Future Technology Devices International Ltd

Application Note AN_243

FT312D USB Host to UART Cable Application

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This application note illustrates how to develop a USB host to UART/RS232 cable for Android Open Accessory. The FT312D USB to serial UART converter chip will be used on this Android application.

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1 Introduction

The FT312D is a dedicated USB Full Speed host bridge chip that has been designed specifically to support Android Open Accessory protocol. The FT312D connects to a USB device on the Android platform, establishes the USB connection, enumerates Open Accessories, and then provides a bridge from the USB host port to a UART interface. All necessary USB and Android Open Accessory protocol is incorporated in the FT312D, so that designers can quickly and easily establish a USB connectivity link and have a basic UART (RXD, TXD, RTS, CTS signals) interface for their end systems.

Android Open Accessory Protocol is supported in Android Honeycomb (3.1) and later versions, with the benefit that data can be transmitted and received without additional driver support. This document gives a brief introduction to the features and applications of the FT312D (USB Android Host chip), and demonstrates the USB to UART bridge function. A cable application is used as the specific example.

1.1 Block Diagram

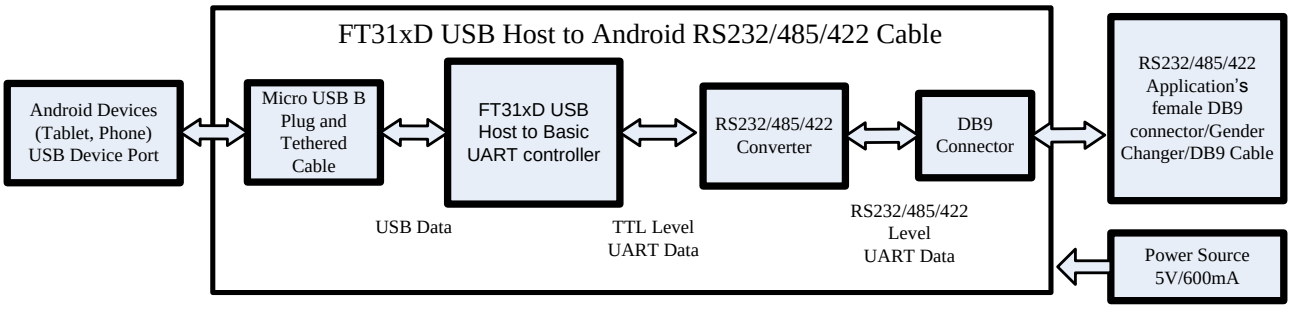

Figure 1 USB Host to Android RS232/485/422 Cable

1.2 FT312D Feature

- Suitable for use on any Android platform supporting Android Open Accessory Mode (Typically 3.1 onwards, however some platforms may port Open Accessory Mode to version 2.3.4)
- Basic UART interface with RXD, TXD, RTS, CTS pins option.
- Provide general HyperTerm UART utility; easily adaptable to a console function.
    - Support CTS/RTS Flow control
    - Support Baud from 300 to 921600 with CTS/RTS flow control
    - Support Baud from 300 to 115200 without flow control
    - Save file and Send file functions
- FT312D large UART RX buffer size of 5512 bytes for enhanced UART performance. (FT311D RX buffer is 512Byte)
- USB Plug and Play
- Provide power source to the Android device via the Y-cable configuration.
- USB 2.0 Full Speed compatible.
- USB error and over current indicator.

- Suitable for TTL, RS232, RS422, or RS485 depending on the transceiver used in conjunction with the FT312D.

FT312D data sheet may be downloaded from:
http://www.ftdichip.com/Support/Documents/DataSheets/ICs/DS_FT312D.pdf

2 Application Examples

The following sections illustrate possible applications of the FT312D.

2.1 USB to RS232

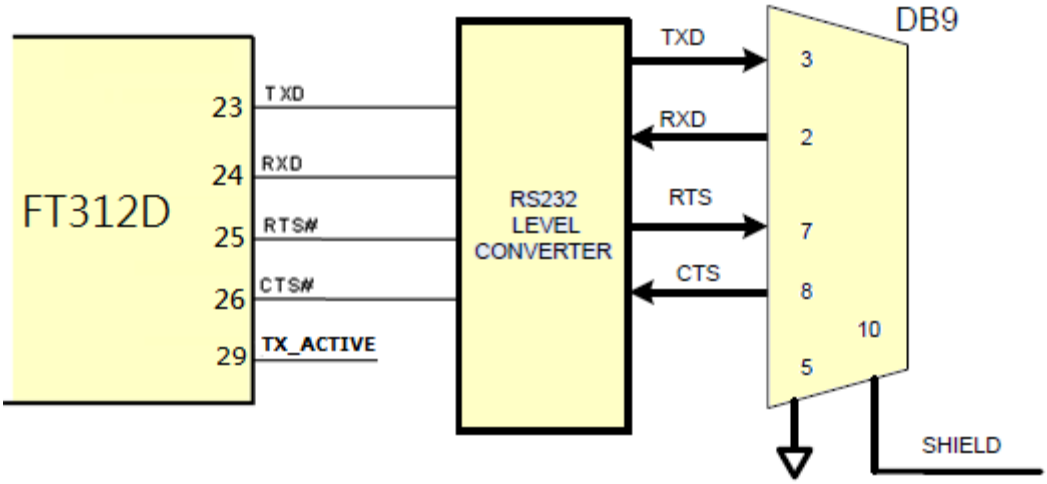

Figure 2 Application Example Showing USB to RS232

2.2 USB to RS485

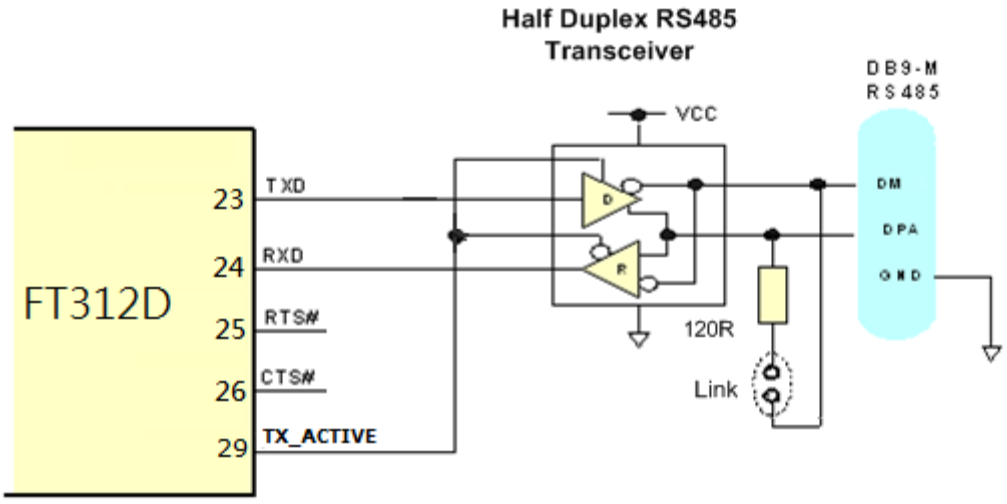

Figure 3 Application Example Showing USB to RS485

2.3 USB to RS422

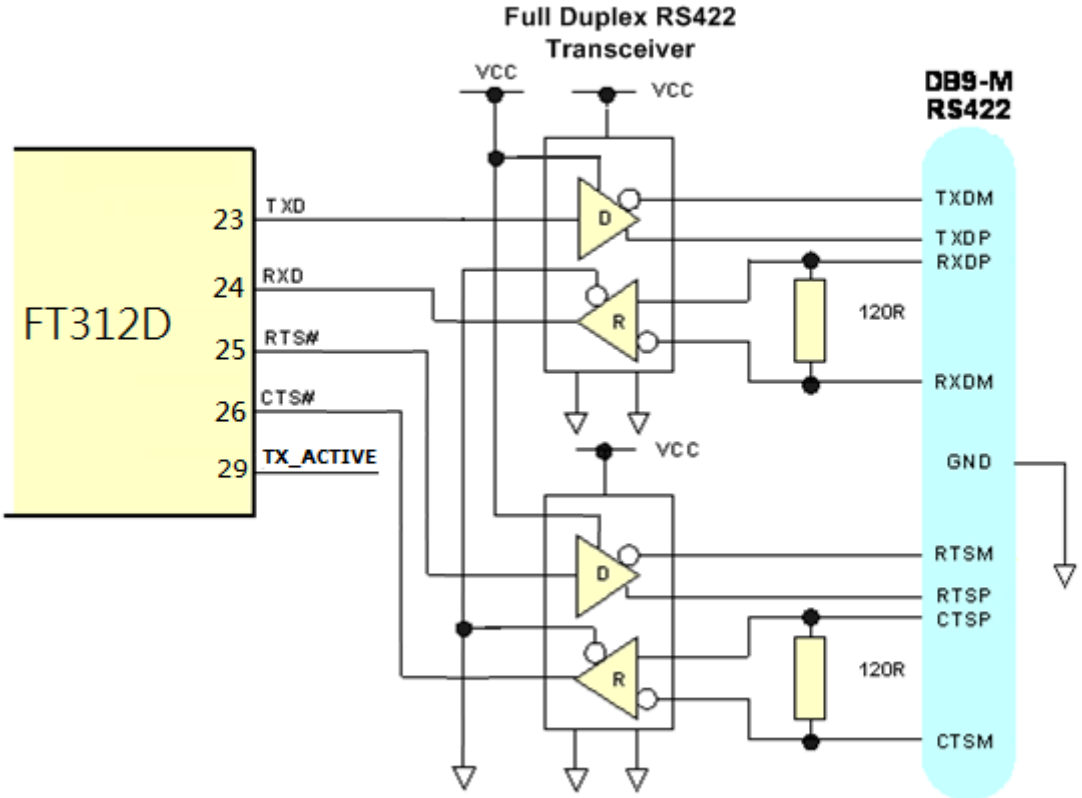

Figure 4 Application Example Showing USB to RS422

3 Reference Schematic

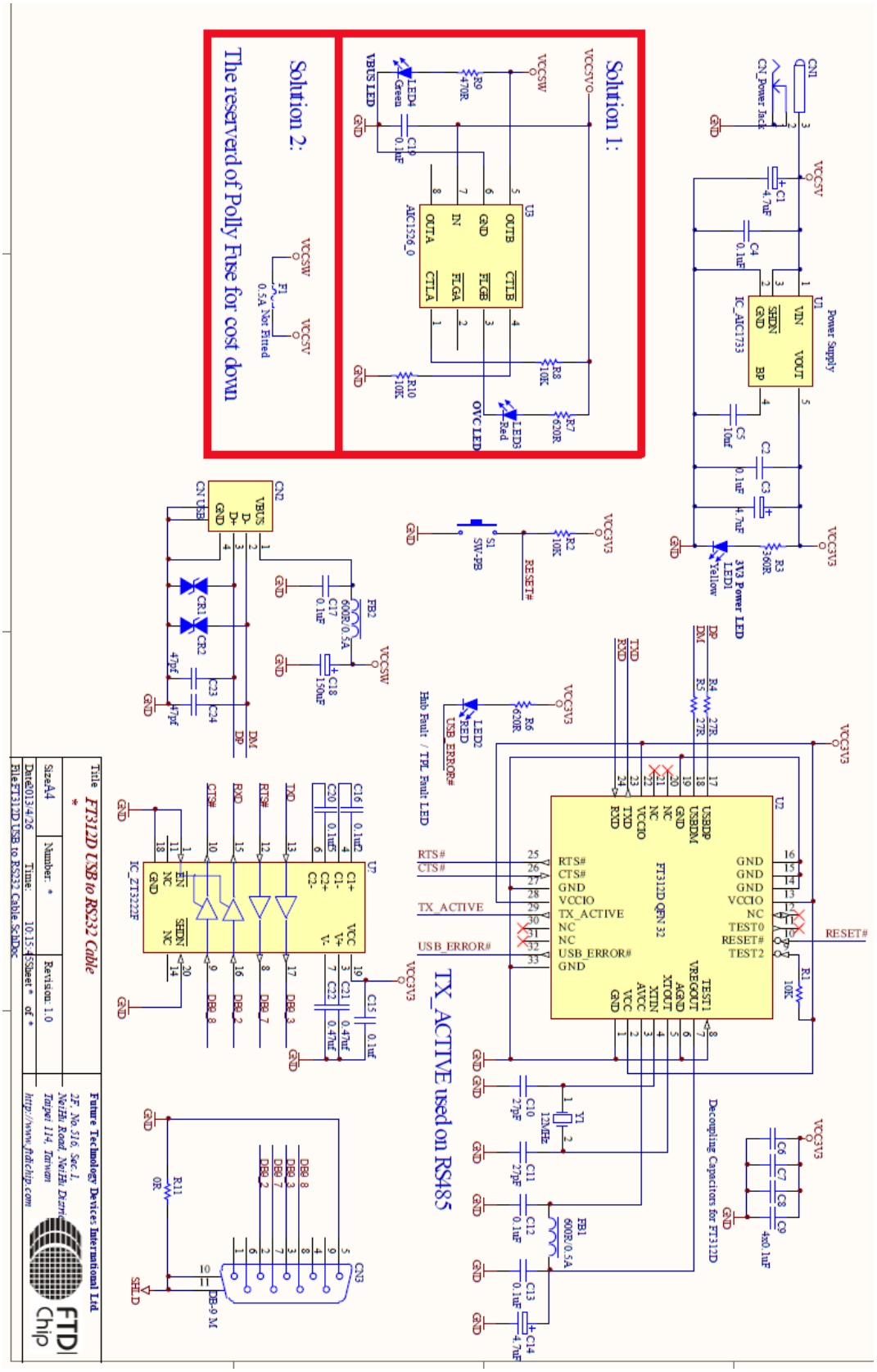

Figure 5 FT312D USB to RS232 Reference schematic

4 Manufacture Tool and Software Development

The manufacture configuration utility may be downloaded from:
http://www.ftdichip.com/Support/Utilities/FT312D_Configuration_V010000.zip

And the user guide, AN_236 User Guide for FT312D Configuration, is available for download at:
http://www.ftdichip.com/Support/Documents/AppNotes/AN_236_UserGuide_for_FT312D_Configuration_Utility.pdf

FTDI provide the Android Open Accessory Hyperterm utility via Google Play. Reference software is provided free of charge, as-is, with no warranties or guarantees.

https://play.google.com/store/search?q=pub:Future Technology Devices International Ltd

A complete user manual is available for download at:

http://www.ftdichip.com/Support/Documents/AppNotes/AN_241_FTDI_AOA_HyperTerm_User_Manual.pdf

- Critical: Note that the reference software and production version of the FT312D were developed so that the Android device strings correlate. If customers are interested in providing their own Hyper Terminal application software with addition feature and benefits, then it is critical that these strings correlate for proper functionality. Further reference material is provided below if designers choose this type of development.

A complete programmer guide, following the Standard Google Android Open Accessory Protocol is available for download at:
http://www.ftdichip.com/Support/Documents/ProgramGuides/FT31xD_Android_programmer_guide(FT_000532).pdf

FTDI also provide sample code for an Android Open Accessory application that may be downloaded from:

http://www.ftdichip.com/Support/SoftwareExamples/Android/Android.zip

http://www.ftdichip.com/Support/Documents/AppNotes/AN_208_FT31xD_Demo_APK_User_Guide.pdf

Additional reference material may also be found at the links below.

- Google Android Open Accessory ADK: http://developer.android.com/tools/adk/index.html
- FTDI Chip's Android Support Page: http://www.ftdichip.com/Android.htm

5 Acronyms and Abbreviations

Terms	Description
ADK	Accessory Development Kit
Android	Linux-based operating system designed primarily for touch screen mobile devices
AOA	Android Open Accessory
HyperTerm	COM Port Communication Tool
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial bus

Table 1 Acronyms and Abbreviations

6 Contact Information

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Appendix B - Revision History

Revision History

Version 1.0 Initial Release 21st May, 2013