed command</b>
CR	Print and carriage return	
ESC J	Print and feed n points	
ESC d	Print and feed n lines	
ESC 3	Set n points line spacing	<b>character command</b>
ESC 2	Select default line spacing	
ESC \$ nL nH	Set absolute print position	
GS L nL nH	Set left space	
GS P	Set horizontal and vertical movement unit	
ESC ! n	Select print mode(s)	
ESC M n	Select font type	
GS ! n	Select character size	
GS B n	Turn white/black reverse printing mode	
ESC - n	Turn underline mode on/off	
ESC V n	Turn 90 clockwise rotation mode on/off	
ESC a n	Select justification	
FS &	Select Chinese character mode	
FS .	Cancel Chinese character mode	
ESC % n	Select/cancel user-defined character set	
ESC &	Define user-defined characters	
ESC ? n	Cancel user-defined characters	
ESC R n	Select an international character set	
ESC t n	Select character code table	
ESC *	Select bit-image mode	<b>bit image command</b>
GS *	Define downloaded bit image	
GS / m	Print downloaded bit image	
FS q	Define NV bit image	
FS p n m	Print NV bit image	
HT	Horizontal tab	<b>Tab command</b>
ESC D	Set horizontal tab positions	<b>Barcode command</b>
GS H	Select printing position for HRI characters	
GS h	Select bar code height	
GS w	Set bar code width	
GS k	Print bar code	<b>QR codecommand</b>
GS ( k pL pH cn fn n (fn=67)	Set the module type	
GS ( k pL pH cn fn n (fn=69)	Set the QR code error correction level error (ECC)	
GS ( k pL pH cn fn m d1 ... dk	Set the QR code graphic data	

(fn=80)		
GS ( k pL pH cn fn m (fn=81)	Print store QR codes graphics	
GS r n	Transmit status	<b>STATUS command</b>
DLE EOT n	Real-time transmission status	
GS a n	Enable/Disable Automatic Status Back (ASB)	
FF	Print and return to standard mode (In page mode)	
ESC @	Initialize printer	<b>Other command</b>
DC2 T	Printing test paper	
ESC 7	Set the print concentration	

## 6 command detail

### ① print and feed command

#### Print and line feed

Name	Print and line feed
Format	ASCII : LF Decimal: 10 Hex: 0A
Description	Prints the data in the print buffer and feeds one line, based on the current line spacing.
Range	
Default	
Support model	All the printers
Note	
For Example	1B 40 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a 1b 4a 10 1B 40 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a 1b 4a 30 1B 40 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a

#### Print and carriage return

Name	Print and carriage return
Format	ASCII : CR Decimal : 13 Hex : 0D
Description	When automatic line feed is enabled, this command functions the same as <b>LF</b> ; when automatic line feed is disabled, this command is ignored.
Range	
Default	
Support model	All the printers
Note	This command line feed is ignored with a serial interface model. Sets the print starting position to the beginning of the line.
For Example	

#### Print and feed paper

Name	Print and feed paper
Format	ASCII : ESC J n Decimal : 27 74 n Hex: 1B 4A n
Description	Prints the data in the print buffer and feeds the paper [ $n \times 0.125$ mm (0.0049")].
Range	$0 \leq n \leq 255$

Default	
Support modal	All the printers
Note	<ul style="list-style-type: none"> <li>• After printing is completed, this command sets the print starting position to the beginning of the line.</li> <li>• The paper feed amount set by this command does not affect the values set by <b>ESC 2</b> or <b>ESC 3</b>.</li> <li>• In standard mode, the printer uses the vertical motion unit (y).</li> </ul>
For example	1b 40 30 31 32 1b 4a 10

### Print and feed n lines

Name	Print and feed n lines
Format	ASCII : ESC d n Decimal : 27 100 n Hex : 1B 64 n
Description	Prints the data in the print buffer and feeds n lines.
Range	$0 \leq n \leq 255$
Default	
Support modal	All the printers
Note	<ul style="list-style-type: none"> <li>• This command sets the print starting position to the beginning of the line.</li> <li>• This command does not affect the line spacing set by <b>ESC 2</b> or <b>ESC 3</b>.</li> <li>• The maximum paper feed amount is 1016 mm (40 inches). If the paper feed amount (<math>n \times</math> line spacing) of more than 1016 mm (40 inches) is specified, the printer feeds the paper only 1016 mm (40 inches).</li> </ul>
For example	<pre>1b 40 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 1b 64 01 1b 40 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 1b 64 02 1b 40 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 1b 64 00</pre>

## ②character command

### Set line spacing

Name	Set line spacing
Format	ASCII : ESC 3 n Decimal : 27 51 n Hex : 1B 33 n
Description	Sets the line spacing to $[n \times 0.125 \text{ mm}]$ .
Range	$0 \leq n \leq 255$
Default	$n = 33$
Support modal	All the printers
Note	

	<ul style="list-style-type: none"> <li>• If set the line spacing is less than the maximum character height in a line, so the bank line spacing is equal to the maximum character level.</li> <li>• The line spacing can be set default values,when appear ESC 2,ESC @, reset the printer and printerpower</li> </ul>
For example	<pre>1b 40 1b 33 30 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a 1b 32 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a</pre>

### Select default line spacing

Name	Select default line spacing
Format	ASCII : ESC 2 Decimal : 27 50 Hex : 1B 32
Description	Selects 4.125mm (33× 0.125 mm) line spacing.
Range	$0 \leq n \leq 255$
Default	33 Dots
Support modal	All the printers
Note	With reference to ESC 3 command. If set the line spacing is less than the maximum character height in a line, so the bank line spacing is equal to the maximum character level.
For example	

### Set absolute print position

Name	Set absolute print position
Format	ASCII : ESC \$ nL nH Decimal : 27 36 nL nH Hex : 1B 24 nL nH
Description	The distance from the beginning of the line to the print position is[(nL+nH×256)×0.125 mm].
Range	$0 \leq nL \leq 255, 0 \leq nH \leq 255$
Default	
Support modal	All the printers
Note	<ul style="list-style-type: none"> <li>• Settings outside the specified printable area are ignored.</li> <li>• In standard mode, the horizontal motion unit (x) is used.</li> </ul>
For example	<pre>1b 40 1b 24 20 00 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a 1C 26 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a</pre>

### Set left space

Name	Set left space
------	----------------



**Select font type**

Name	Select font type												
Format	ASCII : ESC M n Decimal : 27 77 n Hex : 1b 4d n												
Description	<p>Select font type</p> <table border="1"> <thead> <tr> <th>n</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>0, 48</td> <td>Select font type A (12×24) 。</td> </tr> <tr> <td>1, 49</td> <td>Select font type B (9×24) 。</td> </tr> <tr> <td>2, 50</td> <td>Select font typeC (9×17)</td> </tr> <tr> <td>3, 51</td> <td>Select font typeD (8×16)</td> </tr> <tr> <td>4, 52</td> <td>Select font typeE (16×18)</td> </tr> </tbody> </table>	n	Function	0, 48	Select font type A (12×24) 。	1, 49	Select font type B (9×24) 。	2, 50	Select font typeC (9×17)	3, 51	Select font typeD (8×16)	4, 52	Select font typeE (16×18)
n	Function												
0, 48	Select font type A (12×24) 。												
1, 49	Select font type B (9×24) 。												
2, 50	Select font typeC (9×17)												
3, 51	Select font typeD (8×16)												
4, 52	Select font typeE (16×18)												
Range	n= 0, 1,2,3,4, 48, 49, 50,51,52												
Default	n = 0												
Support	Some model												
Note	• ESC !Also can choose font type,but in the end receives the command set effective.												
For example	<pre>1b 40 1b 4d 00 30 31 32 0d 0a 1b 4d 01 30 31 32 0d 0a 1b 4d 02 30 31 32 0d 0a 1b 4d 03 30 31 32 0d 0a 1b 4d 04 30 31 32 0d 0a</pre>												

**Select print mode(s)**

Name	Select print mode(s)															
Format	ASCII : ESC ! n Decimal : 27 33 n Hex : 1B 21 n															
Description	<p>Selects print mode(s) using n as follows: (Font、white/black reverse、Inversion、Bold、double-height、double-width、underline)</p> <table border="0"> <thead> <tr> <th>bit</th> <th>function</th> <th>value</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>1</td> <td></td> </tr> <tr> <td>0</td> <td>font</td> <td>normal small</td> </tr> <tr> <td>1</td> <td>inverse</td> <td>cancel set</td> </tr> <tr> <td>2</td> <td>inversion</td> <td>cancel set</td> </tr> </tbody> </table>	bit	function	value	0	1		0	font	normal small	1	inverse	cancel set	2	inversion	cancel set
bit	function	value														
0	1															
0	font	normal small														
1	inverse	cancel set														
2	inversion	cancel set														

	<p>3 bold cancel set</p> <p>4 double-heightcancel set</p> <p>5 double-width cancel set</p> <p>6 underline cancel set</p> <p>7 undefined</p>
Range	
Default	n = 0
Supprot modal	All the printers
Note	The command for Chinese fonts and foreign fonts are effective ESC @,dump and restart,Reset the printer,This command setting failure
For example	<p>1B 40 1B 21 01 30 31 32 0D 0A</p> <p>1B 40 1B 21 02 30 31 32 0D 0A</p> <p>1B 40 1B 21 04 30 31 32 0D 0A</p> <p>1B 40 1B 21 08 30 31 32 0D 0A</p> <p>1B 40 1B 21 10 30 31 32 0D 0A</p> <p>1B 40 1B 21 20 30 31 32 0D 0A</p> <p>1B 40 1B 21 40 30 31 32 0D 0A</p> <p>1B 40 1B 21 80 30 31 32 0D 0A</p>

### Select character size

Name	Select character size																																																						
Formal	<p>ASCII : GS ! n</p> <p>Decimal : 29 33 n</p> <p>HEX : 1d 21 n</p>																																																						
Description	<p><math>1 \leq \text{vertical number of times} \leq 8, 1 \leq \text{horizontal number of times} \leq 8</math></p> <p>Selects the character height using bits 0 to 2 and selects the characterwidth using bits 4 to 7, as follows:</p> <p style="text-align: center;"><b>Table 1Table 2</b></p> <p style="text-align: center;">Set the width of character Set the height of character</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>HEX</th> <th>Decim al</th> <th>width</th> <th>HEX</th> <th>Decimal</th> <th>width</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>0</td> <td>1 (normal)</td> <td>00</td> <td>0</td> <td>1 (normal)</td> </tr> <tr> <td>10</td> <td>16</td> <td>2 (double- width)</td> <td>01</td> <td>1</td> <td>2 (double-h eight)</td> </tr> <tr> <td>20</td> <td>32</td> <td>3</td> <td>02</td> <td>2</td> <td>3</td> </tr> <tr> <td>30</td> <td>48</td> <td>4</td> <td>03</td> <td>3</td> <td>4</td> </tr> <tr> <td>40</td> <td>64</td> <td>5</td> <td>04</td> <td>4</td> <td>5</td> </tr> <tr> <td>50</td> <td>80</td> <td>6</td> <td>05</td> <td>5</td> <td>6</td> </tr> <tr> <td>60</td> <td>96</td> <td>7</td> <td>06</td> <td>6</td> <td>7</td> </tr> <tr> <td>70</td> <td>112</td> <td>8</td> <td>07</td> <td>7</td> <td>8</td> </tr> </tbody> </table>	HEX	Decim al	width	HEX	Decimal	width	00	0	1 (normal)	00	0	1 (normal)	10	16	2 (double- width)	01	1	2 (double-h eight)	20	32	3	02	2	3	30	48	4	03	3	4	40	64	5	04	4	5	50	80	6	05	5	6	60	96	7	06	6	7	70	112	8	07	7	8
HEX	Decim al	width	HEX	Decimal	width																																																		
00	0	1 (normal)	00	0	1 (normal)																																																		
10	16	2 (double- width)	01	1	2 (double-h eight)																																																		
20	32	3	02	2	3																																																		
30	48	4	03	3	4																																																		
40	64	5	04	4	5																																																		
50	80	6	05	5	6																																																		
60	96	7	06	6	7																																																		
70	112	8	07	7	8																																																		
Range																																																							
Default	n = 0																																																						



Suuport modal	All the printers
Note	This command is effective for all characters (alphanumeric and Chinese), except for HRI characters. ESC @,dump and restart,Reset the printer,This command setting failure.
For example	1b 40 1c 26 1d 21 10 30 31 32 B0 AE CE D2 D6 D0 BB AA 0d 0a 1B 40 1c 26 1d 21 01 30 31 32 B0 AE CE D2 D6 D0 BB AA 0d 0a 1B 40 1c 26 1d 21 11 30 31 32 B0 AE CE D2 D6 D0 BB AA 0d 0a

### Turn white/black reverse printing mode

Name	Turn white/black reverse printing mode
Format	ASCII : GS B n Decimal: 29 66 n HEX : 1d 42 n
Description	Turns on or off white/black reverse printing mode. <ul style="list-style-type: none"> <li>• When the LSB of n is 0, white/black reverse mode is turned off.</li> <li>• When the LSB of n is 1, white/black reverse mode is turned on.</li> </ul>
Range	
Default	n = 0
Support modal	All the printers
Note	<ul style="list-style-type: none"> <li>• Only the lowest bit of n is valid.</li> <li>• This command is available for built-in characters and user-defined characters.</li> <li>• When white/black reverse printing mode is on, it also applies to character spacing set by <b>ESC SP</b>.</li> <li>• This command does not affect bit images, user-defined bit images, bar codes,HRI characters, and spacing skipped by <b>HT</b>, <b>ESC \$</b>.</li> <li>• This command does not affect the space between lines.</li> <li>• White/black reverse mode has a higher priority than underline mode. Even if underline mode is on, it is disabled (but not canceled) when white/black reverse mode is selected.</li> </ul>
For example	1b 40 1c 26 1d 42 00 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a 1b 40 1c 26 1d 42 01 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a

### Turn underline mode on/off

Name	Turn underline mode on/off
Format	ASCII : ESC - n

	Decimal : 27 45 n HEX : 1B 2D n								
Description	Turns underline mode on or off, based on the following values n: <table border="1"> <thead> <tr> <th>n</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>0, 48</td> <td>Turns off underline mode</td> </tr> <tr> <td>1, 49</td> <td>Turns on underline mode (1 dot thick)</td> </tr> <tr> <td>2, 50</td> <td>Turns on underline mode (2 dots thick)</td> </tr> </tbody> </table>	n	Function	0, 48	Turns off underline mode	1, 49	Turns on underline mode (1 dot thick)	2, 50	Turns on underline mode (2 dots thick)
n	Function								
0, 48	Turns off underline mode								
1, 49	Turns on underline mode (1 dot thick)								
2, 50	Turns on underline mode (2 dots thick)								
Range	$0 \leq n \leq 2, 48 \leq n \leq 50$								
Default	n = 0								
Support modal	All the printers								
Note	<ul style="list-style-type: none"> <li>• The printer can underline all characters (including right-side character spacing), but cannot underline the space set by <b>HT</b>.</li> <li>• The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.</li> <li>• When underline mode is turned off by setting the value of n to 0 or 48, the following data is not underlined, and the underline thickness set before the mode is turned off does not change. The default underline thickness is 1 dot.</li> <li>• Changing the character size does not affect the current underline thickness.</li> <li>• Underline mode can also be turned on or off by using <b>ESC !</b>. Note,</li> </ul>								
For example	<pre>1b 40 1c 26 1b 2d 01 30 31 32 41 42 43 B0 AE CE D2 D6 D0 BB AA 0D 0A 1b 40 1c 26 1b 2d 02 30 31 32 41 42 43 B0 AE CE D2 D6 D0 BB AA 0D 0A 1b 40 1c 26 1b 2d 00 30 31 32 41 42 43 B0 AE CE D2 D6 D0 BB AA 0D 0A</pre>								

### Turn 90clockwise rotation mode on/off

Name	Turn 90° clockwise rotation mode on/off						
Format	ASCII : ESC V n Decimal : 27 86 n HEX : 1B 56 n						
Description	Turns 90° clockwise rotation mode on/offn is used as follows: <table border="1"> <thead> <tr> <th>n</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>0,48</td> <td>Turns off 90° clockwise rotation mode</td> </tr> <tr> <td>1,49</td> <td>Turns on 90° clockwise rotation mode</td> </tr> </tbody> </table>	n	Function	0,48	Turns off 90° clockwise rotation mode	1,49	Turns on 90° clockwise rotation mode
n	Function						
0,48	Turns off 90° clockwise rotation mode						
1,49	Turns on 90° clockwise rotation mode						
Range	$0 \leq n \leq 1, 48 \leq n \leq 49$						
Default	n = 0						
Support modal	All the printers						
Note	<ul style="list-style-type: none"> <li>• This command affects printing in standard mode. However, the setting is always effective.</li> <li>• When underline mode is turned on, the printer does not underline 90°clockwise-rotated characters.</li> </ul>						

	<ul style="list-style-type: none"> <li>• Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions from double-height and double-width commands in normal mode.</li> </ul>
For example	<pre>1b 40 1c 26 1b 56 01 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a 1b 40 1c 26 1b 56 00 30 31 32 41 42 43 CFC3C3C5BFAAB4CFB5E7D7D3 0d 0a</pre>

### Select justification (Left justification、centering、Right justification)

Name	Select justification (left、center、right)								
Format	ASCII : ESC a n Decimal : 27 97 n HEX : 1B 61 n								
Description	Aligns all the data in one line to the specified position.n selects the justification as follows: <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>n</th> <th>Justification</th> </tr> </thead> <tbody> <tr> <td>0,48</td> <td>Left justification</td> </tr> <tr> <td>1, 49</td> <td>Centering</td> </tr> <tr> <td>2, 50</td> <td>Right justification</td> </tr> </tbody> </table>	n	Justification	0,48	Left justification	1, 49	Centering	2, 50	Right justification
n	Justification								
0,48	Left justification								
1, 49	Centering								
2, 50	Right justification								
Range	$0 \leq n \leq 2$ or $48 \leq n \leq 50$								
Default	n = 0								
Support modal	All the printers								
Note	ESC @,dump and restart,Reset the printer,This command setting failure.								
Example	<pre>1B 40 1B 61 02 30 31 32 0D 0A 1B 40 1B 61 01 30 31 32 0D 0A 1B 40 1B 61 00 30 31 32 0D 0A</pre>								

### Select Chinese character mode

Name	Select Chinese character mode
Format	ASCII : FS & Decimal : 28 38 HEX : 1C 26
Description	Selects Chinese character mode.
Range	
Default	
Support modal	All the printers
Note	For Chinese model: <ul style="list-style-type: none"> <li>• When the Chinese character mode is selected, the printer processes all Chinese code as two bytes each.</li> <li>• Chinese codes are processed in the order of the first byte and second byte.</li> </ul>

	<ul style="list-style-type: none"> <li>• Chinese character mode is not selected when the power is turned on.</li> </ul>
For example	<pre>1b 40 1C 26 B0 AEC9 CF D7 D4 BC BA 0d 0a 1C 2E B0 AEC9 CF D7 D4 BC BA0d 0a</pre>

### Cancel Chinese character mode

Name	Cancel Chinese character mode
Format	ASCII : FS . Decimal : 28 46 HEX : 1C 2E
Description	Cancel Chinese character mode
Range	
Default	
Support modal	All the printers
Note	For Chinese model: <ul style="list-style-type: none"> <li>• When the Chinese character mode is not selected, all character codes are processed one byte at a time as ASCII code.</li> <li>• Chinese character mode is not selected when the power is turned on.</li> </ul>
For example	

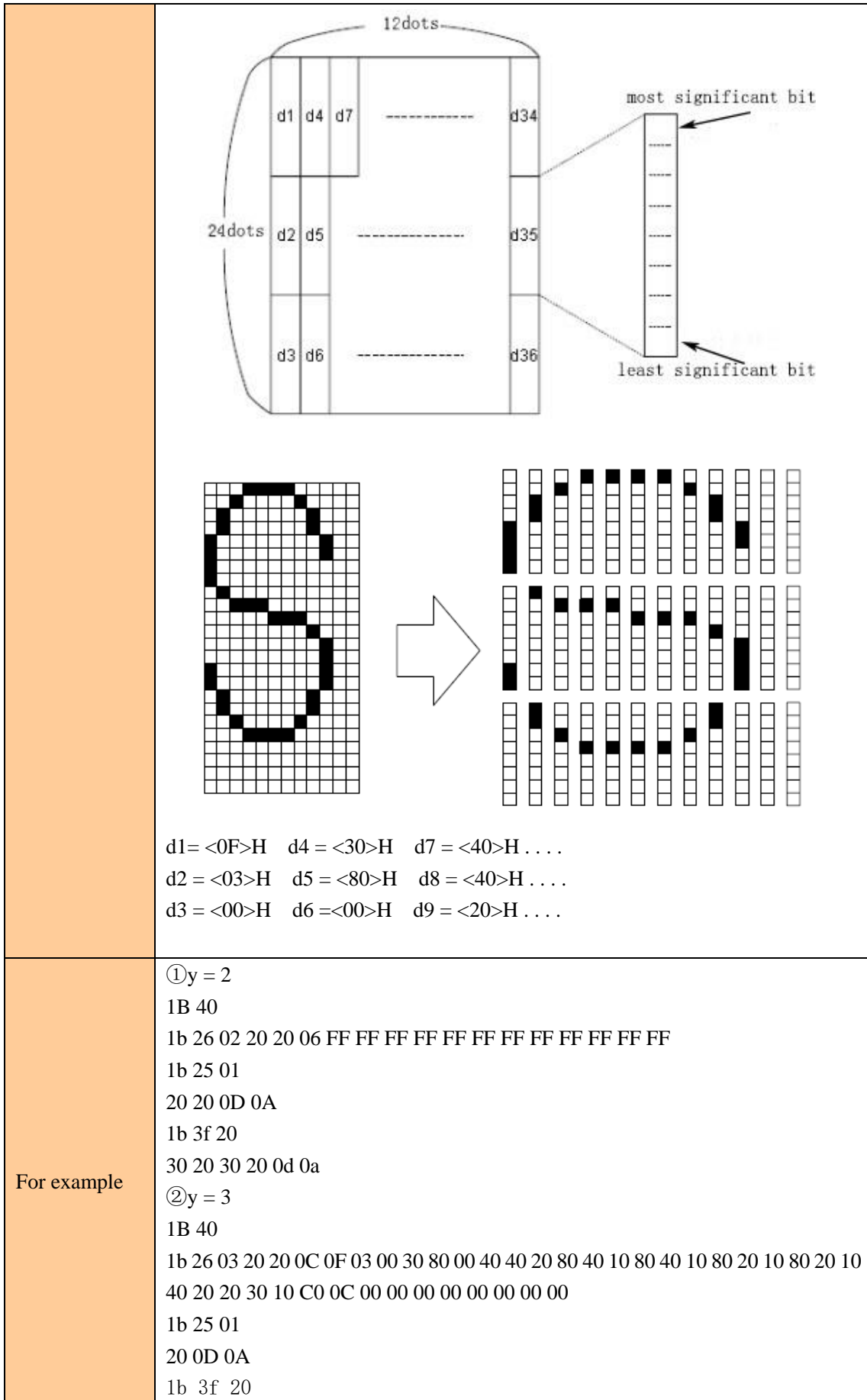
### Select/cancel user-defined character set

Name	Select/cancel user-defined character set
Format	ASCII : ESC % n Decimal : 27 37 n HEX : 1B 25 n
Description	Selects or cancels the user-defined character set. <ul style="list-style-type: none"> <li>• When the LSB of n is 0, the user-defined character set is canceled.</li> <li>• When the LSB of n is 1, the user-defined character set is selected.</li> </ul>
Range	$0 \leq n \leq 255$
Default	0
Support modal	All the printers
Note	<ul style="list-style-type: none"> <li>• When the user-defined character set is canceled, the built-in character set is automatically selected.</li> </ul>
For example	<pre>1B 40 1b 26 03 20 20 0C 0F 03 00 30 80 00 40 40 20 80 40 10 80 40 10 80 20 10 80 20 10 40 20 20 30 10 C0 0C 00 00 00 00 00 00 00 00 1b 25 01 20 0D 0A 1b 3f 20 30 20 30 20 0d 0a</pre>

### Define user-defined characters

Name	Define user-defined characters
------	--------------------------------

Format	<p>ASCII : ESC &amp; y c1 c2 [x1 d1 ... d (yx1)] ... [xk d1 ... d(y x k)]</p> <p>Decimal : 27 38 y c1 c2 [x1 d1 ... d(yx1)] ...[xk d1 ... d(yxk)]</p> <p>HEX : 1B 26 y c1 c2 [x1 d1...d(y x1)]...[xk d1...d(yxk)]</p>
Description	<p>Defines user-defined characters.</p> <ul style="list-style-type: none"> <li>• y specifies the number of bytes in the vertical direction.</li> <li>• c1 specifies the beginning character code for the definition, and c2 specifies the final code.</li> <li>• x specifies the number of dots in the horizontal direction.</li> </ul>
Range	<p>y = 2  <math>0 \leq x \leq 6</math> (when Font A (6×12) is selected)</p> <p>y = 3  <math>32 \leq c1 \leq c2 \leq 126</math>  <math>0 \leq x \leq 12</math> (when Font A (12×24) is selected)  <math>0 \leq d1 \dots d(y \times xk) \leq 255</math></p>
Default	
Support modal	All the printers
Note	<ul style="list-style-type: none"> <li>• The allowable character code range is from ASCII code &lt;20&gt;H to &lt;7E&gt;H (95 characters).</li> <li>• It is possible to define multiple characters for consecutive character codes. If only one character is desired, use c1 = c2.</li> <li>• d is the dot data for the characters. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.</li> <li>• The data to define user-defined characters is (y×x) bytes.</li> <li>• Set a corresponding bit to 1 to print a dot or 0 not to print a dot.</li> <li>• This command can define different user-defined character patterns for each font. To select a font, use <b>ESC !</b></li> <li>• User-defined characters and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared.</li> <li>• The user-defined character definition is cleared when:             <ol style="list-style-type: none"> <li>1) ESC @ is executed.</li> <li>2) GS is executed.</li> <li>3) ESC ? is executed.</li> <li>4) The power is turned off.</li> </ol> </li> <li>• When Font A (12×24) is selected.</li> </ul>



	30 20 30 20 0d 0a
--	-------------------

### Cancel user-defined characters

Name	Cancel user-defined characters
Format	ASCII : ESC ? n Decimal : 27 63 n HEX : 1B 3F n
Description	Cancels user-defined characters.
Range	32 ≤ n ≤ 126
Default	
Support modal	All the printers
Note	<ul style="list-style-type: none"> <li>• This command cancels the patterns defined for the character codesspecified by n. After the user-defined characters are canceled, thecorresponding patterns for the internal characters are printed.</li> <li>• This command deletes the pattern defined for the specified code inthe font selected by <b>ESC !</b>.</li> <li>• If a user-defined characters have not been defined, the printer ignores this command.</li> </ul>
For example	

### Select an international character set

Name	Select an international character set																																		
Format	ASCII : ESC R n Decimal : 27 82 n HEX : 1B 52 n																																		
Description	<p>Selects international character set n from the following table:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>n</th> <th>Character set</th> </tr> </thead> <tbody> <tr><td>0</td><td>U.S.A</td></tr> <tr><td>1</td><td>France</td></tr> <tr><td>2</td><td>Germany</td></tr> <tr><td>3</td><td>U.K</td></tr> <tr><td>4</td><td>Denmark I</td></tr> <tr><td>5</td><td>Sweden</td></tr> <tr><td>6</td><td>Italy</td></tr> <tr><td>7</td><td>Spain I</td></tr> <tr><td>8</td><td>Japan</td></tr> <tr><td>9</td><td>Norway</td></tr> <tr><td>10</td><td>Denmark II</td></tr> <tr><td>11</td><td>Spain II</td></tr> <tr><td>12</td><td>Latin America</td></tr> <tr><td>13</td><td>Korea</td></tr> <tr><td>14</td><td>Slovenia/Croatia</td></tr> <tr><td>15</td><td>China</td></tr> </tbody> </table>	n	Character set	0	U.S.A	1	France	2	Germany	3	U.K	4	Denmark I	5	Sweden	6	Italy	7	Spain I	8	Japan	9	Norway	10	Denmark II	11	Spain II	12	Latin America	13	Korea	14	Slovenia/Croatia	15	China
n	Character set																																		
0	U.S.A																																		
1	France																																		
2	Germany																																		
3	U.K																																		
4	Denmark I																																		
5	Sweden																																		
6	Italy																																		
7	Spain I																																		
8	Japan																																		
9	Norway																																		
10	Denmark II																																		
11	Spain II																																		
12	Latin America																																		
13	Korea																																		
14	Slovenia/Croatia																																		
15	China																																		

Range	$0 \leq n \leq 15$
Default	0
Support modal	All the printers
Note	
For example	<p>1B 40 1C 26 c3 c0 b9 fa 0d 0a  1B 40 1B 52 00  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 B7 A8 B9 FA 0d 0a  1B 40 1B 52 01  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 B5 C2 B9 FA 0d 0a  1B 40 1B 52 02  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 D3 A2 B9 FA 0d 0a  1B 40 1B 52 03  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 B5 A4 C2 F3 0d 0a  1B 40 1B 52 04  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 C8 F0 B5 E4 0d 0a  1B 40 1B 52 05  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 D2 E2 B4 F3 C0 FB 0d 0a  1B 40 1B 52 06  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 CE F7 B0 E0 D1 C0 0d 0a  1B 40 1B 52 07  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 C8 D5 B1 BE 0d 0a  1B 40 1B 52 08  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 C5 B2 CD FE 0d 0a  1B 40 1B 52 09  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 B5 A4 C2 F3 32 0d 0a  1B 40 1B 52 0A  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 CE F7 B0 E0 D1 C0 32 0d 0a  1B 40 1B 52 0B  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 C0 AD B6 A1 C3 C0 D6 DE 0d 0a  1B 40 1B 52 0C  7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a  1B 40 1C 26 BA AB B9 FA 0d 0a</p>



	<pre> 1B 40 1B 52 0D 7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a 1B 40 1C 26 CB B9 C2 E5 CE C4 C4 E1 D1 C7 0d 0a 1B 40 1B 52 0E 7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a 1B 40 1C 26 D6 D0 B9 FA 0d 0a 1B 40 1B 52 0F 7b 23 24 40 5b 5c 5c 5d 5e 60 7b 7c 7d 7e 7d 0d 0a </pre>
--	--

### Select character code table

Name	Select character code table
Format	<pre> ASCII   : ESC t n Decimal : 27 116 n HEX    : 1B 74 n </pre>
Description	n :select code page.

	<b>N</b>	<b>Code Page</b>	<b>N</b>	<b>Code Page</b>
	0	CP437 [U.S.A., Standard Europe]	26	Thai
	1	KataKana	27	CP720[Arabic]
	2	CP850 [Multilingual]	28	CP855
	3	CP860 [Portuguese]	29	CP857[Turkish]
	4	CP863 [Canadian-French]	30	WCP1250[Central Europe]
	5	CP865 [Nordic]	31	CP775
	6	WCP1251 [Cyrillic]	32	WCP1254[Turkish]
	7	CP866 Cyrillic #2	33	WCP1255[Hebrew]
	8	MIK[Cyrillic /Bulgarian]	34	WCP1256[Arabic]
	9	CP755 [East Europe, Latvian 2]	35	WCP1258[Vietnam]
	10	Iran	36	ISO-8859-2[Latin 2]
	11	reserve	37	ISO-8859-3[Latin 3]
	12	reserve	38	ISO-8859-4[Baltic]
	13	reserve	39	ISO-8859-5[Cyrillic]
	14	reserve	40	ISO-8859-6[Arabic]
	15	CP862 [Hebrew]	41	ISO-8859-7[Greek]
	16	WCP1252 Latin I	42	ISO-8859-8[Hebrew]
	17	WCP1253 [Greek]	43	ISO-8859-9[Turkish]
	18	CP852 [Latina 2]	44	ISO-8859-15 [Latin 3]
	19	CP858 Multilingual Latin I +Euro)	45	Thai2
	20	Iran II	46	CP856
	21	Latvian	47	Cp874
	22	CP864 [Arabic]	255	GBK2312
	23	ISO-8859-1 [West Europe]		
	24	CP737 [Greek]		
	25	WCP1257 [Baltic]		
Range	$0 \leq n \leq 255$			
Default	0			
Support modal	All the printers			
Note				
For example	1B 40 1C 2E 1B 74 00 80 81 82 83 84 85 86 87 88 89 8A 8B 8C 8D 8E 8F 90 91 92 93 94 95 96 97 98 9A 9B 9C 9D 9E 9F A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 AA AB AC AD AE AF B0 B1 B2 B3 B4 B5 B6 B7 B8 B9 BA BB BC BD BE BF C0 C1 C2 C3 C4 C5 C6 C7 C8 C9 CA CB CC CD CE CF D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 DA DB DC DD DE DF E0 E1 E2 E3 E4 E5 E6 E7 E8 E9 EA EB EC ED EE EF F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 FA FB FC FD FE FF 0D 0A			

### ③bit image command

#### Select bit-image mode

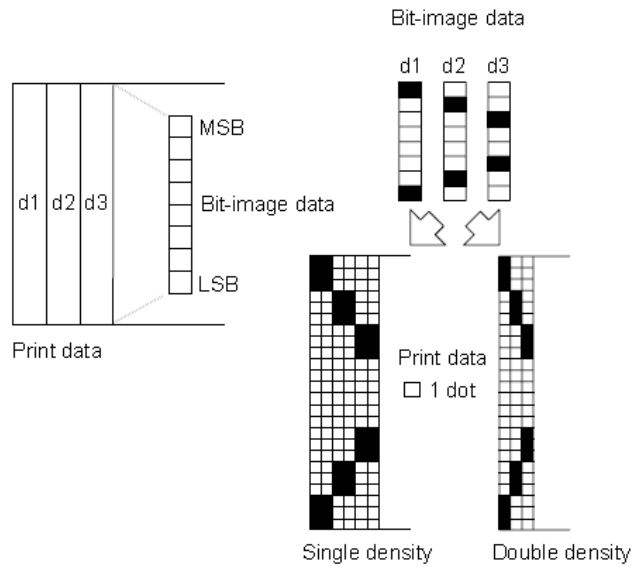
Name	Select bit-image mode																				
Format	ASCII : ESC * m Hl Hh [d]k Decimal : 27 42 m Hl Hh [d]k HEX : 1B 2A m Hl Hh [d]k																				
Description	<p>Selects a bit-image mode using m for the number of dots specified by nL and nH, as follows:</p> <table border="0"> <tr> <td>m</td> <td>mode</td> <td>Horizontal Scale</td> <td>Vertical Scale</td> </tr> <tr> <td>0</td> <td>8-dot single-density</td> <td>×2</td> <td>×3</td> </tr> <tr> <td>1</td> <td>8-dot double-density</td> <td>×1</td> <td>×3</td> </tr> <tr> <td>32</td> <td>24-dot single-density</td> <td>×2</td> <td>×1</td> </tr> <tr> <td>33</td> <td>24-dot double-density</td> <td>×1</td> <td>×1</td> </tr> </table> <p>Hl、Hh specifies the number of dots in the horizontal direction. (Hl+256×Hh) [d]k is bit-image mode datas</p>	m	mode	Horizontal Scale	Vertical Scale	0	8-dot single-density	×2	×3	1	8-dot double-density	×1	×3	32	24-dot single-density	×2	×1	33	24-dot double-density	×1	×1
m	mode	Horizontal Scale	Vertical Scale																		
0	8-dot single-density	×2	×3																		
1	8-dot double-density	×1	×3																		
32	24-dot single-density	×2	×1																		
33	24-dot double-density	×1	×1																		
Range	<p>XX58:</p> <p>m = 0、1、32、33  <math>1 \leq Hl + Hh \times 256 \leq 384</math>  <math>0 \leq d \leq 255</math>  <math>k = Hl + Hh \times 256</math> (当 m = 0、1)  <math>k = (Hl + Hh \times 256) \times 3</math> (当 m = 32、33)</p> <p>XX80:</p> <p>m = 0、1、32、33  <math>1 \leq Hl + Hh \times 256 \leq 576</math>  <math>0 \leq d \leq 255</math>  <math>k = Hl + Hh \times 256</math> (当 m = 0、1)  <math>k = (Hl + Hh \times 256) \times 3</math> (当 m = 32、33)</p>																				
Default																					
Support modal	All the printers																				
Note	<p>If the value of m is out of the specified range, nL and nH the data following are processed as normal data.</p> <p>The nL and nH indicate the number of dots in the bit image in the horizontal direction. The number of dots is calculated by nL + nH - 256.</p> <p>If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.</p> <p>d indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 not to print a dot.</p> <p>After printing a bit image, the printer returns to normal data</p>																				

processing mode.

This command is not affected by print modes (emphasized, double-strike, underline, character size, or white/black reverse printing), except upside-down printing mode.

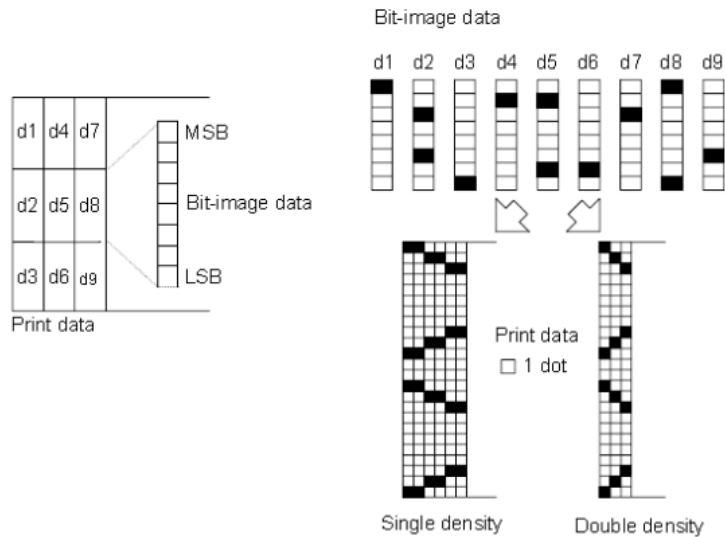
The relationship between the image data and the dots to be printed is described in Figure 3.11.3.

When 8-dot bit image is selected:



3.11.3

When 24-dot bit image is selected:



3.11.3

For example

1B 40  
1b 2a 00 0C 00 FF FF FF FF FF FF FF FF FF FF FF  
1B 33 00

	0A
--	----

### Define downloaded bit image

Name	Define downloaded bit image
Format	ASCII : GS * x y d1...d(x×y×8) Decimal : 29 42 x y d1 ...d(x×y×8) HEX : 1D 2A x y d1...d(x×y×8)
Description	Defines a downloaded bit image using the number of dots specified by x and y. <ul style="list-style-type: none"> <li>• x specifies the number of dots in the horizontal direction.</li> <li>• y specifies the number of dots in the vertical direction.</li> </ul>
Range	$1 \leq x \leq 255$ $1 \leq y \leq 48$ $x*y \leq 1536$ $0 \leq d \leq 255$
Default	
Support modal	All the printers
Note	<ul style="list-style-type: none"> <li>• If <math>x \times y</math> is out of the specified range, this command is disabled.</li> <li>• The d indicates bit-image data. Data (d) specifies a bit printed as 1 and not printed as 0.</li> <li>• The downloaded bit image definition is cleared when:                             <ol style="list-style-type: none"> <li>1) ESC @ is executed.</li> <li>2) ESC &amp; is executed.</li> <li>3) Printer is reset or the power is turned off.</li> </ol> </li> <li>• The following figure shows the relationship between the downloaded bit image and the printed data.</li> </ul>

For example	<pre> 1B 40 1D 2A 0a 08 ff 00 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 ff 00 00 00 00 00 ff 00 00 00 00 00 ff 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 ff ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 ff 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 ff ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 ff 00 00 00 00 00 00 00 00 00 00 ff 1D 2F 03 </pre>
-------------	---

### Print downloaded bit image

Name	Print downloaded bit image
Format	ASCII : GS / m Decimal : 29 47 m HEX : 1D 2F m

Description	Prints a downloaded bit image using the mode specified by m.m selects a mode from the table below:										
	<table border="1"> <thead> <tr> <th>n</th> <th>Mode</th> </tr> </thead> <tbody> <tr> <td>0, 48</td> <td>Normal</td> </tr> <tr> <td>1, 49</td> <td>Double-width</td> </tr> <tr> <td>2, 50</td> <td>Double-height</td> </tr> <tr> <td>3, 51</td> <td>Quadruple</td> </tr> </tbody> </table>	n	Mode	0, 48	Normal	1, 49	Double-width	2, 50	Double-height	3, 51	Quadruple
	n	Mode									
	0, 48	Normal									
	1, 49	Double-width									
2, 50	Double-height										
3, 51	Quadruple										
Range	$0 \leq m \leq 3$ $48 \leq m \leq 51$										
Default											
Support modal	All the printers										
Note	<ul style="list-style-type: none"> <li>• This command is ignored if a downloaded bit image has not been defined.</li> <li>• In standard mode, this command is effective only when there is no data in the print buffer.</li> <li>• This command has no effect in the print modes (emphasized, double-strike, underline, character size, or white/black reverse printing), except for upsidedown printing mode.</li> <li>• If the downloaded bit-image to be printed exceeds the printable area, the excess data is not printed.</li> </ul>										
For example											

### Define NV bit image

Name	Define NV bit image
Format	ASCII : FS q n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n Decimal : 28 113 n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n HEX : 1C 71 n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n
Description	Define the NV bit image specified by n. <ul style="list-style-type: none"> <li>• n specifies the number of the defined NV bit image.</li> <li>• xL, xH specifies <math>(xL + xH \times 256) \times 8</math> dots in the horizontal direction for the NV bit image you are defining.</li> <li>• yL, yH specifies <math>(yL + yH \times 256) \times 8</math> dots in the vertical direction for the NV bit image you are defining.</li> </ul>
Range	$1 \leq n \leq 255$ $0 \leq xL \leq 255$ $0 \leq xH \leq 3$ $(1 \leq (xL + xH * 256) \leq 1023)$ $0 \leq yL \leq 255$ $0 \leq yH \leq 1$ $(1 \leq (yL + yH * 256) \leq 288)$ $0 \leq d \leq 255$ $k = (xL + xH * 256) * (yL + yH * 256) * 8$ Total defined data area = 64K Bytes
Default	

Support modal	All the printers
Note	<p>Frequent write command executions may damage the NV memory. Therefore, it is recommended to write the NV memory 10 times or less a day.</p> <p>The printer performs a hardware reset after the procedure to place the image into the NV memory. Therefore, user-defined characters, downloaded bit images should be defined only after completing this command. The printer clears the receive and print buffers and resets the mode to the mode that was in effect at power on. (this version is not support hardware reset )</p> <p>This command cancels all NV bit images that have already been defined by this command.</p> <p>From the beginning of the processing of this command till the finish of hardware reset, mechanical operations (including initializing the position of the print head when the cover is open, paper feeding using the FEED button, etc.) cannot be performed.</p> <p>During processing of this command, the printer is BUSY when writing data to the user NV memory and stops receiving data. Therefore it is prohibited to transmit the data, including real-time commands, during the execution of this command.</p> <p>NV bit image is a bit image defined in non-volatile memory by FS q and printed by FS p.</p> <p>In standard mode, this command is effective only when processed at thebeginning of the line.</p> <p>This command is effective when 7 bytes &lt;FS yH&gt; of the command areprocessed normally.</p> <p>When the amount of data exceeds the capacity left in the range defined by xL, xH, yL, yH, the printer processes xL, xH, yL, yH out of the defined range.</p> <p>In the first group of NV bit images, when any of the parameters xL, xH, yL, yH is out of the definition range, this command is disabled.</p> <p>In groups of NV bit images other than the first one, when the printer encounters xL, xH, yL, yH out of the defined range, it stops processing this command and starts writing into the NV images. At this time, NV bit images that haven't been defined are disabled (undefined), but any NV bit images before that are enabled.</p> <p>The d indicates the definition data. In data (d) a 1 bit specifies a dot to be printed and a 0 bit specifies a dot not to be printed.</p> <p>This command defines n as the number of a NV bit image. Numbers rise in order from NV bit image 01H. Therefore, the first data group [xL xH yL yH d1...dk] is NV bit image 01H, and the last data group [xL xH yL yH d1...dk] is NV bit image n. The total agrees with the number of NV bit images specified by the command FS p.</p> <p>The definition data for an NV bit image consists of [xL xH yL yH</p>



d1...dk]. Therefore, when only one NV bit image is defined n=1, the printer processes a data group [xL xH yL yH d1...dk] once. The printer uses ([data: (xL xH× 256)×(yL yH× 256)×8] [header :4]) bytes of NV memory.

The definition area in this printer is a maximum of 192K bytes. This command can define several NV bit images, but cannot define bit image data whose total capacity [bit image data header] exceeds 192K bytes.

The printer does not transmit ASB status or perform status detection during processing of this command even when ASB is specified.

Once an NV bit image is defined, it is not erased by performing ESC @, reset, and power off.

This command performs only definition of an NV bit image and does not perform printing. Printing of the NV bit image is performed by the FS pcommand.

**For example :** xL = 64, xH = 0, yL = 96, yH = 0





	<p>character size, white/black reverse printing, or 90° rotated characters, etc.), except upside-down printing mode.</p> <ul style="list-style-type: none"> <li>• If the downloaded bit-image to be printed exceeds one line, the excess data is not printed.</li> <li>• This command feeds dots (for the height <math>n</math> of the NV bit image) in normal and double-width modes, and (for the height <math>n \times 2</math> of the NV bit image) in doubleheight and quadruple modes, regardless of the line spacing specified by <b>ESC 2</b> or <b>ESC 3</b>.</li> <li>• After printing the bit image, this command sets the print position to the beginning of the line and processes the data that follows as normal data.</li> </ul>
For example	

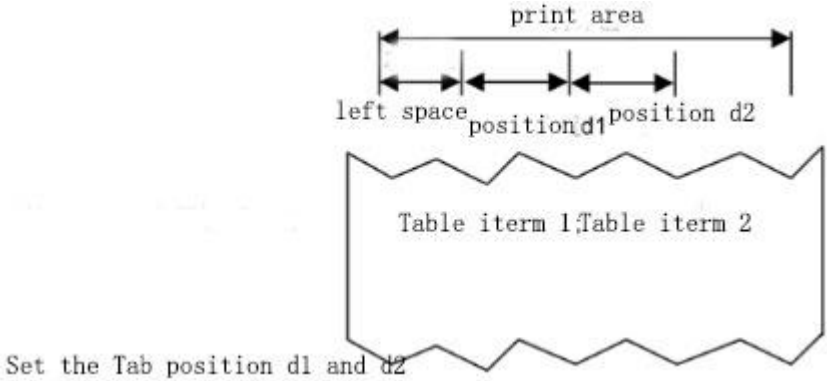
## ④ Tab command

### Horizontal tab

Name	Horizontal tab
Format	ASCII : HT Decimal : 9 HEX : 09
Description	Moves the print position to the next horizontal tab position.
Range	
Default	
Support modal	All the printers
Note	<p>This command is ignored unless the next horizontal tab position has been set.</p> <p>If the next horizontal tab position exceeds the printing area, the printer sets the printing position to [printing area width + 1].</p> <p>Horizontal tab positions are set with ESC D.</p> <p>If this command is received when the printing position is at [printing area width + 1], the printer executes print buffer-full printing of the current line and horizontal tab processing from the beginning of the next line.</p>
For example	

### Set horizontal tab positions

Name	Set horizontal tab positions
Format	ASCII : ESC D [d]k NUL Decimal : 27 68 [d]k 0 HEX : 1B 44 [d]k 00
Description	<p>Sets horizontal tab positions.</p> <ul style="list-style-type: none"> <li>• d[k] specifies the column number for setting a horizontal tab position from the beginning of the line.</li> <li>• k indicates the total number of horizontal tab positions to be set.</li> <li>• NULL is end mark.</li> </ul>
	<p>XX58: <math>1 \leq d \leq 46</math> (<math>d_1 &lt; d_2 &lt; \dots &lt; d_k</math>, <math>1 \leq k \leq 16</math>)</p> <p>XX80: <math>1 \leq d \leq 70</math> (<math>d_1 &lt; d_2 &lt; \dots &lt; d_k</math>, <math>1 \leq k \leq 16</math>)</p>
Default	[d]k = 0
Support modal	All the printers
Note	Set the Tab position:

	 <p>Set the Tab position d1 and d2</p> <p>The horizontal tab position is stored as a value of [character width n] measured from the beginning of the line. The character width includes the right-side character spacing, and double-width characters are set with twice the width of normal characters.</p> <p>This command cancels the previous horizontal tab settings.</p> <p>When setting n = 8, the print position is moved to column 9 by sending HT.</p> <p>Up to 16 tab positions (k = 16) can be set. Data exceeding 16 tab positions is processed as normal data.</p> <p>Transmit [n]k in ascending order and place a NUL code 0 at the end. When [n]k is less than or equal to the preceding value [n]k-1, tab setting is finished and the following data is processed as normal data.</p> <p>ESC D NUL cancels all horizontal tab positions.</p> <p>The previously specified horizontal tab positions do not change, even if the character width changes.</p> <p>The character width is memorized for each standard mode.</p>
For example	<pre>1B 40 1C 26 1B 44 10 18 00 B1 E0 BA C5 09 C3 FB B3 C6 09 BC DB B8 F1 28 D4 AA 29 0D 0A 1B 44 10 18 00 31 09 B0 D7 B2 CB 09 31 2E 35 0D 0A 1B 44 10 18 00 32 09 C7 D1 D7 D3 09 32 0D 0A 1B 44 10 18 00 33 09 B6 B9 D1 BF 09 31 0D 0A</pre>



**⑤ bar code command**

Select printing position for HRI characters

Name	Select printing position for HRI characters
Format	ASCII : GS H n Decimal : 29 72 n HEX : 1D 48 n
Description	Selects the printing position of HRI characters when printing a bar code. n



	selects the printing position as follows: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>n</th> <th>Printing position</th> </tr> </thead> <tbody> <tr> <td>0, 48</td> <td>Not printed</td> </tr> <tr> <td>1, 49</td> <td>Above the bar code</td> </tr> <tr> <td>2, 50</td> <td>Below the bar code</td> </tr> <tr> <td>3, 51</td> <td>Both above and below the bar code</td> </tr> </tbody> </table>	n	Printing position	0, 48	Not printed	1, 49	Above the bar code	2, 50	Below the bar code	3, 51	Both above and below the bar code
n	Printing position										
0, 48	Not printed										
1, 49	Above the bar code										
2, 50	Below the bar code										
3, 51	Both above and below the bar code										
Range	$0 \leq n \leq 3$ or $48 \leq n \leq 51$										
Default	$n = 0$										
Support modal	All the printers										
Note	ESC @,dump and restart,Reset the printer,This command setting failure.										
For example											

### Select bar code height

Name	Select bar code height
Format	ASCII : GS h n Decimal : 29 104 n HEX : 1D 68 n
Description	Selects the height of the bar code. n specifies the number of dots in the vertical direction. <div style="text-align: center; margin-top: 10px;">  height:50   height:100                 </div>
Range	$1 \leq n \leq 255$
Default	$n = 64$
Support modal	All the printers
Note	ESC @,dump and restart,Reset the printer,This command setting failure.
For example	

### Set bar code width

Name	Set bar code width
Format	ASCII : GS w n Decimal : 29 119 n HEX : 1D 77 n
Description	Set bar code width unit to n, Parameters n meaning as follow:

	 width:3  width:4
Range	$1 \leq n \leq 6$
Default	$n = 2$
Support modal	All the printers
Note	ESC @,dump and restart,Reset the printer,This command setting failure.
For example	

### Print bar code

Name	Print bar code
Format	<p>(A) ASCII : GS k m [d]k NUL            Decimal : 29 107 m [d]k NUL            HEX : 1D 6B m [d]k NUL</p> <p>(B) ASCII : GS k m n [d]k            Decimal : 29 107 m n [d]k            HEX : 1D 6B m n [d]k</p>
Description	<p>Selects a bar code system and prints the bar code.            m selects a bar code system as follows:</p>



<b>m</b>	<b>Bar Code System</b>	<b>Number of Characters</b>	<b>Remarks</b>	
①	0	UPC-A	$11 \leq k \leq 12$	$48 \leq d \leq 57$
	1	UPC-E	$11 \leq k \leq 12$	$48 \leq d \leq 57$
	2	JAN13 (EAN13)	$12 \leq k \leq 13$	$48 \leq d \leq 57$
	3	JAN 8 (EAN8)	$7 \leq k \leq 8$	$48 \leq d \leq 57$
	4	CODE39	$1 \leq k'$	$48 \leq d \leq 57, 65 \leq d \leq 90, 32, 36, 37, 43, 45, 46, 47$
	5	ITF	$1 \leq k$ (even number)	$48 \leq d \leq 57$
	6	CODABAR	$1 \leq k'$	$48 \leq d \leq 57, 65 \leq d \leq 68, 36, 43, 45, 46, 47, 58$
②	65	UPC-A	$11 \leq n \leq 12$	$48 \leq d \leq 57$
	66	UPC-E	$11 \leq n \leq 12$	$48 \leq d \leq 57$
	67	JAN13 (EAN13)	$12 \leq n \leq 13$	$48 \leq d \leq 57$
	68	JAN 8 (EAN8)	$7 \leq n \leq 8$	$48 \leq d \leq 57$
	69	CODE39	$1 \leq n \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 90, 32, 36, 37, 43, 45, 46, 47$
	70	ITF	$1 \leq n \leq 255$ (even number)	$48 \leq d \leq 57$
	71	CODABAR	$1 \leq n \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 68, 36, 43, 45, 46, 47, 58$
	72	CODE93	$1 \leq n \leq 255$	$0 \leq d \leq 127$
	73	CODE128	$2 \leq n \leq 255$	$0 \leq d \leq 127$

[Notes for ①]

This command ends with a NUL code.

When the bar code system used is UPC-A or UPC-E, the printer prints the bar code data after receiving 12 bytes of bar code data and processes the following data as normal data.

When the bar code system used is JAN13 (EAN13), the printer prints the bar code after receiving 13 bytes of bar code data and processes the following data as normal data.

When the bar code system used is JAN8 (EAN8), the printer prints the bar code after receiving 8 bytes of bar code data and processes the following data as normal data.

The number of data for the ITF bar code must be even numbers. When an odd number of bytes of data is input, the printer ignores the last

received data.

[Notes for ②]

n indicates the number of bar code data bytes, and the printer processes n bytes from the next character data as bar code data.

If n is outside the specified range, the printer stops command processing and processes the following data as normal data.

[Notes in standard mode]

If d is outside the specified range, the printer only feeds paper and processes the following data as normal data.

If the horizontal size exceeds printing area, the printer only feeds the paper.

This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by ESC 2 or ESC 3.

This command is enabled only when no data exists in the print buffer. When data exists in the print buffer, the printer processes the data following m as normal data.

After printing the bar code, this command sets the print position to the beginning of the line.

This command is not affected by print modes (emphasized, double-strike, underline, character size, white/black reverse printing, or 90° rotated character, etc.), except for upside-down printing mode.

[Example] Printing GS k 72 7 67 111 100 101 13 57 51

Control character			HRI character	Control character			HRI character
ASCII	Hex	Decimal		ASCII	Hex	Decimal	
NUL	00	0	■U	DEL	10	16	■P
SOH	01	1	■A	DC1	11	17	■Q
STX	02	2	■B	DC2	12	18	■R
ETX	03	3	■C	DC3	13	19	■S
EOT	04	4	■D	DC4	14	20	■T
ENQ	05	5	■E	NAK	15	21	■U
ACK	06	6	■F	SYN	16	22	■V
BEL	07	7	■G	ETB	17	23	■W
BS	08	8	■H	CAN	18	24	■X
HT	09	9	■I	EM	19	25	■Y
LF	0A	10	■J	SUB	1A	26	■Z
VT	0B	11	■K	ESC	1B	27	■A
FF	0C	12	■L	FS	1C	28	■B
CR	0D	13	■M	GS	1D	29	■C
SO	0E	14	■N	RS	1E	30	■D
SI	0F	15	■O	US	1F	31	■E
				DEL	7F	127	■T



When CODE128 (m = 73) is used:

When using CODE128 in this printer, take the following points into account for data transmission:

- ① The top of the bar code data string must be the code set selection character (CODE A, CODE B, or CODE C), which selects the first code set.
- ② Special characters are defined by combining two characters "{" and one character. The ASCII character "{" is defined by transmitting "{" twice consecutively.

Specific character	Transmit data		
	ASCII	Hex	Decimal
SHIFT	{S	7B, 53	123,83
CODE A	{A	7B, 41	123,65
CODE B	{B	7B,42	123,66
CODE C	{C	7B,43	123,67
FNC1	{1	7B,31	123,49
FNC2	{2	7B,32	123,50
FNC3	{3	7B,33	123,51
FNC4	{4	7B,34	123,52
"{"	{{	7B,7B	123,123

[Example] Example data for printing "No. 123456"

In this example, the printer first prints "No." using CODE B, then prints the following numbers using CODE C.

GS k 73 10 123 66 78 111 46 123 67 12 34 56



CODE 128:

1b 40 1d 48 02 1d 68 64 1d 77 03

1d 6b 49 0A 7B 42 4E 6F 2E 7B 43 0C 22 38

If the top of the bar code data is not the code set selection character, the printer stops command processing and processes the following data as normal data.

	<p>If the combination of "{" and the following character does not apply any special character, the printer stops command processing and processes the following data as normal data.</p> <p>If the printer receives characters that cannot be used in the special code set, the printer stops command processing and processes the following data as normal data.</p> <p>The printer does not print HRI characters that correspond to the shift characters or code set selection characters.</p> <p>HRI character for the function character is space.</p> <p>HRI characters for the control character (&lt;00&gt;H to &lt;1F&gt;H and &lt;7F&gt;H) are space.</p>
Range	(A) $0 \leq m \leq 6$ (B) $65 \leq m \leq 74$
Default	
Support modal	All the printers
Note	
For example	<pre> 1b 40 1d 48 02 1d 68 64 1d 77 03 30 0D 0A 1d 6b 00 30 31 32 33 34 35 36 37 38 39 31 00 31 0D 0A 1d 6b 01 30 31 32 33 34 35 36 37 38 39 31 00 32 0D0A 1d 6b 02 30 31 32 33 34 35 36 37 38 39 31 32 00 33 0D 0A 1d 6b 03 30 31 32 33 34 35 36 37 00 34 0D 0A 1D 6B 04 30 31 32 41 42 20 24 25 2B 2D 2E 2F 00 35 0D 0A 1d 6b 05 30 31 32 33 34 35 36 37 38 39 31 32 00 36 0D 0A 1d 6b 06 2D 31 32 42 24 2B 2D 2E 00 1d 6b 06 43 31 32 33 34 35 36 34 38 39 00  36 35 0D 0A 1d 6b 41 0c 31 32 33 34 35 36 37 38 39 30 31 32 36 36 0D 0A 1d 6b 42 0c 30 32 33 34 35 36 30 30 30 30 38 39 36 37 0D 0A 1d 6b 43 0c 30 32 33 34 35 36 30 30 30 30 38 39 36 38 0D 0A 1d 6b 44 08 30 32 33 34 35 36 30 30 36 39 20 20 4e 4f 20 24 25 2b 2d 2e 2f 31 32 33 34 35 36 30 30 0D 0A 1d 6b 45 11 4e 4f 20 24 25 2b 2d 2e 2f 31 32 33 34 35 36 30 30 </pre>

	<p>37 30 20 20 20 30 32 33 34 35 36 30 30 C5 BC CA FD 0D 0A</p> <p>1d 6b 46 09 30 31 32 33 34 35 36 30 30</p> <p>37 31 0d 0a</p> <p>1d 6b 47 05 32 33 34 35 36</p> <p>37 32 0d 0a</p> <p>1d 6b 48 0b 32 33 34 35 36 41 42 2e 2f 2b 2c</p> <p>37 33 0d0a</p> <p>1d 6b 49 0A 7B 42 4E 6F 2E 7B 43 0C 22 38</p>
--	--

## ⑥QR CODE COMMAND

### Set the model type

Name	Set the model type
Format	<p>ASCII : GS ( k pL pH cn fn n</p> <p>Decimal : 29 40 107 pL pH cn fn n</p> <p>HEX : 1D 28 6b pL pH cn fn n</p>
Description	Set the model type
Range	<p>pL=3, pH=0</p> <p>cn=49</p> <p>fn=67</p> <p><math>0 \leq n \leq 16</math></p>
Default	n=3
Support modal	All the printers
Note	Set the QR code size of the smallest unit of graphics module[n dots× n dots].
For example	

### Set the QR code error correction level error (ECC)

Name	Set the QR code error correction level error (ECC)
Format	<p>ASCII : GS ( k pL pH cn fn n</p> <p>Decimal : 29 40 107 pL pH cn fn n</p> <p>HEX : 1D 28 6b pL pH cn fn n</p>
Description	Set the QR code error correction level error
Range	<p>pL=3, pH=0</p> <p>cn=49</p> <p>fn=69</p> <p><math>48 \leq n \leq 51</math></p>
Default	n=48
Support modal	All the printers
Note	Set the QR code error correction level error

	n	function	The general proportion of recovery (%)
	48	Error correction level L	7
	49	Error correction level m	15
	50	Error correction level q	25
	51	Error correction level h	30
For example			

### Set the QR code graphic data

Name	Set the QR code graphic data
Format	ASCII : GS ( k pL pH cn fn m d1...dk Decimal : 29 40 107 pL pH cn fn m d1...dk HEX : 1D 28 6b pL pH cn fn m d1...dk
Description	Set the QR code graphic data.
Range	$4 \leq (pL + pH \times 256) \leq 7092$ ( $0 \leq pL \leq 255, 0 \leq pH \leq 28$ ) cn=49 fn=80 m=48 $0 \leq d \leq 255$ $k = (pL + pH \times 256) - 3$
Default	
Support modal	All the printers
Note	Set the QR code graphic data(d1...dk)to QR code buffer. (d1...dk) ( (pL +pH×256 )-3 ) Byte as a graphic data is processed.
For example	

### Print store QR codes graphics

Name	Print store QR codes graphics
Format	ASCII : GS ( k pL pH cn fn m Decimal : 29 40 107 pL pH cn fn m HEX : 1D 28 6b pL pH cn fn m
Description	Print store QR codes graphics
Range	pL=3, pH=0 cn=49 fn=81 m=48
Default	
Support modal	All the printers
Note	Print store QR codes graphics. The user must consider QR code graphic space (QR code graphics about spacing and the spacing of up and down) .
For example	1b 40

	1d 28 6b 03 00 31 43 03
	1d 28 6b 03 00 31 45 30
	1d 28 6b 06 00 31 50 30 41 42 43
	1b 61 01
	1d 28 6b 03 00 31 52 30
	1d 28 6b 03 00 31 51 30

## ⑦ STATUS COMMAND

### Transmit status

Name	Transmit status									
Format	ASCII : GS r n Decimal : 29 114 n HEX : 1D 72 n									
Description	Transmits the status specified by n as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">n</th> <th style="width: 50%;">Function</th> </tr> </thead> <tbody> <tr> <td>1.49</td> <td>Transmits paper sensor status</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>		n	Function	1.49	Transmits paper sensor status				
n	Function									
1.49	Transmits paper sensor status									
Range	n = 1, 49									
Default										
Support modal	All the printers									

Note	<ul style="list-style-type: none"> <li>•When using a serial interface When DTR/DSR control is selected, the printer transmits only 1 byte after confirming the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready. When XON/XOFF control is selected, the printer transmits only 1 byte without confirming the condition of the DSR signal.</li> <li>•This command is executed when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receive buffer status.</li> <li>•When Auto Status Back (ASB) is enabled using GS a, the status transmitted by GS r and the ASB status must be differentiated using.</li> <li>•The status types to be transmitted are shown below:</li> </ul>				
	<b>Bit</b>	<b>Off/On</b>	<b>Hex</b>	<b>Decimal</b>	<b>Status for ASB</b>
	0,1	-	-	-	Undefined.
	2,3	Off	00	0	Paper roll end sensor: paper adequate.
		On	(0C)	(12)	Paper roll end sensor: paper near end.
	4	Off	00	0	Not used. Fixed to Off.
	5,6	-	-	-	Undefined.
	7	Off	00	0	Not used. Fixed to Off.
	Paper sensor status (n = 1, 49):				
	Bits 2 and 3: When the paper end sensor detects a paper end, the printer goes offline and does not execute this command. Therefore, bits 2 and 3 do not transmit the status of paper end.				
For example					

### Real-time transmission status

Name	Real-time transmission status
Format	ASCII : DLE EOT n Decimal : 16 4 n HEX : 10 04 n
Description	n = 1: printer status n = 2: send offline status n = 3: Transmission error status n = 4: Transmission paper sensor status
Range	$1 \leq n \leq 4$
Default	
Support modal	All the printers



Note	n=1: printer status				
	bit	0/1	HEX	Decimal	Function
	0	0	00	0	0
	1	1	02	2	1
	2	0	00	0	Open one or two cash drawer (No cash drawer is fixed to 0)
		1	04	4	Close cash drawer
	3	0	00	0	On-line
		1	08	8	Off-line
	4	1	10	16	1
	5, 6		--	--	Undefined
	7	0	00	00	The paper has been torn away
		1	80	96	Paper not to tear away
	n=2: send offline status				
	位	0/1	HEX	Decimal	function
	0	0	00	0	0
	1	1	02	2	1
	2	0	00	0	Close paper warehouse
		1	04	4	Open paper warehouse
	3	0	00	0	Not push Feed button
		1	08	8	Push feed button
	4	1	10	16	1
	5	0	00	0	Paper normal
		1	20	32	Paper out
	6	0	00	00	Normal status
		1	40	64	Error status
	7	0	00	0	0
	n=3: Transmission error status				
	bit	0/1	HEX	Decimal	function
	0	0	00	0	0
	1	1	02	2	1
	2		--	--	Undefined
	3	0	00	0	cutter normal
		1	08	8	Cutter error
4	1	10	16	1	
5	0	00	0	Unrecoverable Error	
	1	20	32	Unrecoverable Error	
6	0	00	00	Print head temperature and voltage are normal	

		1	40	64	Print head temperature and voltage are over range.	
	7	0	00	0	0	
	n=4: Transmission paper sensor status					
		bit	0/1	HEX	Decimal	Function
		0	0	00	0	0
		1	1	02	2	1
		2,	0	00	0	normal status
		3	1	0C	12	paper will out
		4	1	10	16	1
		5,	0	00	0	normal status
	6	1	60	96	Paper out	
	7	0	00	0	0	
For example	10 04 01 10 04 02 10 04 03 10 04 04					

### Enable/Disable Automatic Status Back (ASB)

Name	Enable/Disable Automatic Status Back (ASB)				
Format	ASCII : GS a n Decimal : 29 97 n HEX : 1d 61 n				
Description	When ASB is enabled, the printer will send the changed status to PC automatically.				
	bit	off/on	HEX	Decimal	ASB status
	0	-	-	-	Undefined
	1	-	-	-	Undefined
	2	off	00	0	error status prohibition
	on	04	4	Error status allows	

	3	off	00	0	Paper sensor status prohibition
		on	08	8	Paper sensor status allows
	4-7	-	-	-	Undefined
Range	0 ≤ n ≤ 255				
Default					
Support modal	All the printers				
Note					
For example	1D 61 08				

## ⑧ Other command

### Initialize printer

Name	Initialize printer
Format	ASCII : ESC @ Decimal : 27 64 HEX : 1B 40
Description	Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.
Range	
Default	
Support modal	All the printers
Note	
For example	

### Printing test paper

Name	Printing test paper
Format	ASCII : DC2 T Decimal : 18 94 HEX : 12 54
Description	Printing test page
Range	
Default	
Support modal	All the printers
Note	
For example	1B 40 12 54

### Set the print concentration

Name	Set the print concentration
Format	ASCII : ESC 7n1n2 n3 Decimal : 27 55 n1 n2 n3 HEX : 1B 37 n1 n2 n3

Description	<p>Set “max heating dots”, “heating time”, “heating interval” ;</p> <ul style="list-style-type: none"> <li>• n1 = 0-255 Max printing dots, Unit(8dots), Default:9(80 dots);</li> <li>• n2 = 3-255 Heating time, Unit(10us),Default:80(800us);</li> <li>• n3 = 0-255 Heating interval,Unit(10us), Default:2(20us);</li> </ul> <p>The more max heating dots, the more peak current will cost whenprinting, the faster printing speed. The max heating dots is <math>8*(n1+1)</math>;</p> <p>The more heating time, the more density , but the slower printing speed. If heating time is too short, blank page may occur.</p> <p>The more heating interval, the more clear, but the slower printingspeed.</p>
Range	
Default	
Support modal	All the printers
Note	‘heating time’、’heating interval’PCB will automatically adjust according to the input voltage
For example	<p>Heating dots: 80dots, heating time: 800us, heating interval: 20us。</p> <p>1B 40 1B 37 09 50 02 12 54</p> <p>Heating dots: 80dot, heating time: 1600us, heating interval: 20us。</p> <p>1B 40 1B 37 09 A0 02 12 54</p> <p>It is observed that the more heating time,the more printing dark.</p>