User Manual

MTP58-FTxx-T1

Evaluation Board for the Micro-Thermal Printer

Item	Contents
Terms	MTP58-FTxx-T1, Evaluation Board, Micro-Thermal, Label Printing, 58mm
Abstract	Guangzhou ZLGMCU Technology Co., Ltd. developed several types of Micro-Thermal Printer. They are fully functional, and can support more than thirty common ESC/POS instructions. And the corresponding evaluation boards are also provided for evaluation test, enabling customers to complete their product development in a short time and make their products more competitive in the market. This document describes the MTP58-FTxx-T1 evaluation board.

Revision History

Version	Rev. Date	Modifications
V1.00	2010-07-13	Original version

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Contents

Chapter 1: Introduction

The MTP58-FTxx-T1 is a dedicated evaluation board of the MTP58-FTxx Micro-Thermal printer control board. Figure 1-1 shows the appearance of this product. MTP58-FTxx-T1 supports ZLG ZTP486F-H101/L101 (compatible with Fujitsu FTP-628MCL101 printer core), and provides USB, RS-232C interface, and TTL level UART interface and blue teeth communication mode. The input voltage of it is 9~26V/3A DC.

Figure 1-1: The appearance of the MTP58-FTxx-T1

Chapter 2: Hardware Description

The MTP58-FTxx-T1 contains 10 components, as Figure 2-1 and Figure 2-2 shows. And the description of each functional component is shown in Table 2-1.

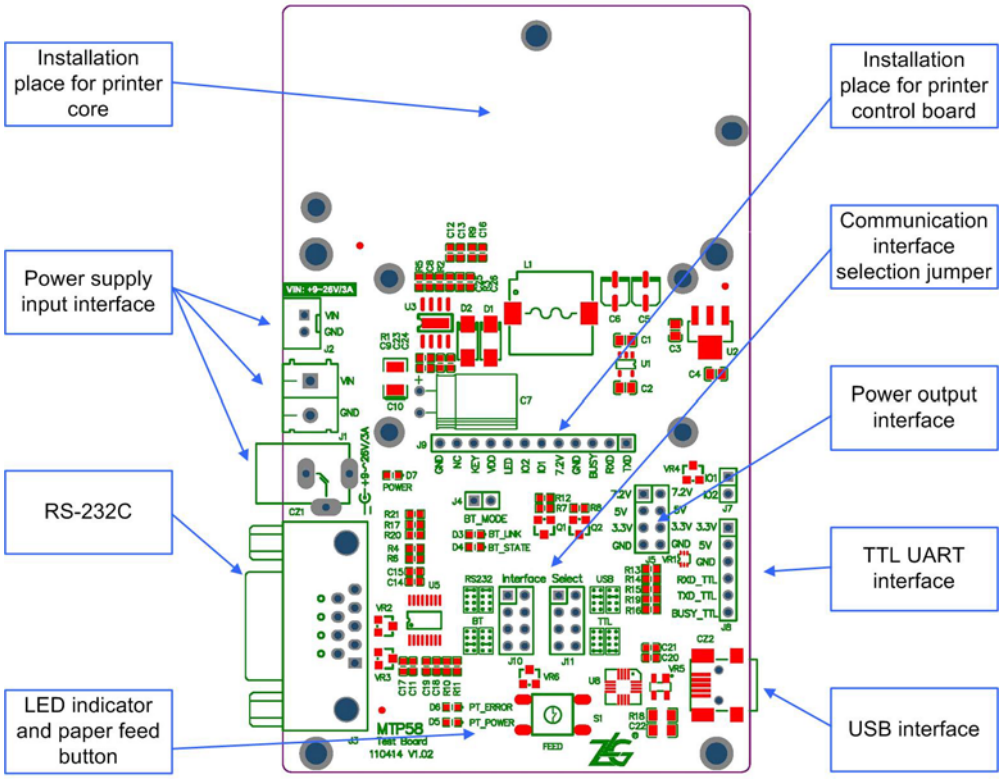

Figure 2-1: The front PCB silk screen of MTP58-FTxx-T1 evaluation board

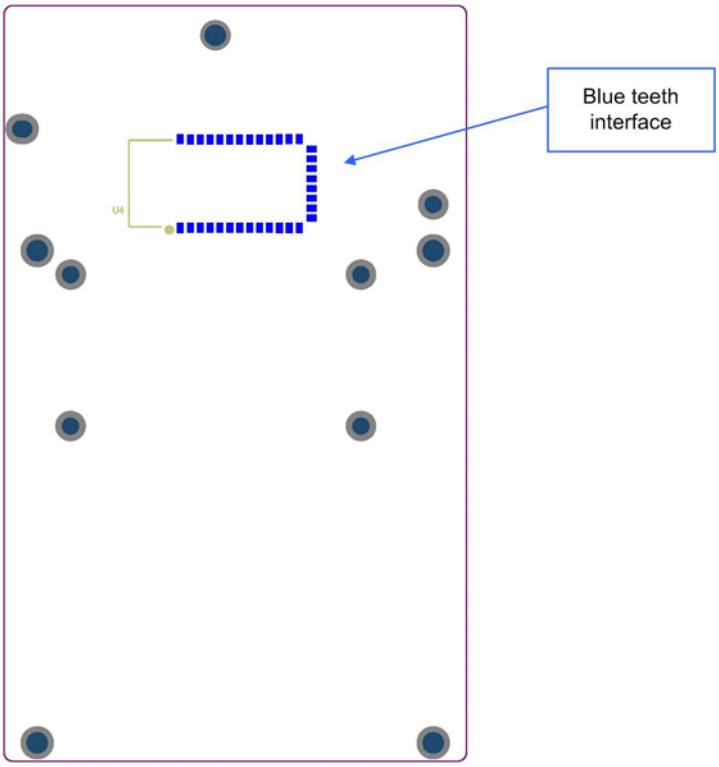

Figure 2-2: The back PCB silk screen of MTP58-FTxx-T1 evaluation board

Table 2-1: The description of the function components

Function Component		Description
Micro-thermal printer core		ZLG ZTP486F-H101/L101, a 58mm micro-thermal printer core, is developed by Guangzhou ZLGMCU Development Co., Ltd. (compatible with Fujitsu FTP-628MCL101 printer core)
Power supply input interface		Supplied by system
RS-232C interface		Connect to the RS-232C interface of Master PC via a serial port cable
LED indicator and Paper feed button	PT_ERROR	State Indicator: Always on: normal working; Flickering in 1Hz frequent: the power supply voltage is over 8.5V; Flickering in 2Hz frequent: paper end; Flickering in 4Hz frequent: over temperature
	PR_POWER	Power indicator, always on for normal working
	FEED	Paper feed button (press the button and hold, then power on the machine, test page printing will be performed)
Micro-thermal printer control board installation place		The place is used for MTP58-FTxx series micro-thermal printer control board
Interface selection jumper		Select the communication interface from four interfaces
Power output interface		Power supply output, available for user
TTL interface		Connect to the TTL serial port via a DuPont line
USB interface		Connect to the USB host interface via a USB cable

Function Component	Description
Blue teeth interface	Connect to other blue teeth device via the blue teeth wireless communication

Chapter 3: Description for Use

3.1 How to install the thermal paper roll

3.1.1 Introduction of thermal paper

Thermal paper is also called thermal fax paper, thermal record paper or thermal copy paper. It is a special fine paper that is coated with a chemical that changes color when exposed to heat (over the temperature of 70℃). And it is widely used in thermal printers. Figure 3-1 shows a 58mm thermal paper for 58mm micro-thermal printer.

The thermal paper has a printing side (coated with thermal-sensitive material) and a non-printing side. Generally, the outer side of the thermal paper is the printing side, and the inner side is the non-printing side, as Figure 3-1 shows. Notice that user should let the printing side of the paper roll face towards the printer core, and avoid letting the non-printing side face towards the platen of the printer core, otherwise the data cannot be print out properly.

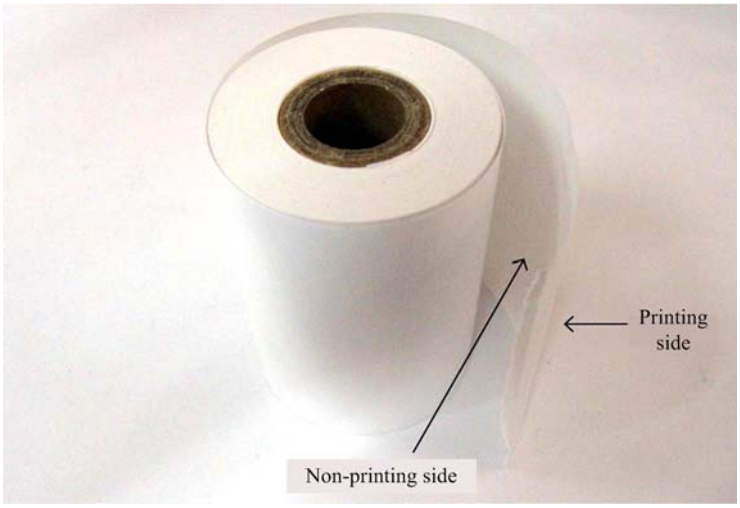

Figure 3-1: The printing side & the non-printing side of a 58mm thermal paper

3.1.2 Steps of installation

1. Open the platen

Figure 3-2 and Figure 3-3 shows how to open the platen on the printer core.

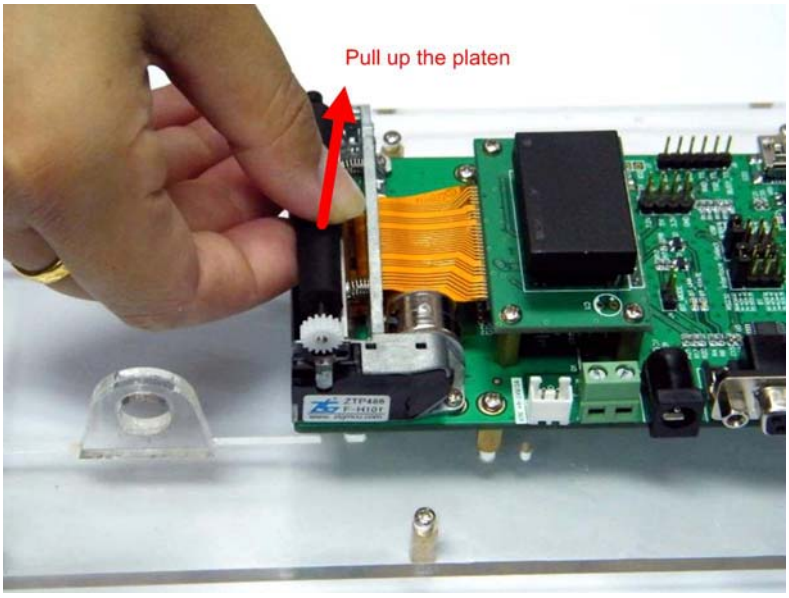

Figure 3-2: Open the platen on the printer core

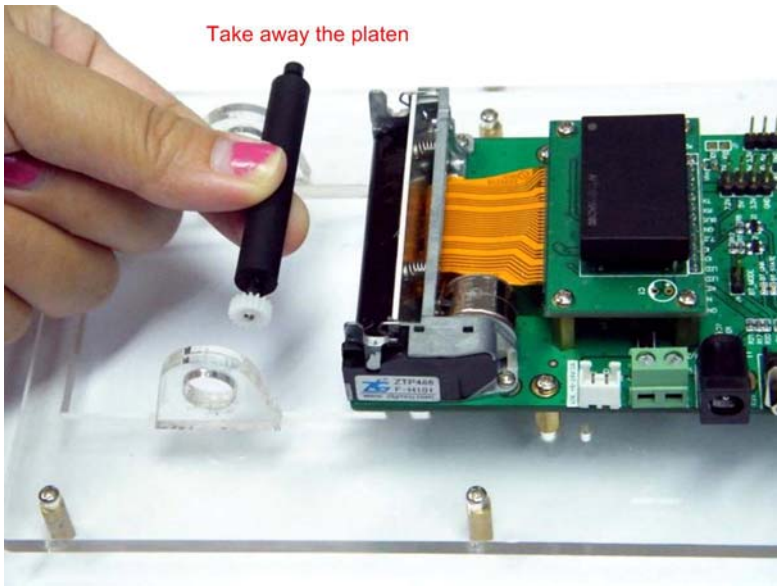

Figure 3-3: Take away the platen

2. Install the thermal paper roll

Figure 3-4 to Figure 3-5 show how to install the thermal paper roll.

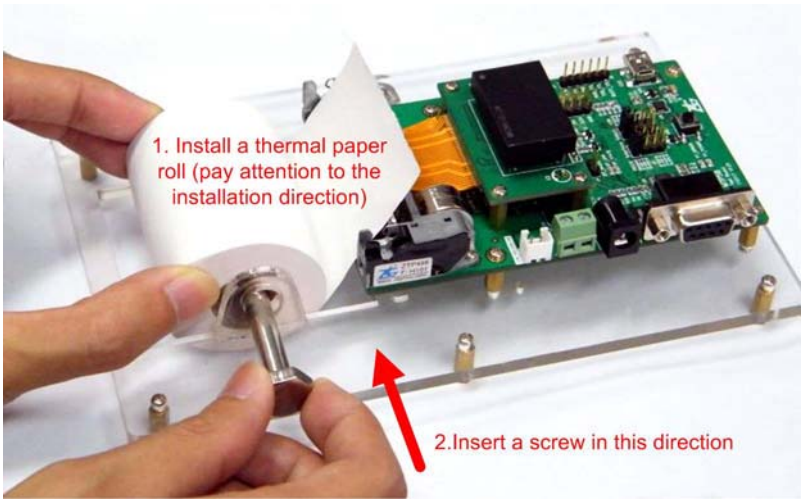

Figure 3-4: Install a thermal paper roll and insert a screw

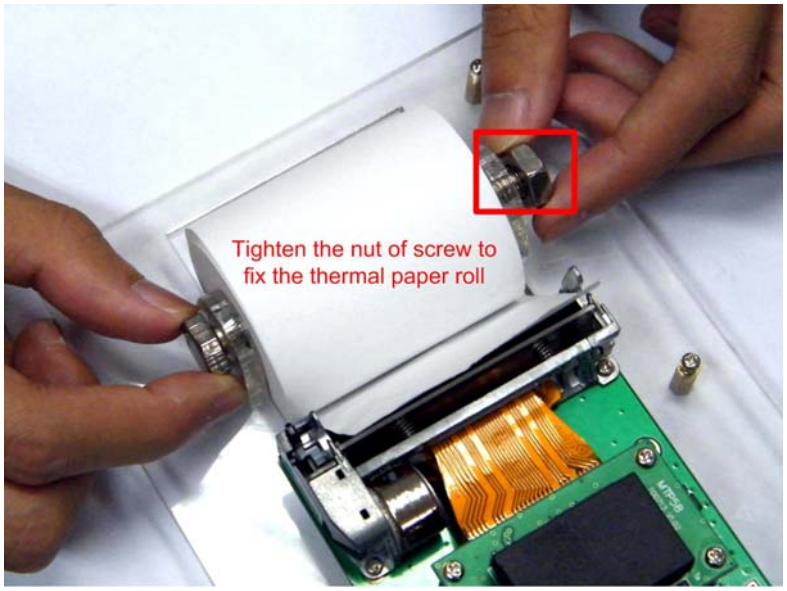

Figure 3-5: Tighten the nut of screw to fix the thermal paper roll

3. Install the platen

Figure 3-6 and Figure 3-7 show how to install the platen.

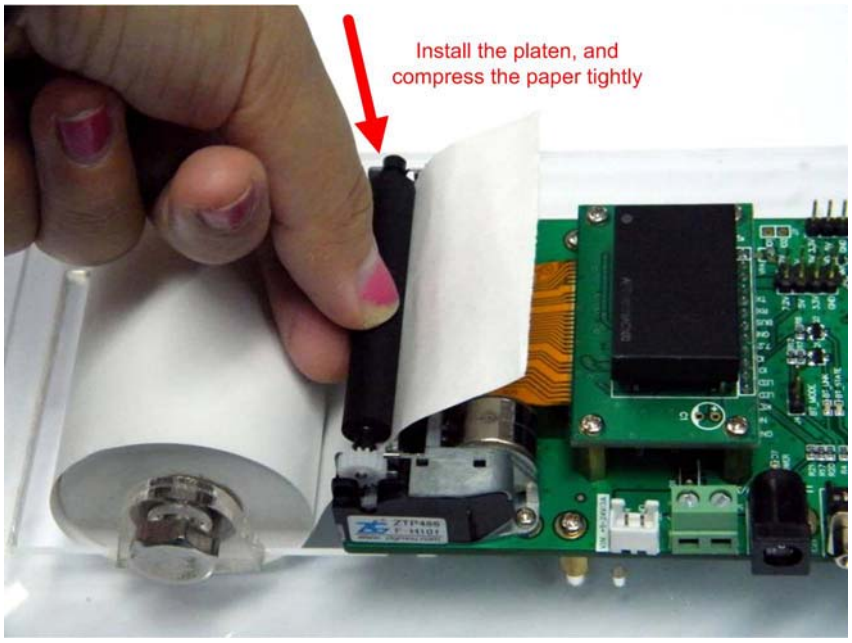

Figure 3-6: Install the platen and compress the paper

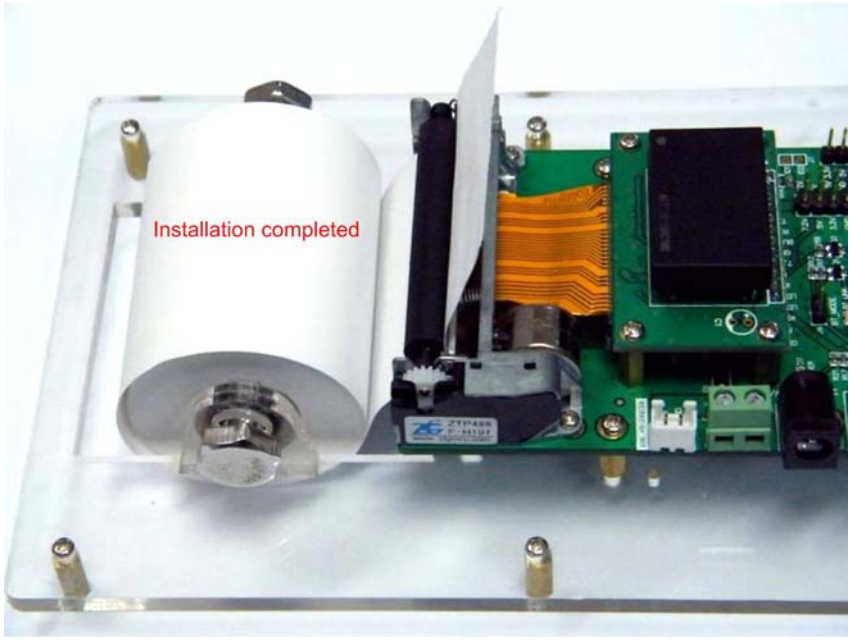

Figure 3-7: Installation completed

Notes: *The thermal paper should be perpendicular to the platen to avoid the paper jam caused by the tilted paper feeding.*

3.2 Power supply input/output interface

3.2.1 Power supply input interface

The MTP58-FTxx-T1 evaluation board uses a 9~26V/3A DC power supply. There are 3 types of power supply input interface provided for different requirements, as Figure 3-8 shows. Any one of them can be selected in use. The positive and negative poles of the power supply must be connected correctly; otherwise the circuit would be burned out.

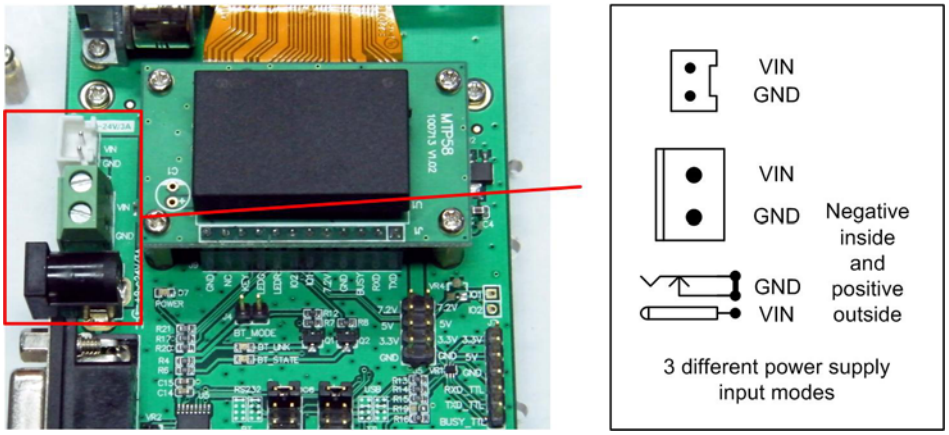

Figure 3-8: Power supply input interface

The MTP58-FTxx-T1evaluation board kit includes an AC/DC (220~/12V) adapter, of which the output interface is a DC power supply plug (positive pole inside and negative pole outside), as Figure 3-8 shows.

3.2.2 Power supply output interface

The MTP58-FTxx-T1 provides 3 power supply output interfaces: 7.2V[1] (Max.4A), 5V[1] (Max.800mA) and 3.3V[1] (Max.800mA) interfaces, as Figure 3-9 shows.

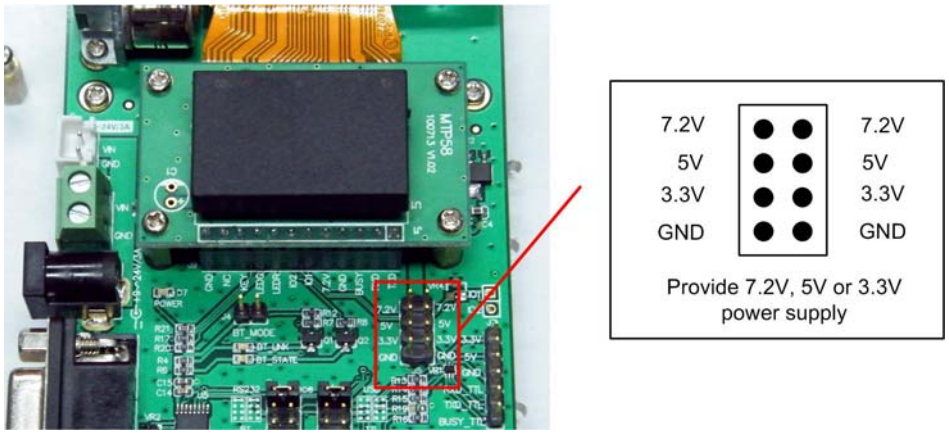

Figure 3-9: Power supply output interface

Notes: *The power supply output interfaces can work at a same time.*

3.3 Communication interface

3.3.1 Communication interface selection

MTP58-FTxx-T1 provides 4 communication interfaces, and only one interface can be used at a time. The selection of communication interface is done by setting the interface selection jumper, as Figure 3-10 shows.

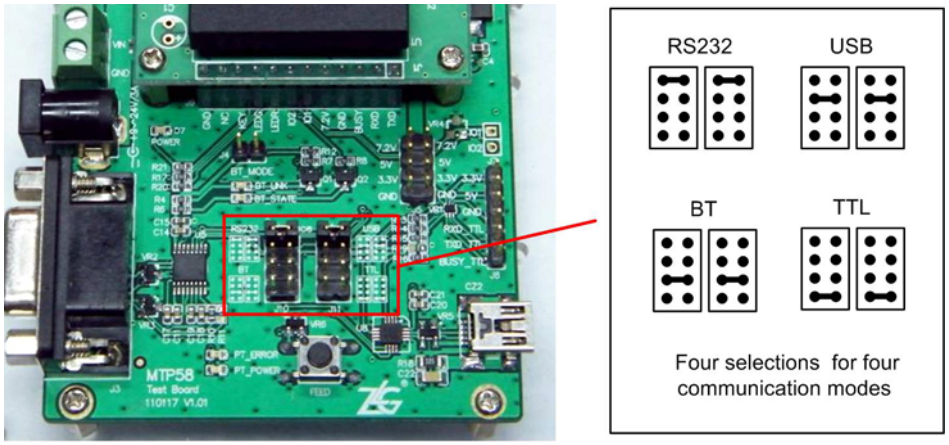

Figure 3-10: Four Communication interface selections

3.3.2 RS-232C communication interface

This communication interface adopts the SP3232EEY-L/TR chip to perform the conversion from RS-232C to TTL. Figure 3-11 shows the circuit of RS-323C on the MTP58-FTxx-T1.

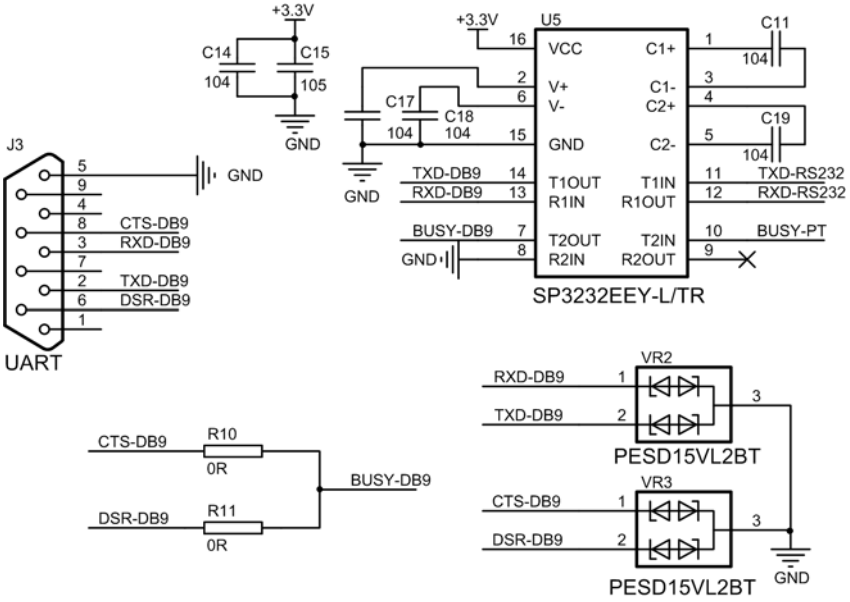

Figure 3-11: RS-232C level conversion circuit

Notes that the R10 and the R11 in Figure 3-11 are used for hardware flow control mode selection, but only R10 is available, since MTP58-FTxx-T1 evaluation board supports CTS/RTS by default.

3.3.3 USB communication

3.3.3.1 USB communication circuit

This communication interface adopts the XR24V1410 chip to perform the conversion from USB to TTL. Figure 3-12 shows the circuit of USB on the MTP58-FTxx-T1.

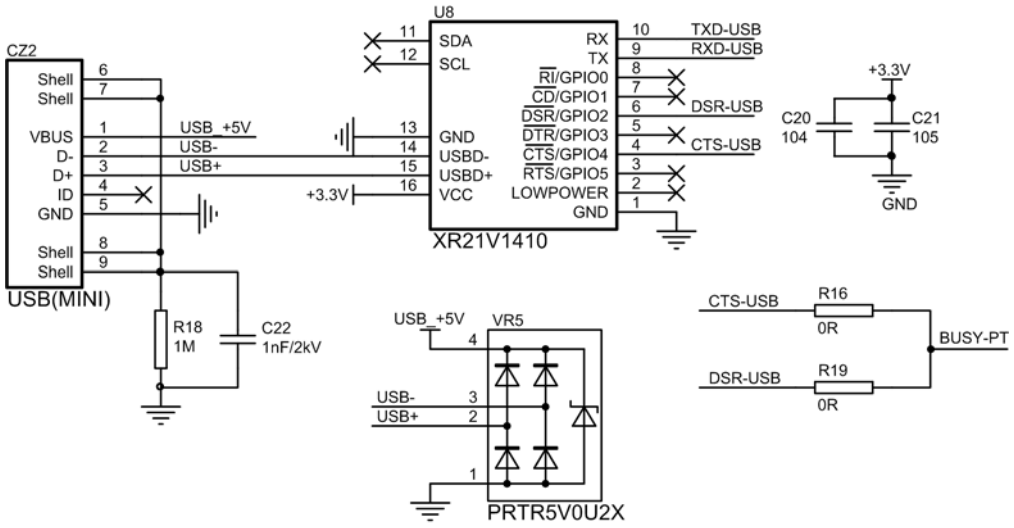

Figure 3-12: USB level conversion circuit

3.3.3.2 Driver installation under Windows XP

For USB communication, the MTP58-FTxx-T1 shall be connected to the PC via the USB interface. In the case of the first connection between the device and PC, the “Found New Hardware” information prompt will appear on the lower-right corner of the PC desktop after the MTP58-FTxx-T1 is powered up, as Figure 3-13 shows.

In the Found New Hardware Wizard, select the "Install from a list or specific location (Advanced)” option, and click the Next button, as Figure 3-14 shows. Then, a dialog box will pop up, as Figure 3-17 shows.

Figure 3-13: Found New Hardware

Figure 3-14: Select the "Install from a list or specific location

Click the Browse button, and find out the driver file (for example: C:\Xr21v141x-xp2kvista7-driver\x86), and then click the Ok button, as Figure 3-17 shows.

Notes: *The download address is http://www.zlgmcu.com/exar/uart/datesheet/xr21v141x_driver.rar.*

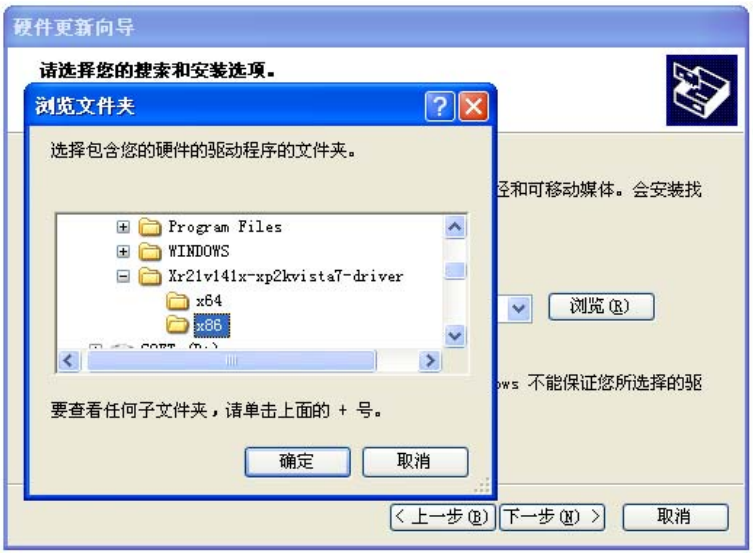

Figure 3-15: Select the storage path of USB Driver

When the installation is completed, a dialog box will appear to show corresponding information, as Figure 3-16 shows.

Figure 3-16: Installation completed

If the driver is installed properly, the MTP58-FTxx-T1 will appear in the list within the Device Manager. Click “My Computer”, and select “Properties” option, and then click “Device Manager”, a window will pop up, as Figure 3-17 shows. In this window, users may find that the new serial device would be listed under “Port (COM and LPT)”.

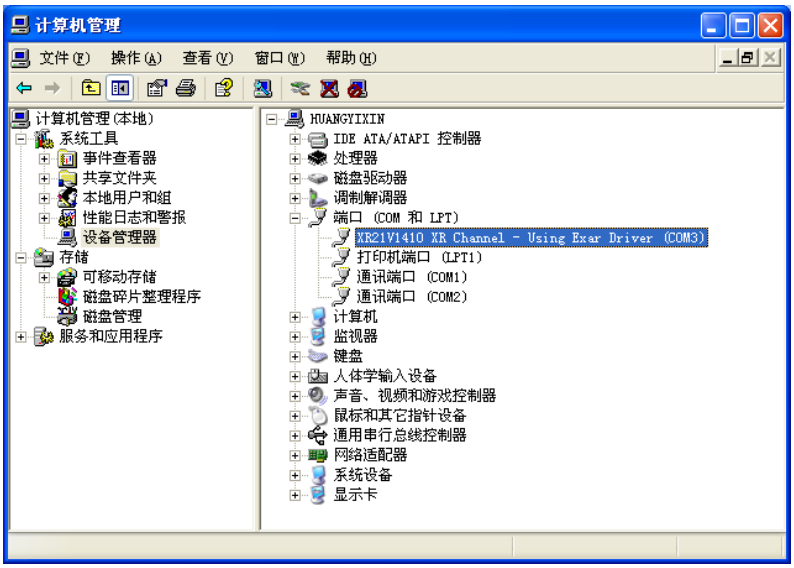

Figure 3-17: Proper installation

If the driver is improperly installed or no driver is installed, the MTP58-FTxx-T1 is not available. In this case, Right-click the mouse, and select the “Update Driver” option, follow the steps described above to reinstall the driver.

When the installation is successful, run the PC testing software, MicroPrinter.exe, the COM3 will appear in the serial port list, as Figure 3-18 shows.

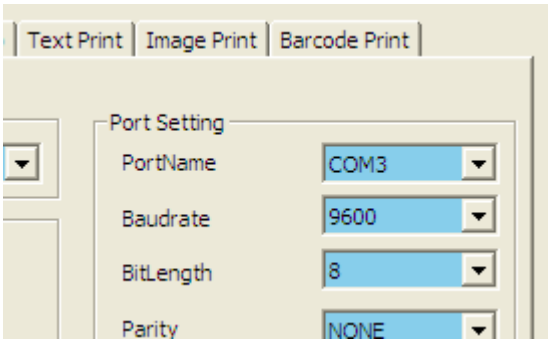

Figure 3-18: Serial port list

3.3.4 Blue teeth communication mode

The blue teeth interface in the MTP58-FTxx-T1 adopts the HHW-S10 blue teeth communication module from Shenzhen HENHAOWEI Technology. Co., Ltd. Figure 3-19 shows the blue teeth module. For more information, please refer to “micro-thermal printer blue teeth communication solution”.

Notes: *Since the blue teeth module is a optional component, user may buy it as required.*

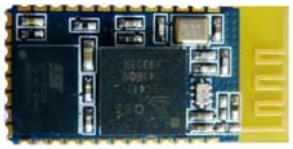

Figure 3-19: HHW-S10 blue teeth module

3.3.5 TTL serial port

The TTL serial port is connected to the control module within the MTP58-FTxx-T1 directly. It supports 3.3V~5V input voltage and 3.3V output voltage, as Figure 3-20 shows.

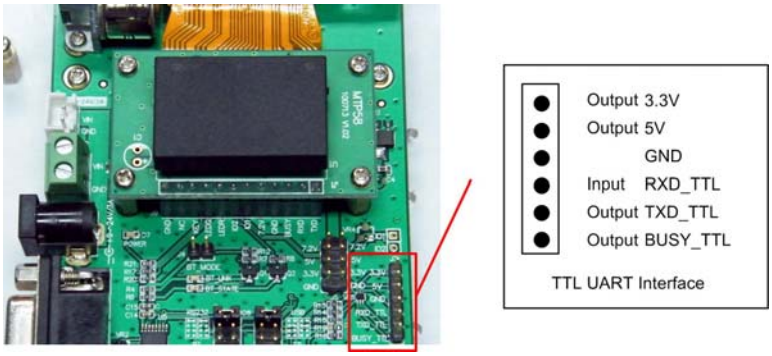

Figure 3-20: TTL level UART serial port

3.4 Micro-thermal printer control board

MTP58-FTxx-T1 series micro-thermal printer control board is the dedicated control circuit board of ZLG ZTP486F-H101/L101 micro-thermal printer core. It contains a ZYTP58-FTxx micro-thermal printer control module, which can be applied for printing separately from MTP58-FTxx-T1 by connecting to a printer core and power supply. Figure 3-21 shows the MTP58-FTxx-T1.

Figure 3-21: MTP58-FTxx

The features of MTP-FTxx series micro-thermal printer control board is as follows:

- Support the printer core with Fujitsu FTP-628MCL101 compatible, such as ZLG ZTP486F-H101/L101, Fujitsu FTP-628MCL101, SEIKO LTP-628MCL101, Samsung Bixolon SMP685, APS FM205-HS and so on;
- Utmost low consumption mode: 10μA only;
- Compact size for different embedded applications, physical dimension: 50mm×30mm×12.4mm;
- Support wide printing voltage range: 3.5~8.5V, and provide automatic confutation 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 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, support RTS/CTS and Xon/Xoff protocols.

Figure 3-22: ZLG ZTP486F-H101/L101

The features of ZLG ZTP486F-H101/L101 micro-thermal printer core include:

- Easy paper loading design;
- Printing paper width: 57±1mm;
- Physical dimension: 70mm(Width)×30mm(Depth)×12.4mm(Height);
- Printing width: 48mm;
- Weight of printer core: 42g;
- Driving voltage: 3.5~8.5V(L)/4.2V~9.5V(H);
- Operating endurance: more than 50km;
- Printing speed: 85mm/sec(L)/700/sec(H);
- Paper detection.

Notes: *For more information about the micro-thermal printer control board and micro-thermal printer core, please refer to "MTP58-Fxxx data sheet" and "ZLG ZTP486F data sheet".*

3.4.1 Pin information

Figure 3-23 shows the pin assignment of the control board within MTP58-FTxx-T1 series, and Table 3-1 lists its pin definitions.

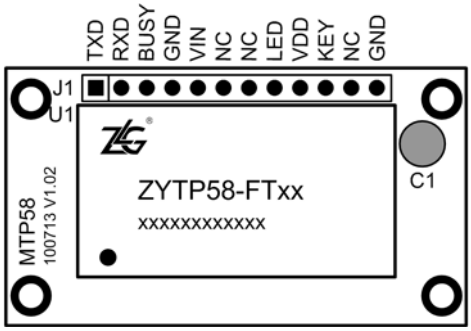

Figure 3-23: Pin Assignments

Table 3-1: Pin Definition

Pin	No.	I/O	Description	
TXD	1	Output	Serial interface sending	
RXD	2	Input	Serial interface receiving	
BUSY	3	Output	RTS/CTS flow control indicator	
			BUSY pin outputs logic "1"	The printer is busy, no data will be received.
			BUSY pin outputs logic "0"	The printer is ready to receive data.
GND	4	-	Ground	
VIN	5	Input	Power supply input	
NC	6	-	-	
NC	7	-	-	
LED	8	Output	This pin can be connected to state indicator to indicate the working statue of the printer[3]	
			Always on: Normal working	
			Flickering in 1Hz frequent: the power supply voltage is over 8.5V	
			Flickering in 2Hz frequent: paper end	
			Flickering in 4Hz frequent: over temperature	

Pin	No.	I/O	Description
VDD	9	Input	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]
KEY	10	Output	Feed paper key and test page printing key (press the key and hold, then power on the machine, test page printing will be performed)[2]
NC	11	Output	-
GND	12	-	Ground

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 3-24.

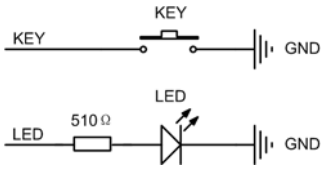

Figure 3-24: The LED and KEY pins internal connection circuit

3.4.2 Schematic diagram of control board

Figure 3-25 shows the circuit of the MTP58-FTxx-T1 micro-thermal printer control board circuit schematic diagram.

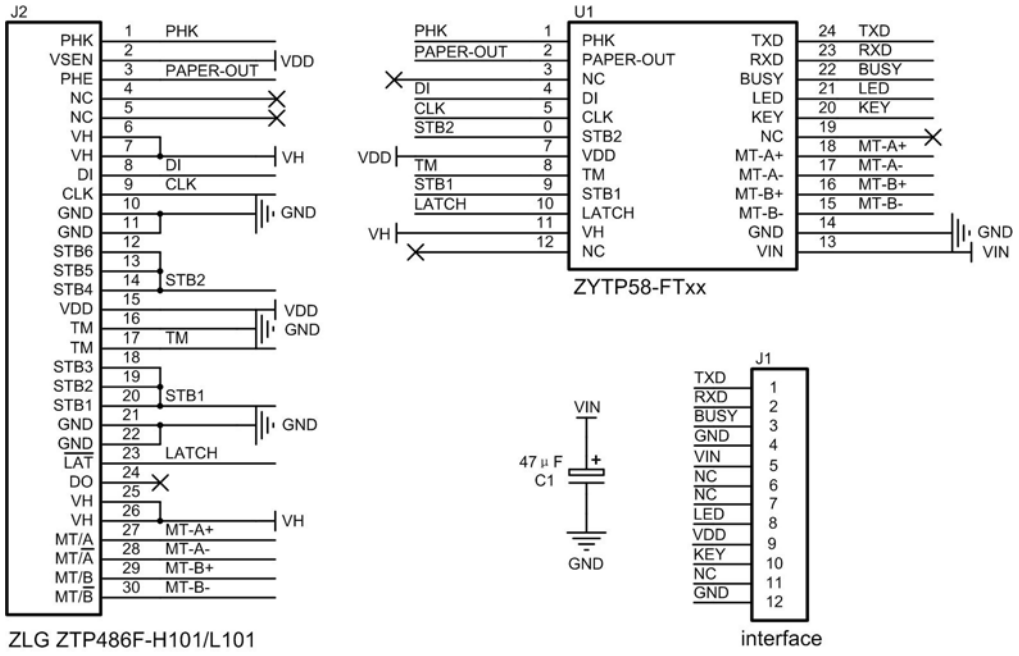

Figure 3-25: MTP58-FTxx-T1 circuit schematic diagram

3.5 PC testing software

The evaluation board is provided with a PC host test software, as Figure 3-26 shows. User can use the software to test micro-thermal printer control module and study the ESC/POS protocol. For more information, please refer to “MicroPrinter specification”.

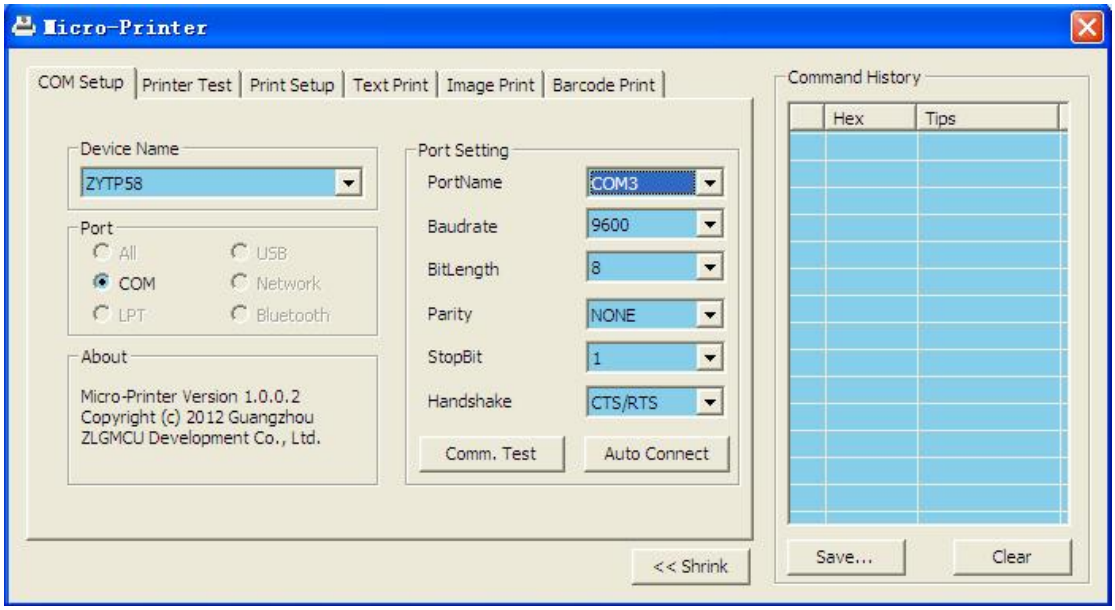

Figure 3-26: PC testing software interface

Chapter 4: Rights & Statements

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