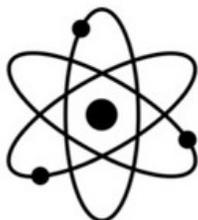


**DACMCU  
UART**



**DACMCU  
UART**

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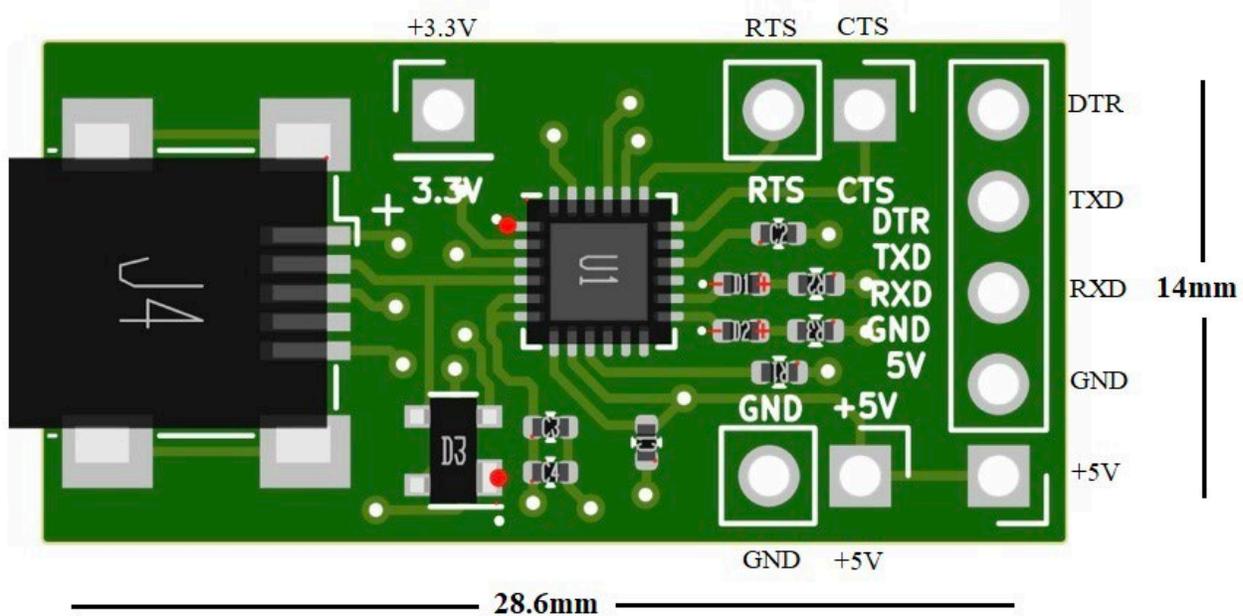
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## **CP2104 CHIP SYSTEM DESIGN by Silicon Labs**

- **CP2104 Chip System Diagram**

## INTRODUCTION:

This is a powerful Universal Asynchronous Receiver Transmitter(UART) USB to Serial breakout board. This communication protocol is designed to communicate with microcontrollers and other smart devices. This UART carries the CP2104 chip by Silicon Labs which is a highly-integrated USB-to-UART bridged controller, Arduino compatible with high baud rates of 300 bps to 2 Mbits transceiver speed. High compatibilities with fast upload speeds of 576 byte receive buffer and 576 byte transmit buffer. The CP2104 chip carries the fastest transceiver buffer speed in the CP210x series. This device is compatible with microcontrollers and IoT devices. This is a plug and play turn-key UART with all USB driver updates already installed!



## **SPECIFICATIONS:**

### **Asynchronous Serial Data BUS (UART)**

All handshaking and modem interface signals

Data formats supported: - Data bits: 5, 6, 7, and 8 - Stop bits: 1, 1.5,  
and 2 - Parity: odd, even, mark, space, no parity

Baud rates: 300 bps to 2 Mbits

576 byte receive buffer; 576 byte transmit buffer

Length 28.6mm x Width 14mm

### **Virtual COM Port Device Drivers**

Works with Existing COM Port PC Applications

Royalty-Free Distribution License

Windows 7®/Vista®/XP®/Server 2003®/2000®

Mac® OS-X

And all updated versions

### **Example CP2104 Applications**

Upgrade of RS-232 legacy devices to USB

Upgrade of RS-485 legacy devices to USB

Cellular phone USB interface cable

PDA USB interface cable

USB to RS-232 serial adapter

### **USB mini Type B connector**

**NOTE:** Royalty-free Virtual COM Port (VCP) device drivers provided by Silicon Labs allow a CP2104-based product to appear as a COM port to PC applications. The CP2104 UART interface implements all RS-232/RS-485 signals, including control and handshaking signals, so existing system firmware does not need to be modified.

## Global DC Electrical Characteristics

Digital Supply Voltage (VDD): 3.0 — 3.6 V or 5V

Digital Port I/O Supply Voltage (VIO): 1.8 — VDD V

Supply Current Normal Operation: 17.0 — 18.5mA

Supply Current Suspended: 100 — 200  $\mu$ A

Output Current +3.3V Pin: 1 to 500mA

Output Current +5V Pin: 500mA

**Notes:** **1.** If, the device is connected to the USB bus, the USB Pull-up Current should be added to the supply current for total supply current.

**2.** The USB Pull-up supply current values are calculated values based on USB specifications.

## **APPLICATIONS:**

- Arduino Microcontroller Devices(Pro-Mini)
- Microcontrollers
- IOT devices
- ESP32 Devices
- Smart Home Devices
- Reading & Writing Protocols

## **Asynchronous Serial Data Bus (UART) Interface**

This DACMCU UART interface consists of the TXD (transmit) and RXD (receive) data signals as well as the RTS, CTS, and DTR control signals. The UART supports RTS/CTS and DTR handshaking. The UART is programmable to support a variety of data formats and baud rates. When the Virtual COM Port drivers are used, the data format and baud rate are set during COM port configuration on the PC. The USBXpress drivers are configured through the USBXpress API.

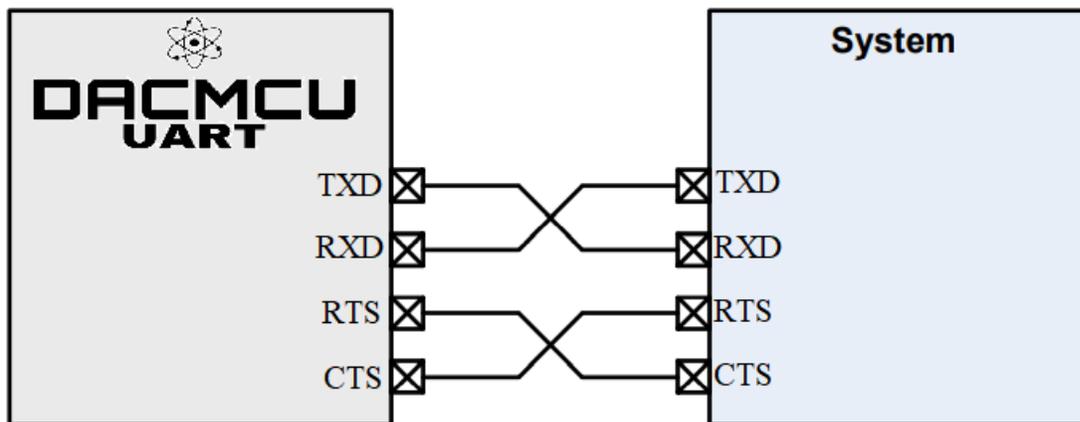
## **Baud Rate Generation**

The baud rate generator is very flexible, allowing the device to request any baud rate in the range from 300 bps to 2 Mbps. If the baud rate for your device cannot be directly generated from the internal 48 MHz oscillator, the device will choose the closest possible option.

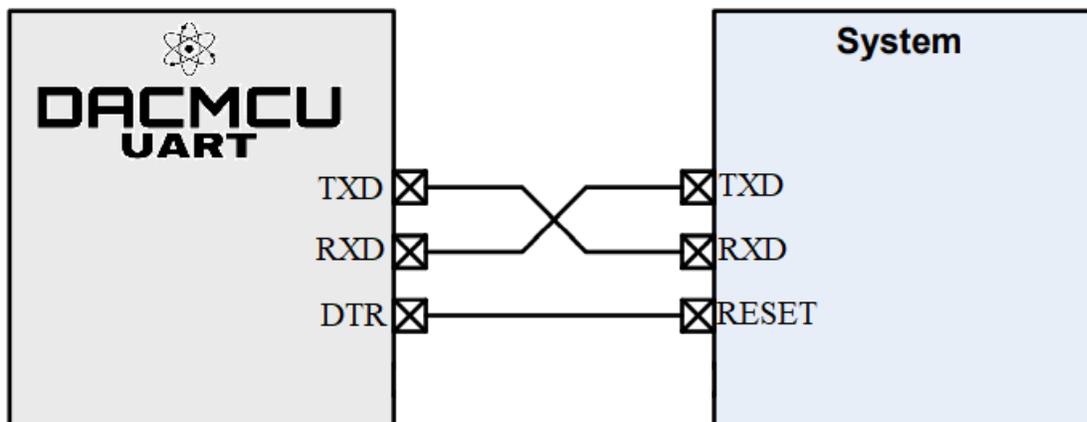
## **Hardware Flow Control (RTS, CTS and DTR)**

To utilize the functionality of the RTS and CTS pins of the CP2104, the device must be configured to use hardware flow control. RTS, or Ready To Send, is an active-low output from the CP2104 and indicates to the external UART device that the CP2104's UART RX FIFO has not reached the watermark level of 383 bytes and is ready to accept more data. When the amount

of data in the RX FIFO reaches the watermark, the CP2104 pulls RTS high to indicate to the external UART device to stop sending data. CTS, or Clear To Send, is an active-low input to the CP2104 and is used by the external UART device to indicate to the CP2104 when the external UART device's RX FIFO is getting full. The CP2104 will not send more than two bytes of data once CTS is pulled high. A DTR system configuration connects to the reset pin via 100nf ceramic capacitor for pull-down, brown-out capabilities, grounding the system with negative voltage for read/write protocols.



**Hardware Flow Control Typical Connection Diagram**



**Hardware Flow Control Typical Connection Diagram**

## CP2104 CHIP SYSTEM DESIGN by Silicon Labs

This DACMCU UART incorporates the CP2104 UART chip from Silicon Labs as its main functional component for easy handshaking while programming smart devices.

