Connective Peripherals Pte Ltd

Datasheet

Chipi-X Cable

Chipi-X is a USB to full-handshake RS232 cable with a male DB9 connector. This cable is available with or without an enclosure.

1 Introduction

The Chipi-X cable is a USB to RS232 level full-handshake UART cable. Chipi-X utilises the FT231XS USB to full-handshake UART IC and FT3243S RS232 transceiver IC. A male DB9 (aka DE9) connector provides the connectivity for RS232 communications and a USB-A plug tethered by a 10cm cable to the PCB provides connectivity for USB communications.

All components used are Pb-free (RoHS compliant).

1.1 Features

- Entire USB protocol handled on the FT231XS chip
- FTDI's royalty-free VCP and D2XX drivers eliminate the requirement for USB driver development in most cases
- UART interface support for 7 or 8 data bits, 1 or 2 stop bits and odd / even / mark / space / no parity.
- Fully assisted hardware or X-On / X-Off software handshaking.
- Data transfer rates from 300 baud to 250 kilo-baud at RS232 voltage levels.
- 512 bytes receive buffer and 512 bytes transmit buffer utilising buffer smoothing technology to allow for high data throughput
- Adjustable receive buffer timeout.
- ESD protection on RS232 I/Os exceeding ±15kV IEC1000-4-2 Air Gap Discharge, ±15kV for Human Body Mode (HBM) and ±8kV IEC1000-4-2 Contact Discharge.
- ESD protection on USB lines exceeding ±2kV for Human Body Mode (HBM), ±200V for Machine Mode (MM) and ±500V for Charged Device Mode (CDM).
- Integrated MTP-ROM for storing USB VID, PID, serial number and product description strings.
- Low operating and USB suspend current.
- Low USB bandwidth consumption.
- USB 2.0 Full Speed compatible.
- -40°C to 85°C extended operating temperature range.
- Latch-up Free

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2 Driver Support

Royalty-Free VIRTUAL COM PORT (VCP) DRIVERS for:

- Windows 11, 10, 8.x, 7
- Windows XP (legacy)
- Windows CE 4.2, 5.0 and 6.0 (Legacy)
- macOS 10.9 and above
- Linux 2.4 and greater

Royalty-Free D2XX Direct Drivers (USB Drivers + DLL S/W Interface):

- Windows 11, 10, 8.x, 7
- Windows XP (legacy)
- Windows CE 4.2, 5.0 and 6.0 (Legacy)
- macOS 10.9 and above
- Linux 2.4 and greater

The drivers listed above are all available to download for free from https://connectiveperipherals.com and from the FTDI website.

2.1 Driver Installation

For driver installation and troubleshooting, please refer to the **Connective Peripherals USB to Serial Converters Driver Installation Guide (CP_000084)** which is available from www.connectiveperipherals.com.

3 Ordering Information

Part Number	Description
Chipi-X	Generic part number, no part assigned to this part number.
CHIPI-X10	USB to RS232 converter with a 10cm cable and an enclosure. FCC and CE approved.
CHIPI-X-NE10	USB to RS232 converter with a 10cm cable and **no enclosure**.

Table 3.1 – Chipi-X Ordering Information

4 Functional Description

4.1 Block Diagram

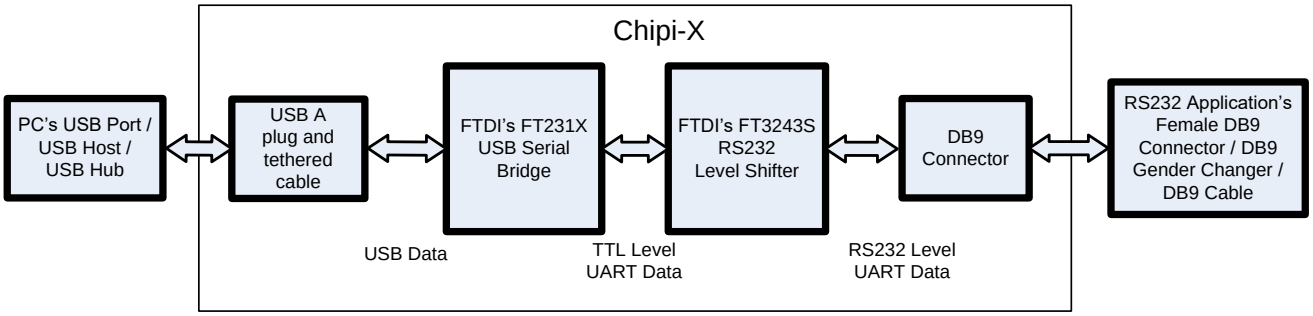

Figure 4.1 – Chipi-X Block Diagram

4.2 Electrical Details

Parameter	Description	Minimum	Typical	Maximum	Units	Conditions
Vtrans	Transmitter output voltage swing	+/- 5	+/- 6.5	+/- 15	V	
Vrec	Receiver input voltage range	-25		+25	V	

Table 4.1 – Chipi-X I/O Characteristics

Description	Conditions	Minimum	Typical	Maximum
ESD HBM	RS-232 Inputs and Outputs		±15 kV	
EN61000-4-2ContactDischarge	RS-232 Inputs and Outputs		±8 kV	
EN61000-4-2AirGapDischarge	RS-232 Inputs and Outputs		±15 kV	

Table 4.2 – Chipi-X ESD Tolerance

5 Chipi-X Signals and Pin Out

5.1 RS232 Signals

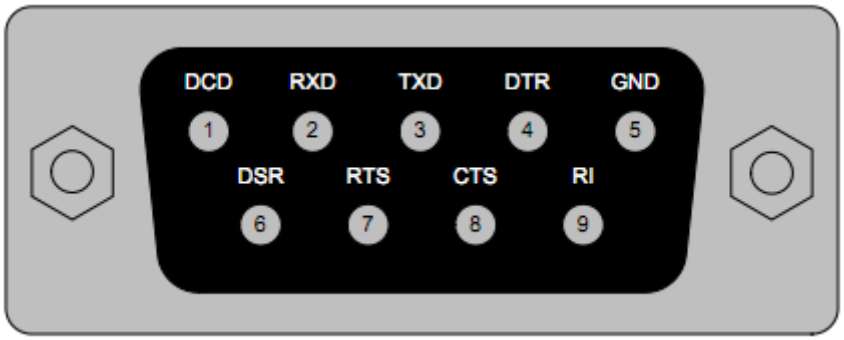

Figure 5.1 – Chipi-X DB9 Pin Out

DB9 pin No.	Name	Type	Description
1	DCD	Input	Data Carrier Detect control input.
2	RXD	Input	Receive Asynchronous Data input.
3	TXD	Output	Transmit Asynchronous Data output.
4	DTR	Output	Handshake signal: Data Terminal Ready control output.
5	GND	Ground	Device ground supply pin
6	DSR	Input	Handshake signal: Data Set Ready control input
7	RTS	Output	Handshake signal: Request To Send Control Output
8	CTS	Input	Handshake signal: Clear to Send Control input
9	RI	Input	Ring Indicator control input. When remote wakeup is enabled in the FT231XS's internal MTP-ROM taking RI# low can be used to resume the PC USB host controller from suspend.

Table 5.1 – Chipi-X RS232 Signals

5.2 USB Signals

Wire Colour.	Name	Type	Description
Red	VBUS	Power	5V power.
White	DM	Signal	USB data.
Green	DP	Signal	USB data.
Black	GND	Ground	Ground.
Black (longer wire)	Shield	Shield	Cable shield

Table 5.2 – Chipi-X USB Lines

6 Module Dimensions

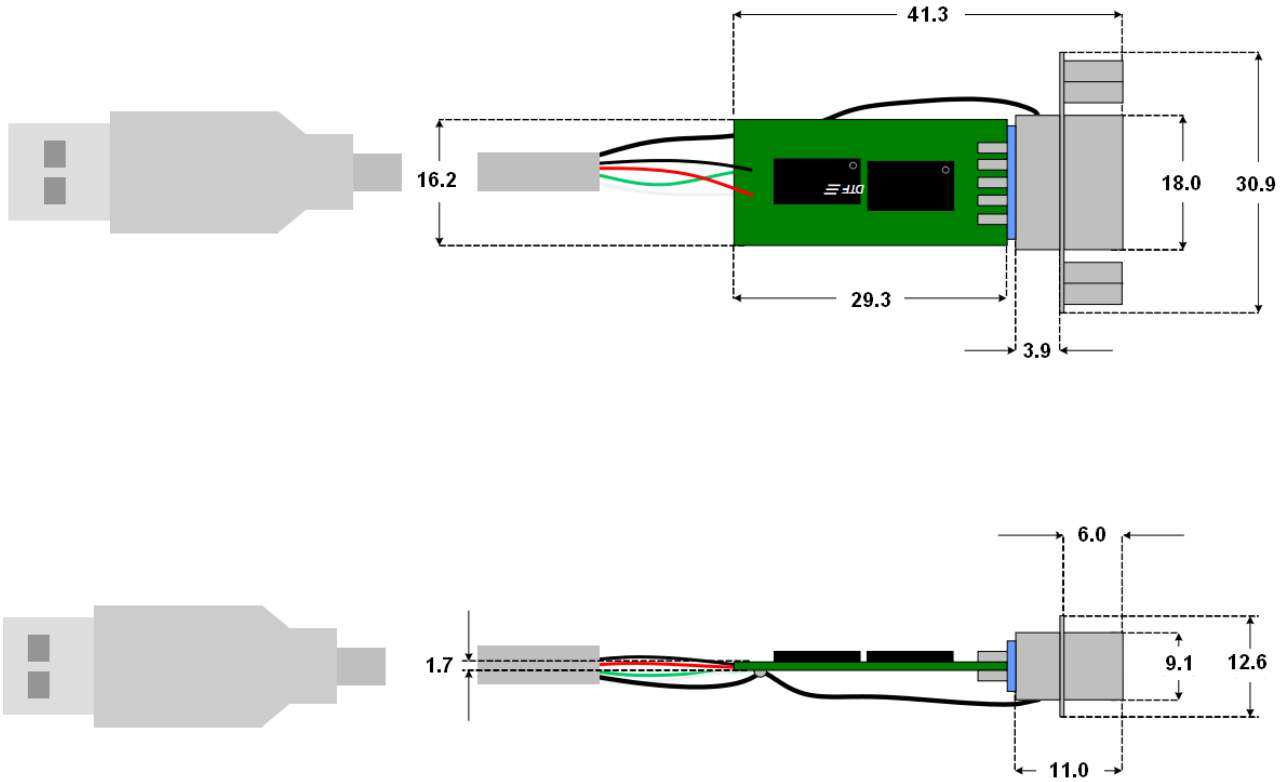

Figure 6.1 – Chipi-X Dimensions

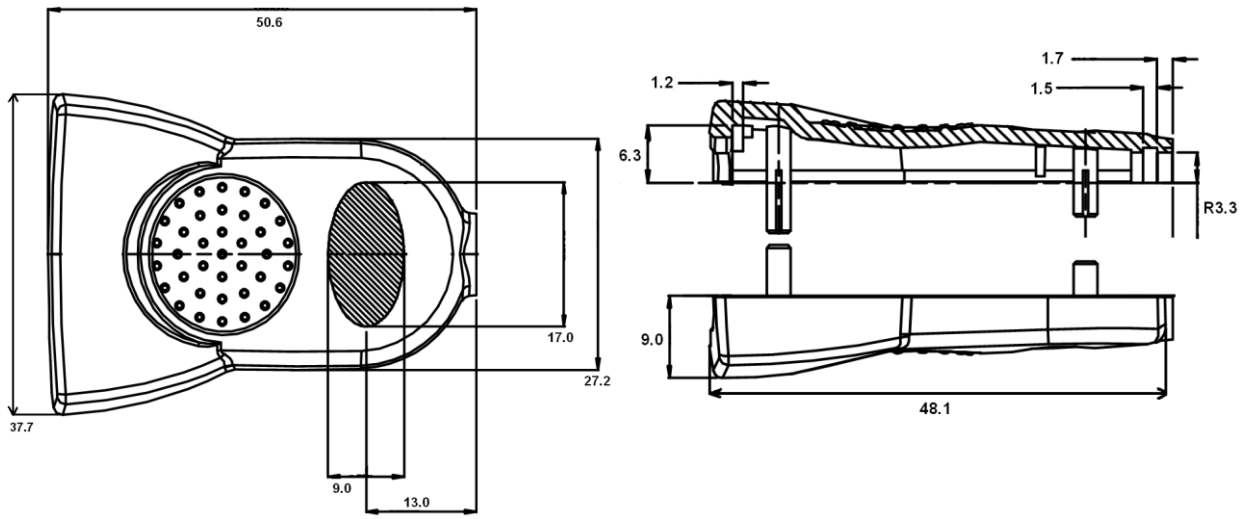

Figure 6.2 – Enclosure Dimensions

All dimensions are given in millimetres.

Chipi-X cables only use lead free components, and are fully compliant with European Union directive 2002/95/EC.

7 Chipi-X Circuit Schematic

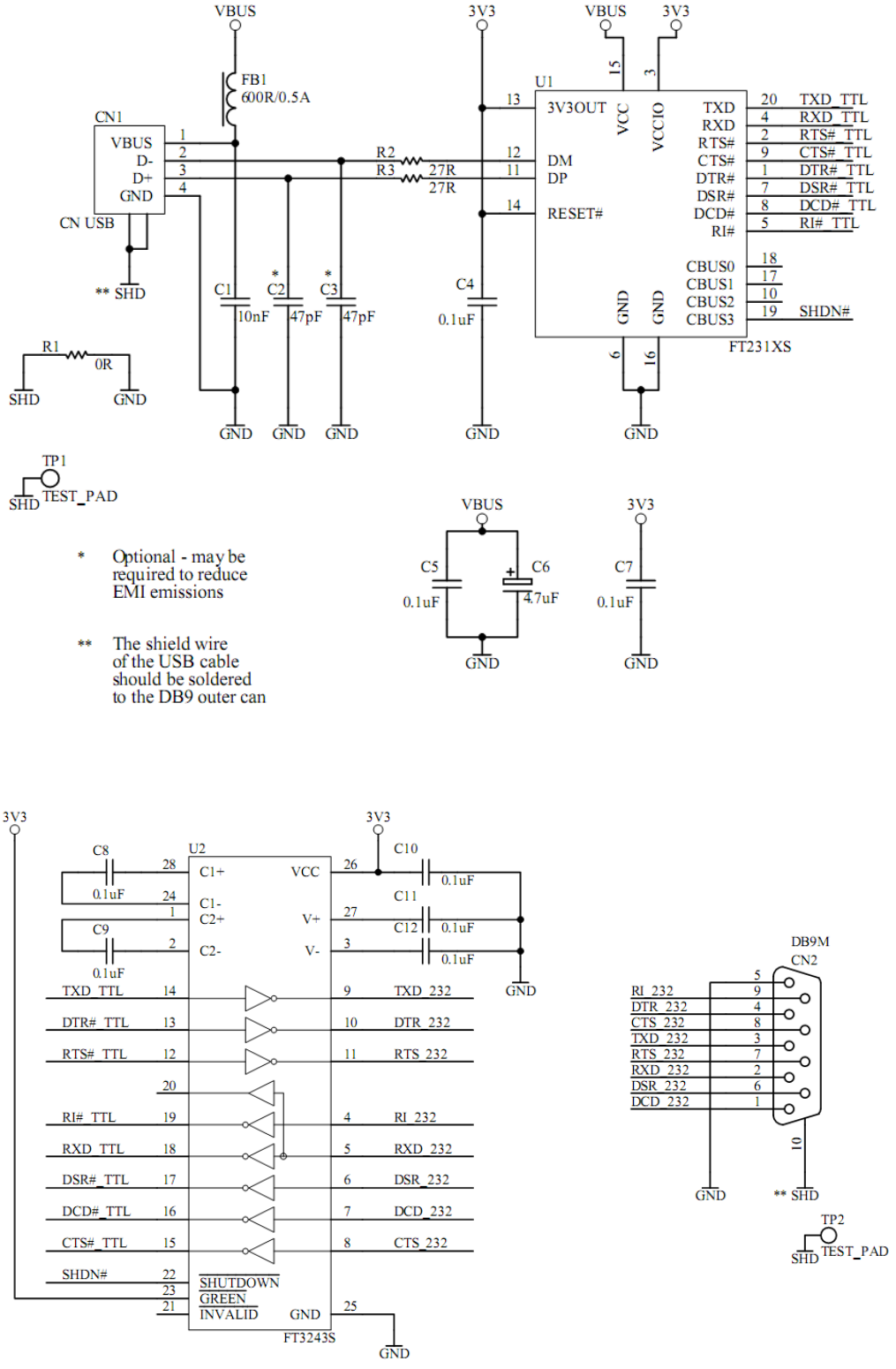

Figure 7.1 – Chipi-X Circuit Schematic

8 Internal MTP ROM Configuration

Following a power-on reset or a USB reset the FT231X will scan its internal MTP ROM and read the USB configuration descriptors stored there. The default values programmed into the internal MTP ROM in the FT231XS used on the Chipi-X are shown in **Table 8.1.**

Parameter	Value	Notes
USB Vendor ID (VID)	0403h	FTDI default VID (hex)
USB Product UD (PID)	6015h	FTDI default PID (hex)
Serial Number Enabled?	Yes	
Serial Number	See Note	A unique serial number is generated and programmed into the MTP ROM during final test.
Pull down I/O Pins in USB Suspend	Disabled	Enabling this option will make the device pull down on the UART interface lines when the power is shut off (PWREN# is high). Note that these are the lines between the FT231X and the RS232 line driver and not the RS232 outputs accessible on the wire ends.
Manufacturer Name	FTDI	
Product Description	Chipi-X	
Max Bus Power Current	90mA	
Power Source	Bus Powered	
Device Type	FT231X	
USB Version	0200	Returns USB 2.0 device description to the host. Note: The device is a USB 2.0 Full Speed device (12Mb/s) as opposed to a USB 2.0 High Speed device (480Mb/s).
Remote Wake Up	Enabled	Taking RI# low will wake up the USB host controller from suspend.
High Current I/Os	Disabled	Enables the high drive level on the UART and CBUS I/O pins. Note that these are the lines between the FT231X and the RS232 line driver and not the RS232 outputs accessible on the wire ends.
Load VCP Driver	Enabled	Makes the device load the VCP driver interface for the device.
CBUS0	Tristate	
CBUS1	Tristate	
CBUS2	Tristate	
CBUS3	SLEEP#	
Invert UART	Disabled	Signal on this pin becomes TXD# if enable.

Table 8.1 – Default Internal MTP ROM Configuration

The internal MTP in the cable can be re-programmed over USB using the utility program FT_Prog. The latest version can be downloaded here: FT_Prog. Users who do not have their own USB Vendor ID but who would like to use a unique Product ID in their design can apply to CP for a free block of unique PIDs. Contact CP support@connectiveperipherals.com Refer to TN_100 and TN_101 for more details.

Note that the MTP is supplied programmed ready to use for most applications. Changing the MTP settings is for advanced users only. Changing the settings can cause incorrect operation of the device. Before editing the VID or PID, note that this requires the user to have a driver with matching VID/PID in order to install the device before it can be used again. It is recommended to contact technical support if in doubt before making any changes.

9 Contact Information

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Appendix A - References

Document References

TN_100 USB Vendor ID / Product ID Guidelines
TN_101 Implementing Custom FTDI VID and PID Codes using Linux

Acronyms and Abbreviations

Terms	Description
DLL	Dynamic Link Library
IC	Integrated Circuit
HBM	Human Body Model
MM	Machine Mode
PCB	Printed Circuit Board
USB	Universal Serial Bus
UART	Universal Asynchronous Receiver Transmitter
VCP	Virtual COM Port

Appendix B – List of Tables and Figures

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Appendix C – Revision History

Revision	Changes	Date
Version 1.0	Transferred from FTDI to CP; Added driver install section and other minor updates	28-1-2023