

# ON Semiconductor

## Is Now

# onsemi™

To learn more about onsemi™, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

---

**onsemi** and **onsemi** and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi** product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner. Other names and brands may be claimed as the property of others.



Tel: 207-775-8100  
 Tel: 800-341-0392 (outside Maine)  
 Tel: 800-832-5505 (inside Maine)

**Fairchild Semiconductor**  
 82 Running Hill Road  
 South Portland, ME 04106

## FUSB301A Evaluation Board Users Guide

Version 2.1  
 January, 2016

### Introduction

The FUSB301A is an autonomous USB Type-C controller device designed to negotiate the Type-C interface connections. This document along with the FUSB301A datasheet are a guide to using the evaluation board designed for this device.

The FUSB301A is designed to be controlled from an application processor so for demonstration purposes a microcontroller has been added to the board for convenient chip control and graphical user interface (GUI). Fairchild will supply this GUI to assist in the Evaluation of the FUSB301A. If no GUI control is available the FUSB301A will boot up in UFP mode.

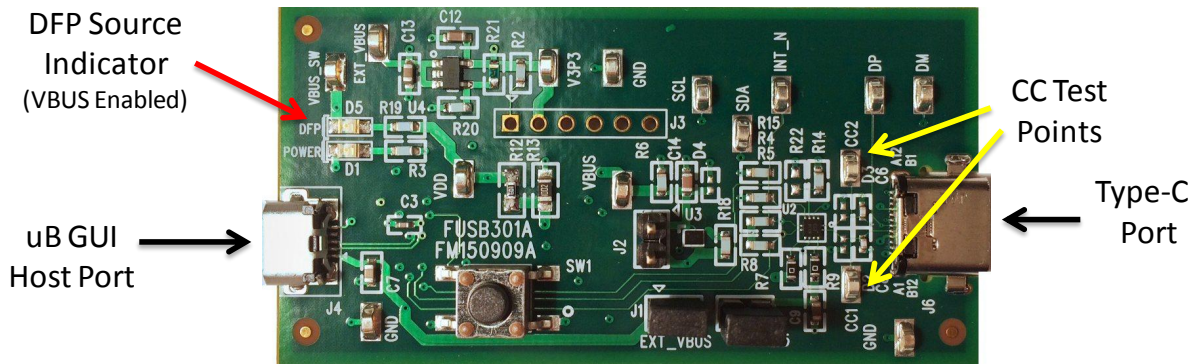


Figure 1 - FUSB301A Evaluation Board

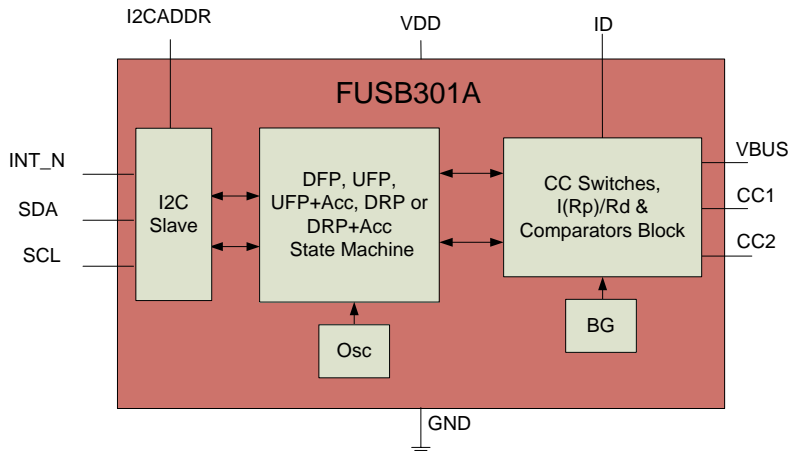
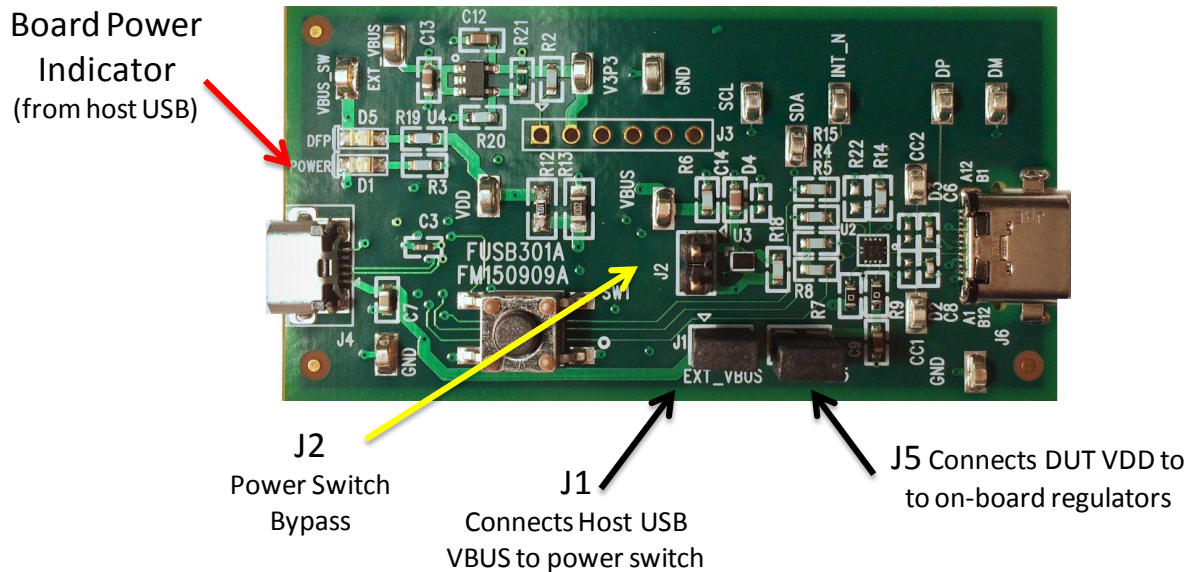


Figure 2 - FUSB301A Block Diagram

## Power

The board can be powered directly from the GUI host USB connection or from bench power supplies for those that would like to alter the VDD voltage. VDDIO is tied to the VDD regulator fixed at 3.3V. Connecting jumper J5 connects the host USB VBUS to the on-board regulators. Jumpers J1 and J5 are connected by default to operate the board directly from the host USB controller VBUS. When DFP mode is entered the ID pin of the FUSB301A will go low and turn on the *FPF2411* power switch. If a bench supply is desired, removal of the J5 jumper and clip leads from the supply should be connected to J5, pin 1 and GND.

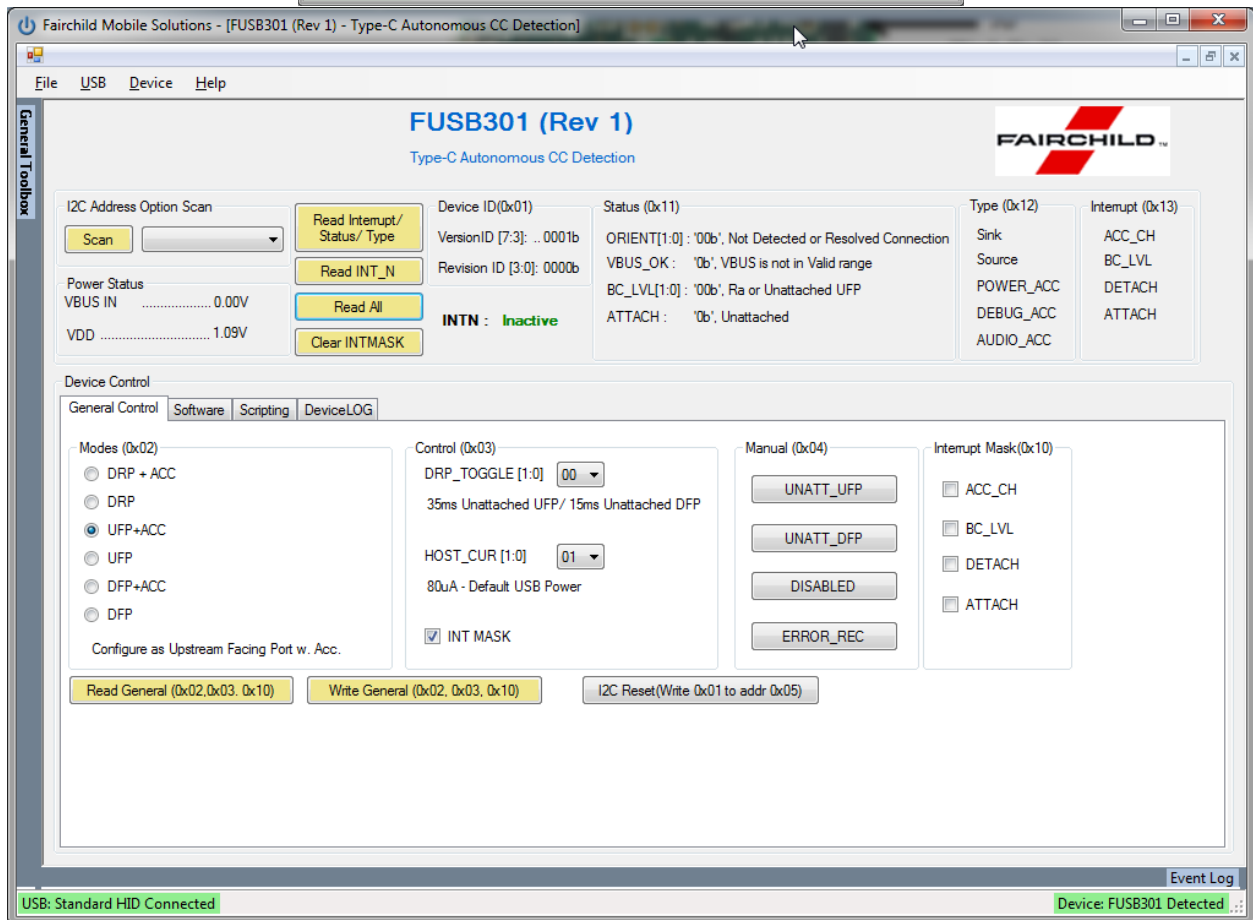
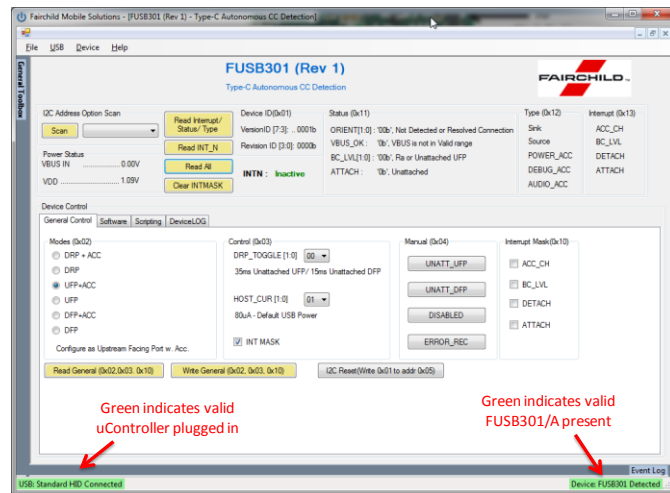


**Figure 3 - FUSB301A Evaluation Board Power Configuration**

There are many test points on the board for probing convenience. They are labeled on the board and schematic. There are also provisions for changing or upgrading the processor firmware. This can be done either with the 6 pin header (J3) or from a direct USB connection from the J4 host port (switch SW1 must be temporarily pressed while plugging in the USB cable to enable the bootloader (specific instructions will be included with any firmware changes).

## FUSB301A GUI Control Program

Along with the board schematic and product datasheets Fairchild will provide a GUI program to control the board operation. All of the device features can be observed or exercised from this control point. Installing the software is accomplished by running the setup.exe program provided. This install will load the required executables, binaries and Microsoft Framework files (if not already installed). The GUI is based on an HID driver (native to Windows) so loading additional drivers is not necessary. The following is a description of how to run the GUI.

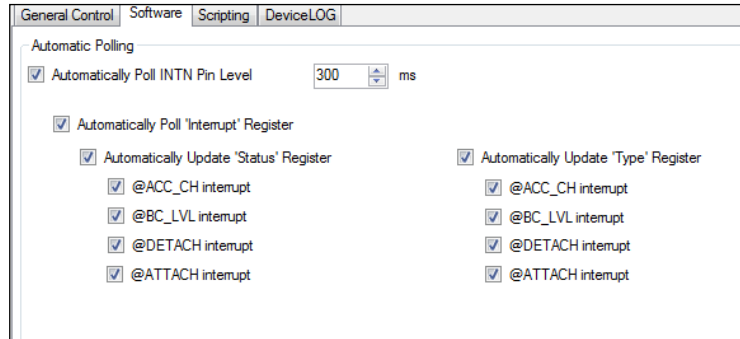


The top half of the window is for device and interrupt status, the tab control at the bottom is for setting up the various operating conditions of the FUSB301A. After successful board connection and power up the status field should indicate the current condition of the device. If the I2CADDR pin of the device has been changed from default, clicking on the 'Scan' button will find the appropriate I2C address of the device. *Note the two green status boxes at the bottom corners, they are pink in color when not successfully connected.*

The 'General Control' tab will default to 'UFP+ACC' mode which will allow a type-c cable to be plugged into a valid DFP or DRP device on one of the CC pins. The status box will show the connection

status. When making changes in the tab controls it is generally required to click on the ‘Write General’ button to actually write the changes to the device. Clicking the ‘I2C Reset’ will return the device to power-up state. Referring to the datasheet will help in navigation of this GUI. Clearing the INT MASK check box, then ‘Write General’ will enable the FUSB301/A to respond with interrupts (masking all interrupts is the power-up default).

The ‘**Software**’ tab sets up the polling that is done to update the GUI. This polling activity can mimic what an application processor would normally do.



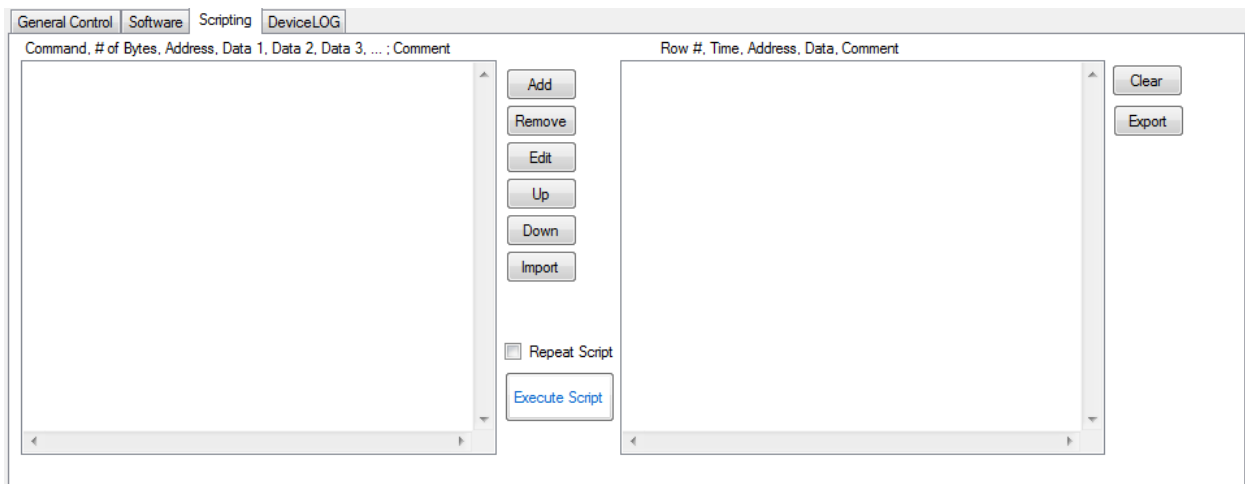
The **‘Scripting’** tab is a convenient way to make many changes to any of the registers. This is handy when running repetitive tasks or recalling setups. The text at the top of the frame describes the syntax for the scripts:

The **‘Scripting’** tab enables the use of scripts to configure the FUSB301A.

The window in the left side of the tab controls the scripting. The control has the following functionality:

- Read through "r", "rd", "read"
- Write through "w", "wr", "write"
- Delay in milliseconds through "d", "del", "delay"
- Pause through "p", "pa", "pause"

Scripts can be added through the GUI using the **‘Add’** button or imported from an external file using the **‘Import’** button. Individual lines can be reordered through the **‘Up’** and **‘Down’** buttons, edited through the **‘Edit’** button, or deleted with the **‘Remove’** button. After achieving a desired setup, a script can also be exported to a file.



An example script could be: `w,1,0x02,0x01 ; ### Set device to DFP mode ###`

*w=write*

*1 byte*

*Address 0x02*

*Data 0x01*

*Comment*

Results of an executed script are shown in the box on the right side of the tab. These results can be exported to a file.

The **‘Device Log’** tab keeps track of all the interrupt activity and can be controlled and exported from this tab.



