



MTP58-Fx6B Series

58mm Micro-thermal Printer Control Board

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Chapter 1: Product Introduction

MTP58-Fx6B is a Micro-thermal printer control board developed by Guangzhou ZLGMCU Development Co., Ltd. This control board 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.

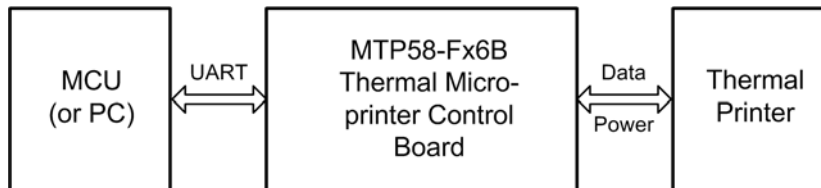


Figure 1-1: How to use MTP58-Fx6B

Figure 1-1 demonstrates how to use the MTP58-Fx6B series Micro-thermal printer control board:

- The MCU communicate with the MTP58-Fx6B through UART;
- MTP58-Fx6B drives the Micro-thermal Printer head for printing by controlling the control line and the power line, as Figure 1-1 shows.

MTP58-Fx6B 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 MTP58-Fx6B.



Figure 1-2 MTP58-Fx6B

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 MTP58-Fx6B include:

- Compatible with Printer Head, ZLG ZTP486F-H101/L101, Fujitsu FTP-628MCL101;
- Utmost low consumption mode: 10 μ A only (TTL serial port);
- Subminiature chip encapsulation for embedded applications, physical dimension: 57mm(width) \times 33mm(depth) \times 10mm(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: MTP58-FT6B

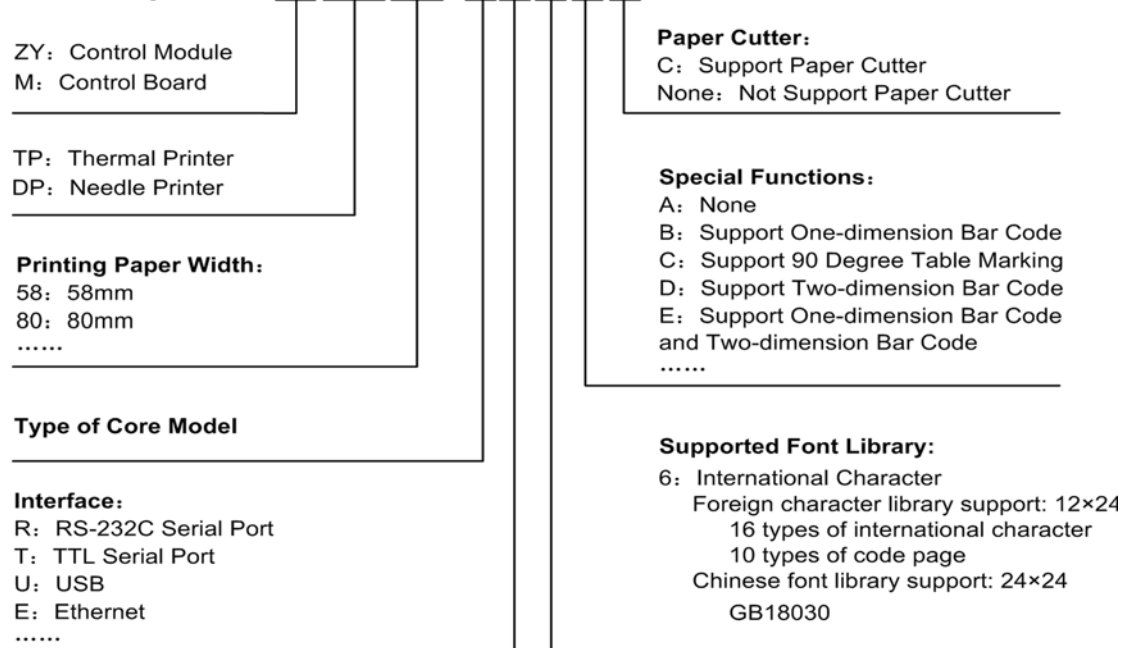


Figure 1-3: Product Naming Convention

1.4 Product List

Table 1-1: Product list of MTP58-Fx6B Series

Type	Serial Level	Specific Functions
MTP58-FT6B	TTL	Support one-dimension bar code, international character, code page
MTP58-FR6B	RS-232C	Support one-dimension bar code, international character, code page

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

Chapter 2: Interface Information

Figure 2-1 shows the Interface assignment of MTP58-Fx6B series, and Table 2-1 lists its Interface definitions.

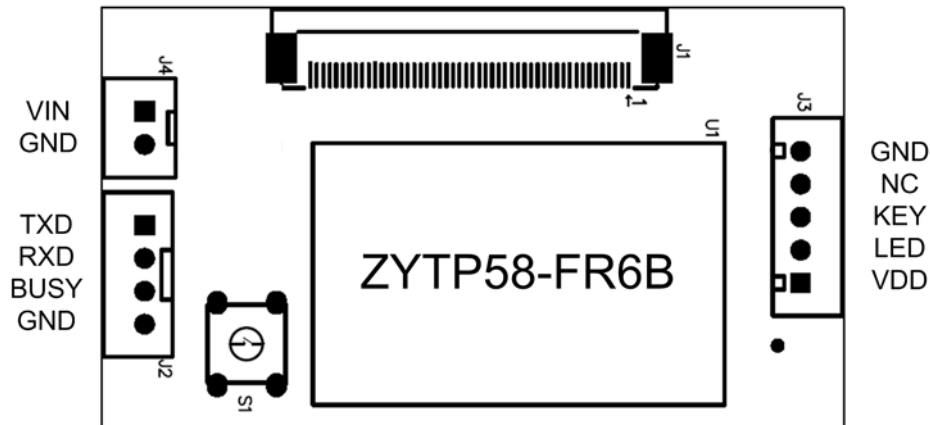


Figure 2-1: Interface Assignments

Table 2-1: Interface Definition

Interface	Part	I/O	Type	Description	
VIN	J4	—	User Interface	Power supply input	
GND		—	—	Ground	
TXD	J2	Input	User Interface	Serial interface receiving	
RXD		Output	User Interface	Serial interface sending	
BUSY		Output	User Interface	RTS/CTS flow control indicator	
				BUSY is logic "1" ^[3]	The printer is busy, no data will be received.
				BUSY is logic "0" ^[3]	The printer is ready to receive data.
GND	J3	—	—	Ground	
GND		—	—	Ground	
NC		—	—	No connection (must be disconnected)	
KEY		—	—	Feed paper button and test page printing button (press the button and hold, then power on the machine, test page printing will be performed) ^[2]	
LED		—	—	This pin can be connected to state indicator to indicate the working statue of the printer ^[2]	
				Always on: normal working;	
				Blinking in 1MHz: the power supply voltage is over 8.5V;	
				Blinking in 2MHz: paper end;	

Interface	Part	I/O	Type	Description
				Blinking in 4MHz: over temperature
VDD		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 ^[1]

Notes: [1] Mustn't to drive the periphery with large current, otherwise unpredictable result may occur.

[2] The LED and KEY pins internal connection circuit is shown as Figure 2-2.

[3] 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.

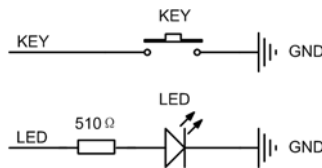


Figure 2-2: Interface Assignments

Chapter 3: Technical Specification

The technical specification of MTP58-Fx6B is shown in Table 3-1.

Table 3-1: 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 4: Electrical Parameters

The electrical parameters of MTP58-Fx6B are listed in Table 4-1.

Table 4-1: Electrical Parameters

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Operating Voltage (input)		V_{IN}	$T_0=25^{\circ}\text{C}$	4.5	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	$V_{IN}=8.5\text{V}$	–	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}	$I_{DD}=10\text{mA}$	3.3-5%	3.3	3.3+5%	V
Logic Current (Output)		I_{DD}	$V_{IN}=3.5\text{V}$	–	–	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-H101 printer head $V_{IN}=7.2\text{V}$	–	0.4	–	A
RS-232 Level Serial Port Parameters	Output Voltage	V_{O-UART}	$T_0=25^{\circ}\text{C}$ Load=3k Ω	± 5.0	± 5.4	–	V
	Output Impedance	R_{O-UART}		300	–	–	Ω
	Output Short-circuit Current	$I_{OSC-UART}$	$V_{OUT}=0\text{V}$	–	± 35	± 60	mA
	Output Leakage	$I_{OLC-UART}$		–	–	± 25	μA

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Current						
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 5: Physical Size

The physical size of the control board within the MTP58-Fx6B is shown in Figure 5-1. And Table 5-1 lists the corresponding parameters.

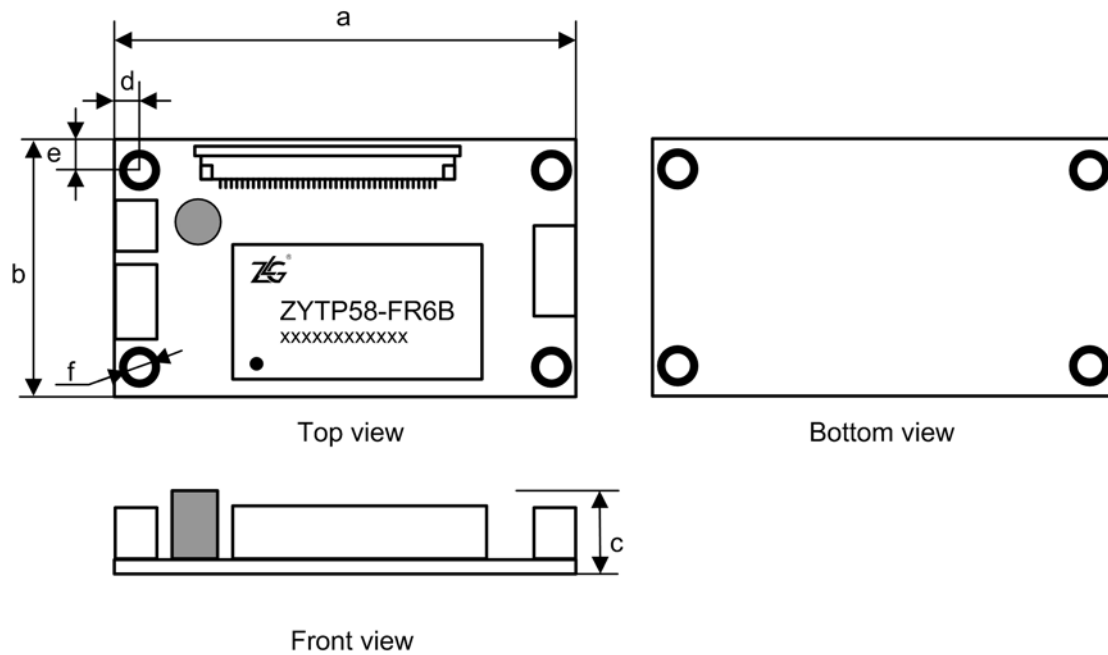


Figure 5-1: The physical size of the control board

Table 5-1: Physical size parameter

Legend	Mark	Inch	Unit: mm
Top view diagram	a	2.250	57.15
	b	1.275	32.39
	c	0.393	10.00
	d	0.100	2.54
	e	0.100	2.54
	f	0.100	2.54

Chapter 6: ESC/POS command

The ESC/POS commands supported by MTP58-Fx6B are listed in Table 6-1.

Table 6-1: 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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