



ZYTP58-Lxxx Series

58mm Micro-thermal Printer Control Module

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Chapter 1: Product Introduction

ZYTP58-Lxxx is a Micro-thermal printer control module developed by Guangzhou ZLGMCU Development Co., Ltd. This module is featured with compact size and easy-to-use, enabling developers to complete their product development in a short time. It is an ideal choice for 58mm thermal printer controlling applications.

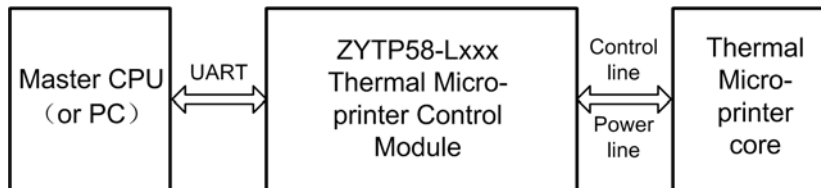


Figure 1-1: How to use ZYTP58-Lxxx

Figure 1-1 demonstrates how to use the ZYTP58-Lxxx series Micro-thermal printer control module:

- The Master CPU controls the ZYTP58-Lxxx through UART;
- ZYTP58-Lxxx drives the Micro-thermal Printer Core for printing by controlling the control line and the power line, as Figure 1-1 shows.

ZYTP58-Lxxx has an utmost low consumption, and can provide several specific functions, such as input voltage detection, printing voltage control, over temperature protection and paper-end detection, making its application more flexible and reliable. Figure 1-2 shows the appearance of ZYTP58-Lxxx.



Figure 1-2 ZYTP58-Lxxx

1.1 Applications

- Instrument;
- Supermarket;
- Convenient Store;
- Post Office;
- Bank;
- Public Utility Meter Reading System;

- M-Police System;
- M- Government System;
- Medical Instrument;
- Handheld Device;
- Tobacco Monopoly.

1.2 Features

The features of ZYTP58-Lxxx include:

- Compatible with a large range of printer core, such as ZLG ZTP481, SEIKO LTP1245, SEIKO LTPD245, SEIKO LTPH245 and so on;
- Utmost low consumption mode: 10 μ A only (TTL serial port);
- Subminiature chip encapsulation for embedded applications, physical dimension: 31.8mm(width) \times 20.3mm(depth) \times 6.5mm(height);
- Support wide printing voltage range: 3.5~8.5V, and provide automatic configuration to the printing speed (70mm/s maximum) based on the printing voltage;
- Adjustable printing color density for different requirements;
- Support double width, double height, emphasized, italic, inverse, border and underline settings for printing;
- Support vertical table printing with a flexible and diverse form, very suitable for multiple table items printing;
- Support one-dimension bar code, such as EAN13, EAN8, UPCA, UPCE, CODE39, ITF25, CODABAR, CODE93, CODE128, EAN128 and so on;
- Support common ESC/POS control command;
- Serial communication interface (RS-232C/TTL), support RTS/CTS and Xon/Xoff protocols.

1.3 Naming convention

Figure 1-3 shows the product naming convention.

Example: ZYTP58-LT6B

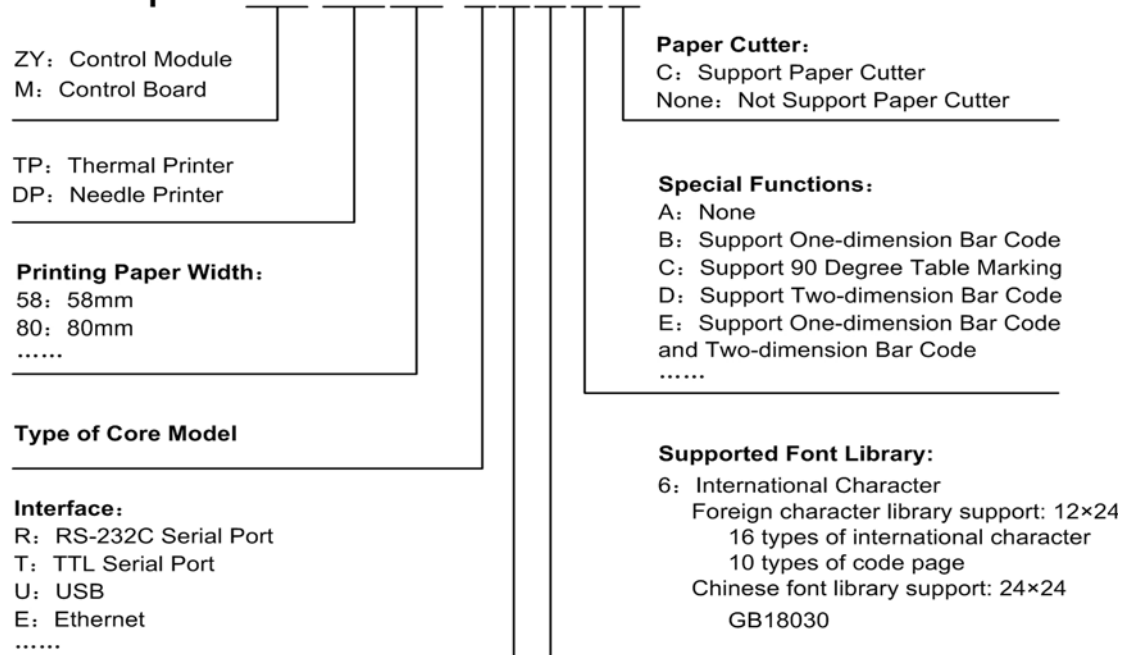


Figure 1-3: Product Naming Convention

1.4 Product List

Table 1-1: Product list of ZYTP58-Lxxx Series

Type	Serial Level	Specific Functions	Package
ZYTP58-LT6B	TTL	Support one-dimension bar code, international character, code page	DIP-24PIN
ZYTP58-LR6B	RS-232C	Support one-dimension bar code, international character, code page	DIP-24PIN

Notes: The devices listed above can also be customized to support different type of printer cores with special functions.

Chapter 2: Pin Information

Figure 2-1 shows the pin assignment of ZYTP58-Lxxx series, and Table 2-1 lists its pin definitions.

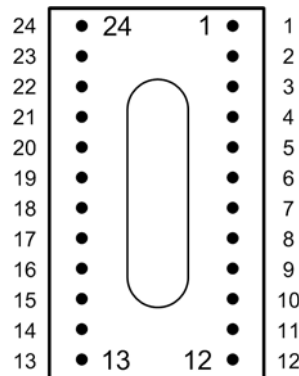


Figure 2-1: Pin Assignments

Table 2-1: Pin Definition

Pin	No.	I/O	Type	Description
PHK	1	Output	Core interface	Paper-end sensor photo-diode negative pole ^[1]
PAPER-OUT	2	Output	Core interface	Paper-end sensor signal (Low for paper end) ^[1]
NC	3	—	—	No connection (must be disconnected)
DI	4	Output	Core interface	Serial data
CLK	5	Output	Core interface	Serial clock
STB2	6	Input	Core interface	Heating control line 2
VDD	7	Output	Core interface	Chip logic power supply with 3.3V output voltage; it can drive the LEDs for power supply indicating or low power mode indicating. For normal mode, this pin outputs 3.3V voltage; for low power case, this pin outputs 0V voltage ^[2]
TM	8	Input	Core interface	Temperature measuring
STB1	9	Output	Core interface	Heating control line 1
LATCH	10	Output	Core interface	Serial data latch
VH	11	Output	Core interface	Power supply for heating
NC	12	—	—	No connection (must be disconnected)
VIN	13	—	User Interface	Power supply input
GND	14	—	—	Ground
MT-B-	15	Output	Core interface	Step motor/B ^[3]
MT-B+	16	Output	Core interface	Step motor B ^[3]
MT-A-	17	Output	Core interface	Step motor/A ^[3]
MT-A+	18	Output	Core interface	Step motor A ^[3]
NC	19	—	—	No connection (must be disconnected)

Pin	No.	I/O	Type	Description	
KEY	20	—	—	Feed paper button and test page printing button (press the button and hold, then power on the machine, test page printing will be performed) ^[4]	
LED	21			This pin can be connected to state indicator to indicate the working statue of the printer ^[4]	
				Always on: normal working;	
				Blinking in 1MHz: the power supply voltage is over 8.5V;	
				Blinking in 2MHz: paper end;	
				Blinking in 4MHz: over temperature	
BUSY	22	Output	User Interface	RTS/CTS flow control indicator	
				BUSY is logic "1" ^[5]	The printer is busy, no data will be received.
				BUSY is logic "0" ^[5]	The printer is ready to receive data.
RXD	25	Output	User Interface	Serial interface sending	
TXD	26	Input	User Interface	Serial interface receiving	

Notes: [1] The printer core that supported by ZYTP58-Lxxx contains a paper-end detection sensor and a platen open detection sensor, as Figure 2-3 shows.

[2] Mustn't to drive the periphery with large current, otherwise unpredictable result may occur.

[3] The printer core that supported by ZYTP58-Lxxx should meet the requirement of the driving timing of the feed paper motor shown in Figure 2-2.

[4] The LED and KEY pins internal connection circuit is shown as Figure 3-1.

[5] RS-232 level is a negative logic level. When the BUSY pin outputs logic "1", the TTL level BUSY pin would output High level, while the RS-232 BUSY pin would output Low level.

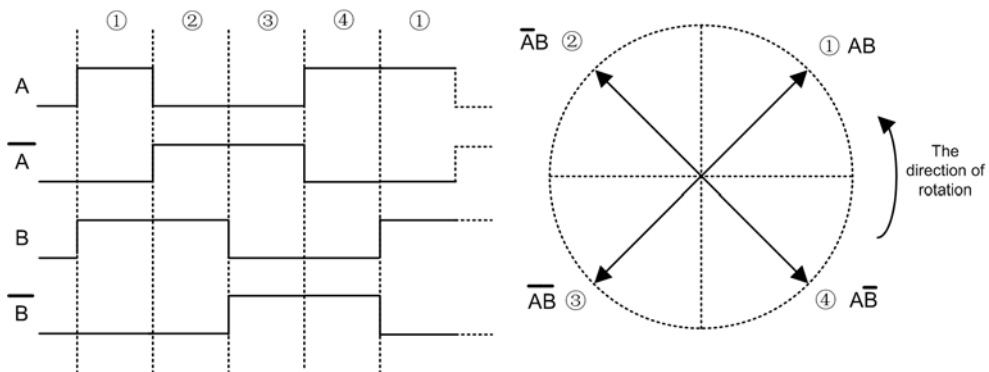


Figure 2-2: motor driving timing for paper feeding

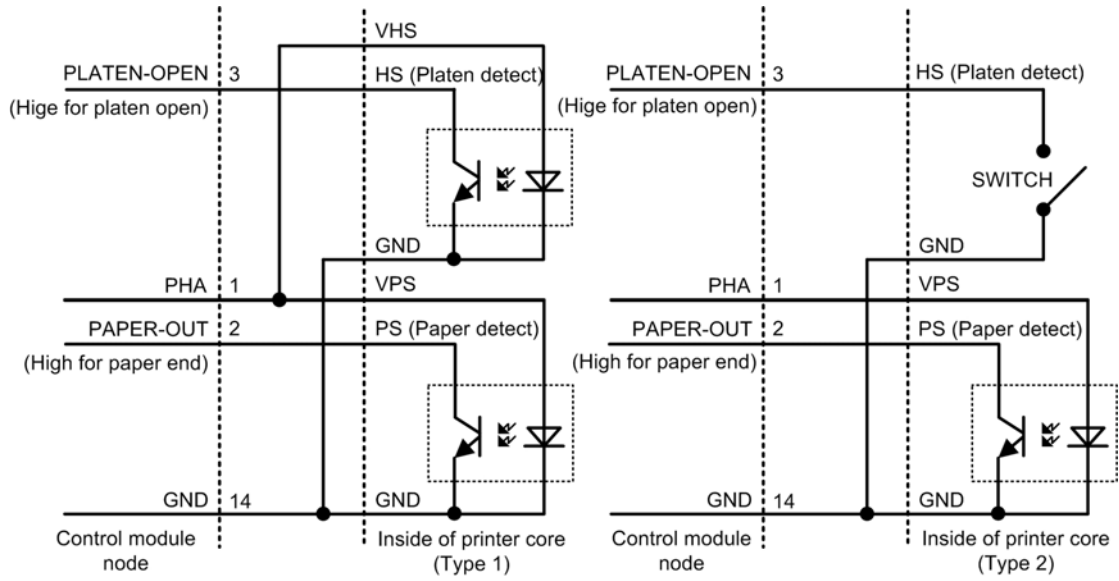


Figure 2-3: Paper-end detection and Platen open detection sensor

Chapter 3: Typical Application Circuit

Figure 3-1 shows the typical application circuit of the ZYTP58-LTxx micro-thermal printer control module, in which the printer core is ZTP486F-H101/L101 from Guangzhou ZLGMCU Development Co., Ltd.

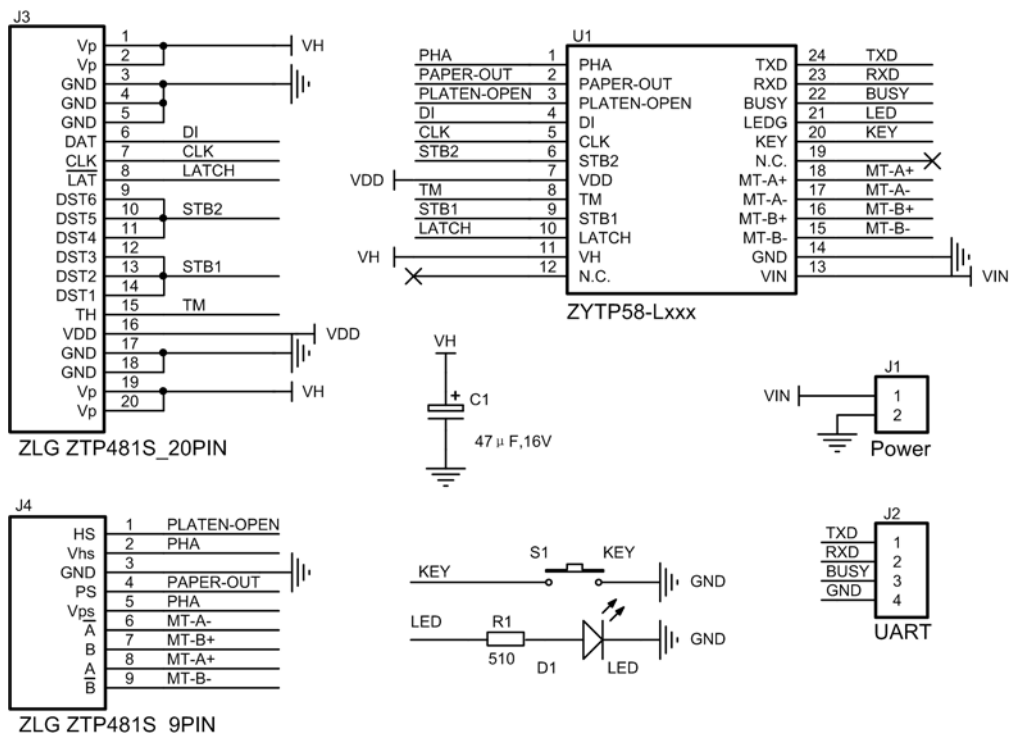


Figure 3-1: ZYTP58-Lxxx typical application circuit

Chapter 4: Technical Specification

The technical specification of ZYTP58-Lxxx is shown in Table 4-1.

Table 4-1: Technical Specification

Printing Mode	Thermal line printing
Printing Density	8dots/mm
Printing Dots per Line	384dots/line
Printing Width	48mm
Paper Width	57±1mm
Printing Rate	70mm/sec maximum ^[1]
Printing Character	Foreign character library support: 12×24 16 types of international character 10 types of code page Chinese font library support: 24×24 GB18030
Printing Image	Vertical modulus image printing: 8 dots single density; 8 dots double density; 24 dots single density; 24 dots double density.
	Horizontal modulus image printing
One-dimension Bar Code	Support 10 types of common one-dimension bar code: UPCA, UPCE, EAN13, EAN8, CODE39, ITF25, CODABAR, CODE93, CODE128 and EAN128
Two-dimension Bar Code	Not supported
Communication Interface	Standard UART interface (support RS-232 level or TTL level) After power up, the serial communication parameters will be set to baud rate: 9600bps, none parity, 8 data bits and 1 stop bit by default. User can also modify these communication parameters by using “GS (E” command, for more information, please refer to “ZLG ESC/POS Application Guide”.
	Support RTS/CTS and Xon/Xoff protocol
Input Buffer	2K Bytes
Platen Open Detection	Not supported
Paper End Detection	Support
Over Temperature Protection	Support
Paper Cutter	Not supported
Power Supply	DC 3.5~8.5V/3A (DC 7.2/3A is recommended)
Physical Size	31.8×20.3×6.5 (mm)

Chapter 5: Electrical Parameters

The electrical parameters of ZYTP58-Lxxx are listed in Table 5-1.

Table 5-1: Electrical Parameters

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Voltage (input)		V_{IN}	$T_O=25^{\circ}C$	3.5	7.2	8.5	V
Operating Current (input)	Working Current	I_W	Printing Density 12.5%	–	1.4	3.8	A
	Static Current	I_S	$V_{IN}=8.5V$	–	20	–	mA
	Low Power	V_{LP}	TTL Module	–	10	–	μA
Printing Voltage (Output)		V_H		–	$=V_{IN}$	–	V
Printing Current (Output)		I_H		–	–	3.7	A
Logic Voltage (Output)		V_{DD}	$I_{DD}=10mA$	3.3-5%	3.3	3.3+5%	V
Logic Current (Output)		I_{DD}	$V_{IN}=3.5V$	–	–	80	mA
Logic Level Voltage (Input)	High	V_{IH}	V_{DD} Output 3.3V	$0.7V_{DD}$	–	5	V
	Low	V_{IL}	V_{DD} Output 3.3V	–	–	$0.3V_{DD}$	V
Logic Level Voltage (Output)	High	V_{OH}	V_{DD} Output 3.3V	$V_{DD}-0.4$	–	–	V
	Low	V_{OL}	V_{DD} Output 3.3V	–	–	0.4	V
Logic Level Input Current	High	I_{IH}	V_{DD} Output 3.3V	–	0.5	10	nA
	Low	I_{IL}	V_{DD} Output 3.3V	–	0.5	10	nA
Logic Level Output Current	High	I_{OH}	V_{DD} Output 3.3V	4	–	–	mA
	Low	I_{OL}	V_{DD} Output 3.3V	4	–	–	mA
Clock Frequency		F_{CLK}		–	6	–	MHz
Motor Driver Current		I_M	Connect to ZLG ZTP486F printer core $V_{IN}=8.5V$	–	0.4	–	A
RS-232 Level Serial Port Parameters	Output Voltage	V_{O-UART}	$T_O=25^{\circ}C$ Load=3k Ω	± 5.0	± 5.4	–	V
	Output Impedance	R_{O-UART}		300	–	–	Ω
	Output Short-circuit Current	$I_{OSC-UART}$	$V_{OUT} = 0V$	–	± 35	± 60	mA
	Output Leakage Current	$I_{OLC-UART}$		–	–	± 25	μA

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	V_{I-UART}		-15	-	+15	V
Low Input Voltage Threshold	$V_{IL-UART}$		0.6	1.2	-	V
High Input Voltage Threshold	$V_{IH-UART}$		-	1.5	2.4	V
Input Impedance	R_{I-UART}		3	5	7	k Ω
Operating Temperature	T_O		-40	-	+85	$^{\circ}\text{C}$
Storage Temperature	T_S		-50	-	+125	$^{\circ}\text{C}$
Jointing Temperature	T_J				250	$^{\circ}\text{C}$
Jointing Endurance	t_J				3	s

Chapter 6: Physical Size

The physical size of the control board within the ZYTP58-Lxxx is shown in Figure 6-1. And Table 6-1 lists the corresponding parameters.

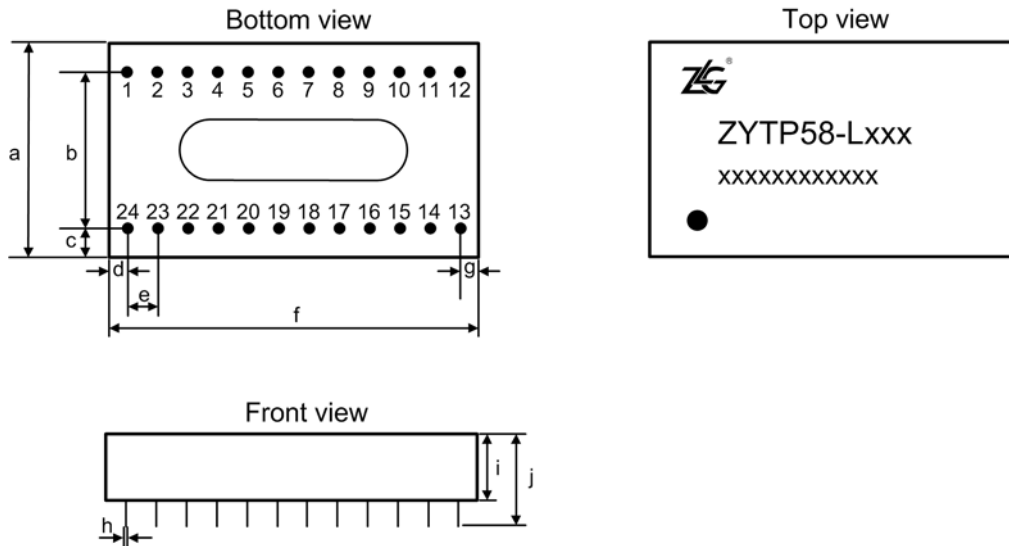


Figure 6-1: The physical size of the control board

Table 6-1: Physical size parameter

Legend	Mark	Inch	Unit: mm
Bottom view diagram	a	0.799	20.30
	b	0.600	15.24
	c	0.100	2.54
	d	0.076	1.93
	e	0.100	2.54
	f	1.252	31.80
	g	0.076	1.93
Top view diagram	h	0.019	0.48
	i	0.256	6.50
	j	0.420	10.68

Chapter 7: ESC/POS command

The ESC/POS commands supported by ZYTP58-Lxxx are listed in Table 7-1.

Table 7-1: ESC/POS command

Command	Function	Command Type ^[1]
LF	Print and feed paper	Print and feed commands
CR	Carriage return	
ESC J	Print and feed paper for n dots	
ESC K	Print and feed paper back for n dots	
ESC d	Print and feed paper for n lines	
ESC e	Print and feed paper back for n lines	
ESC 3	Set the line space to n dots	Print setting commands
ESC 2	Set the line space to a default value	
ESC 1	Set the left margin	
ESC Q	Set the right margin	
ESC \$	Set the absolute print position	
ESC !	Set the font types	
ESC a	Set the print alignment	
ESC m	Set the font grayscale	
FS s	Set the print speed	
ESC M	Set the font size	
FS !	Select print mode(s) for Kanji characters	
FS .	Cancel Kanji character mode	
ESC R	Select an international character set	
ESC t	Select character code page	
ESC*	Select bit-image mode	Image print commands
GS v 0	Print raster bit image	Tabulation commands
HT	Horizontal tab	
ESC D	Set horizontal tab positions	One-dimension /two-dimension bar code print commands
GS H	select print position of one-dimension HRI	
GS h	Set the height of one-dimension bar code	
GS w	Set the width of one-dimension bar code	
GS f	Select font size for one-dimension bar code	
GS k	Print one-dimension bar code	
DLE EOT	Query the states of printer (real-time)	States commands
GS a	Set/cancel the printer states automatic back	Miscellaneous commands
ESC @	Initialize the printer	
DLE DC4 8	Clear the printer buffer (real-time)	
GS (E	Set the configuration item for the serial interface	

DLE DC4 2	Enter/Exit low power mode (real-time)	
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Notes: [1] For more information, please refer to "ZLG ESC POS Application Guide".

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