CY3240-I2USB

I2C-USB Bridge Guide

Doc. # 001-66660 Rev.**

Cypress Semiconductor
198 Champion Court
San Jose, CA 95134-1709

Phone (USA): 800.858.1810
Phone (Intnl): 408.943.2600
http://www.cypress.com

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Contents

1. Introduction

Thank you for your interest in the CY3240-I2USB Kit. The CY3240-I2USB can be used with the Bridge Control Panel that is installed with PSoC Programmer. The kit is designed to test, tune, and debug programs that have an I2C slave interface. This document describes the working of CY3240 and includes example projects, which will help you get started with the bridging tool. You can also develop custom programs using PERL, Python, C++, and C# languages. These custom applications allow generating complex testing, debugging, and validation systems using PSoC Programmer COM.

You can evaluate the kit using the example projects provided with the kit. The example projects help to:

- Explore I2C-USB communication between the PC and slave interfaced via I2C slave interface connector of the bridge
- Customize the designs provided along with the kit

The CY3240 I2C-USB Bridge board is configured with the I2C-USB Bridge Board example project when shipped. See Chapter 5 for more details.

Chapter 2 of this document describes the installation and configuration of CY3240-I2USB. Chapter 3 explains the programming of a PSoC 1 device with PSoC Programmer and how to use the kit with the help of an example project. Chapter 4 describes the hardware operation. Chapter 5 provides instructions to create a simple example project. The Appendix section provides the schematics and BOM for the CY3240-I2USB kit.

Evaluate the sample projects provided with the kit and then experiment with the kit hardware and software to create your own designs.

1.1 Kit Contents

The CY3240-I2USB Bridge Kit contains:

- I2C-USB Bridge
- I2C demo target board
- USB A to Mini B cable
- CY3240-I2USB kit CD

Inspect the contents of the kit. If any parts are missing, contact your nearest Cypress sales office for further assistance.

1.2 Bridge Control Panel Software

Bridge Control Panel is installed along with PSoC Programmer and enables the bridge to communicate with the PC. It is used to send and receive data from the device connected to the bridge.

1.3 Additional Learning Resources

Visit www.cypress.com for additional learning resources in the form of data sheets, technical reference manual, and application notes.

- Application Note - Using Cypress I^2C Port Expander with Flash Storage: http://www.cypress.com/?rID=2694
- PSoC CY8C24894 - Features and Chip functionality: http://www.cypress.com/?rID=37765
- PSoC CY8C21123 - Features and Chip functionality: http://www.cypress.com/?rID=3335
- For more information regarding PSoC Designer functionality and releases: www.cypress.com/go/psocdesigner
- For more information regarding PSoC Programmer, supported hardware and COM layer: www.cypress.com/go/psocprogrammer
- For a list of PSoC Designer-related trainings: http://www.cypress.com/?rID=40543

1.4 Document History

Revision	PDF Creation Date	Origin of Change	Description of Change
**	01/25/2011	RKPM	Initial version of kit guide

1.5 Documentation Conventions

Table 1-1. Document Conventions for Guides

Convention	Usage
`Courier New`	Displays file locations, user entered text, and source code: `C:\ ...cd\icc\`
Italics	Displays file names and reference documentation: Read about the *sourcefile.hex* file in the *PSoC Designer User Guide*.
[**Bracketed, Bold**]	Displays keyboard commands in procedures: [**Enter**] or [**Ctrl**] [**C**]
File > Open	Represents menu paths: File > Open > New Project
Bold	Displays commands, menu paths, and icon names in procedures: Click the **File** icon and then click **Open**.
Times New Roman	Displays an equation: 2 + 2 = 4
Text in gray boxes	Describes cautions or unique functionality of the product.

2. Getting Started

This chapter describes the installation and configuration of CY3240-I2USB.

2.1 CD Installation

To install the kit software, follow these steps:

1. Insert the kit CD into the CD drive of your PC. The CD is designed to auto-run and the kit installer startup screen appears.

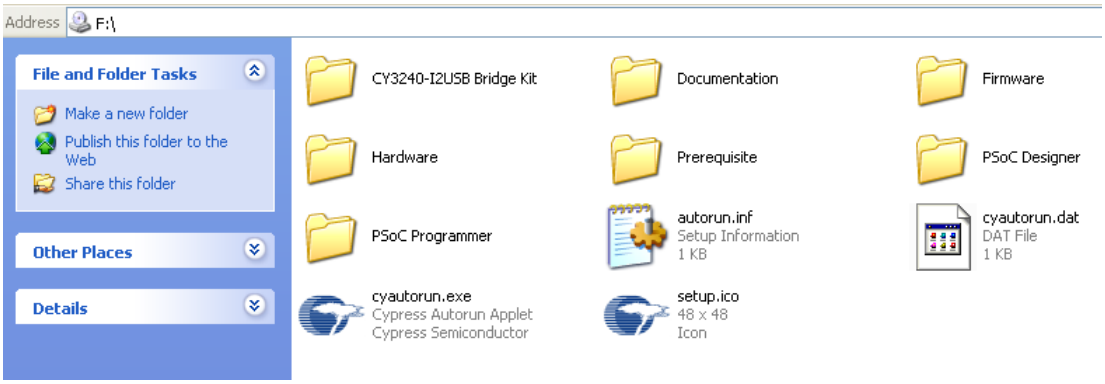
   Note You can also download the latest kit installer from http://www.cypress.com/go/CY3240-I2USB. Download the ISO file and create an installer CD or extract the ISO using WinRar and install the executables.

2. Click **Install CY3240-I2USB Bridge Kit** to start the installation, as shown in Figure 2-1.

   Figure 2-1. CY3240-I2USB Menu

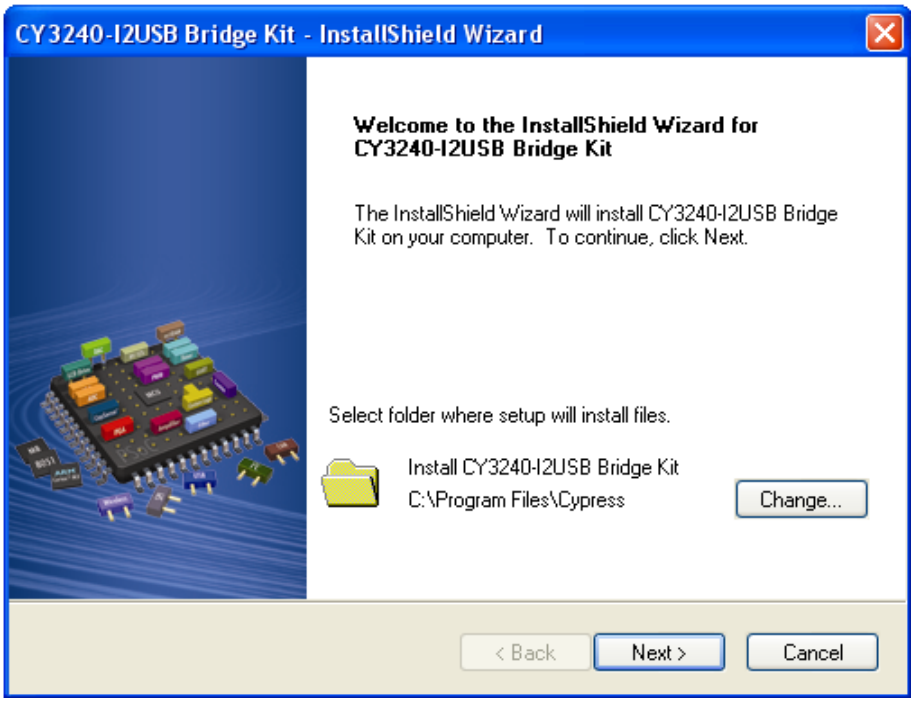
Note If auto-run does not execute, double-click *cyautorun.exe* file on the root directory of the CD, as shown in Figure 2-2.

Figure 2-2. Root Directory of CD



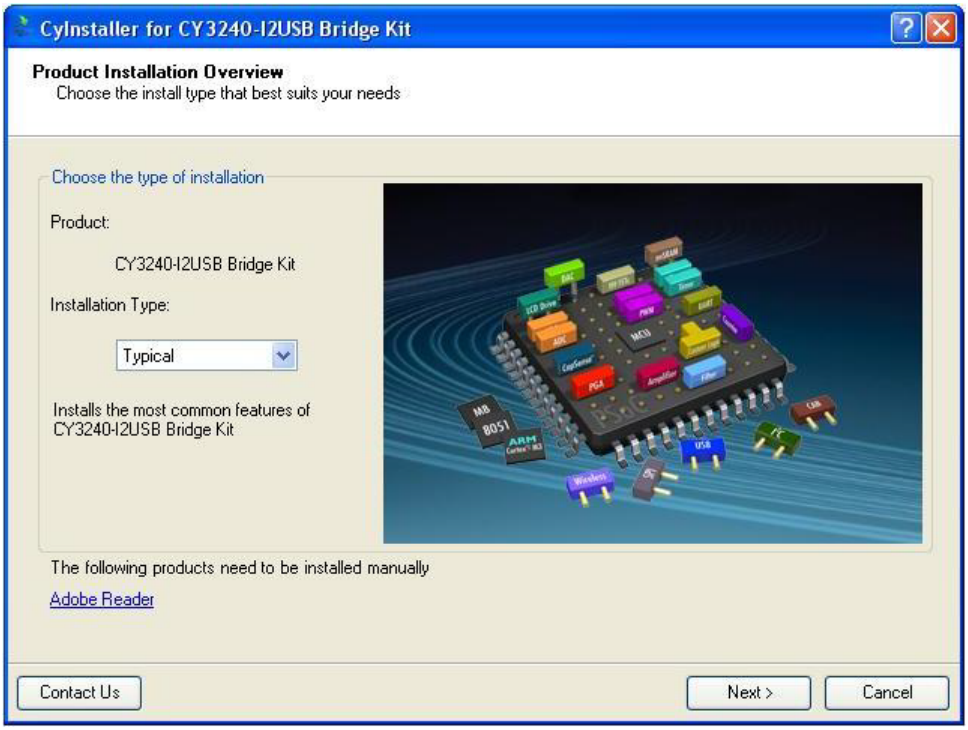
3. On the startup screen, click **Next** to start the installer.
4. In the **InstallShield Wizard**, choose the folder location to install the setup files. You can change the location of the folder for the setup files using **Change**, as shown in Figure 2-3.
5. Click **Next** to launch the installer.

Figure 2-3. InstallShield Wizard



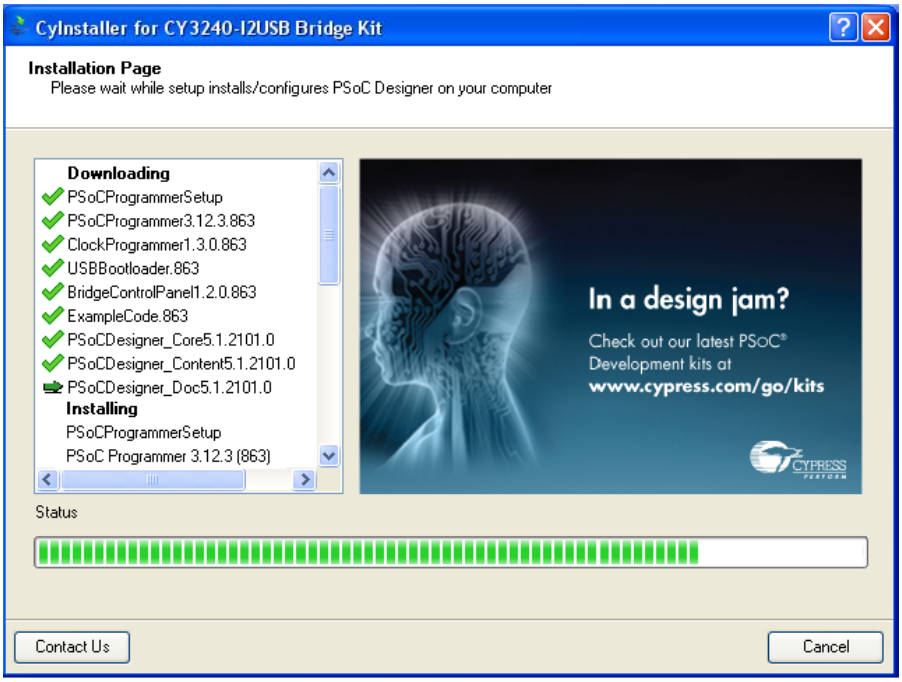
6. On the **Product Installation Overview** screen, select the installation type that best suits your requirement. The drop-down menu has three options: **Typical**, **Complete**, and **Custom**, as shown in Figure 2-4.
7. Click **Next** to start the installation.

Figure 2-4. Installation Type Options



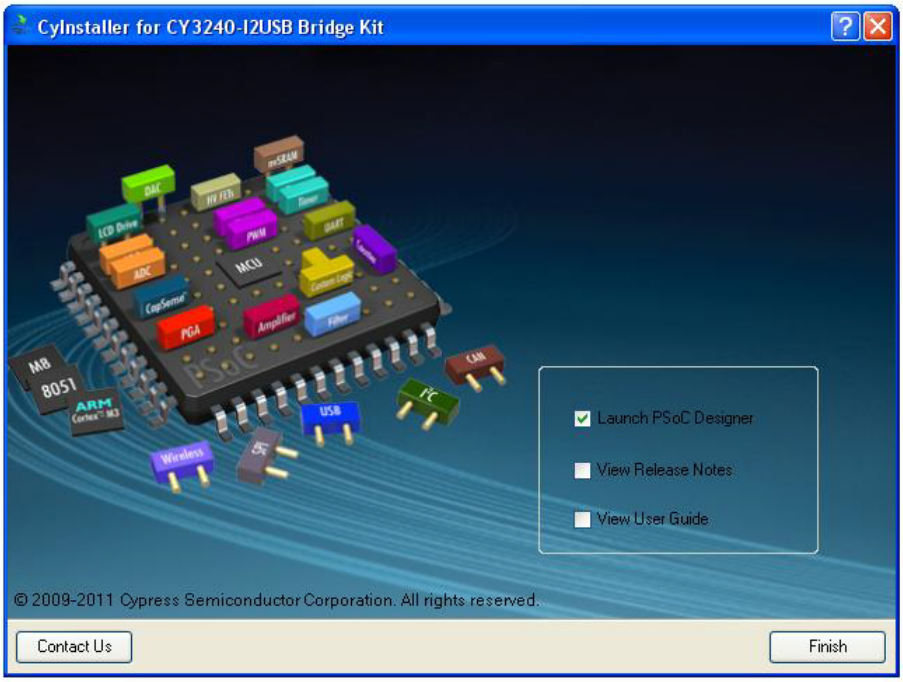
8. When the installation begins, a list of packages appears on the **Installation Page**.
9. A green checkmark appears against every package that is downloaded and installed, as shown in Figure 2-5.
10. Wait until all the packages are downloaded and installed successfully.

Figure 2-5. Installation Page



11. Click **Finish** to complete the installation, as shown in Figure 2-6.

Figure 2-6. Installation Complete Page



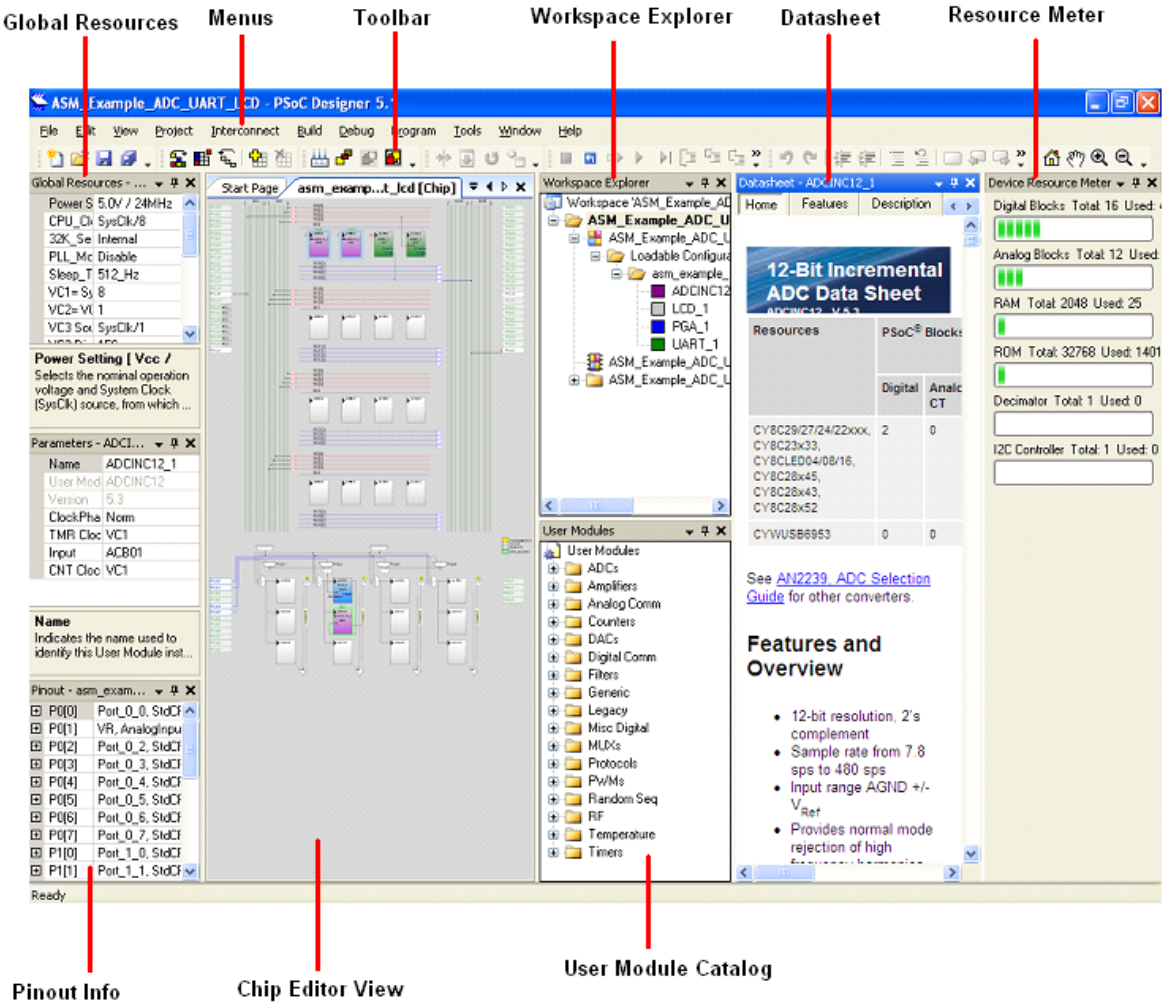
After the software installation, verify that you have all hardware and drivers set up for the I2C-USB kit by connecting the bridge to your PC via its USB interface. Because this is the first time you have connected this board to the PC, initial drivers are installed. Follow the instructions to complete the installation process. Also, verify your installation by opening PSoC Programmer with the kit board attached to USB.

2.2 PSoC Designer

PSoC Designer 5.1 is the revolutionary integrated design environment (IDE) that helps to customize PSoC to meet specific application requirements. PSoC Designer software accelerates system bring-up and time-to-market.

- To open PSoC Designer, click **Start** > **Programs** > **Cypress** > **PSoC Designer 5.1** > **PSoC Designer 5.1**
- To create a new project, click **File** > **Create New Project**
- To open an existing project, click **File** > **Open**
- To experiment with the example projects, go to Example Projects on page 31

Figure 2-7. PSoC Designer Interconnect View



Note For more details on PSoC Designer, see the PSoC Designer IDE Guide located at: `<InstalledDirectory>:\Cypress\PSoC Designer\<version>\Documentation`.

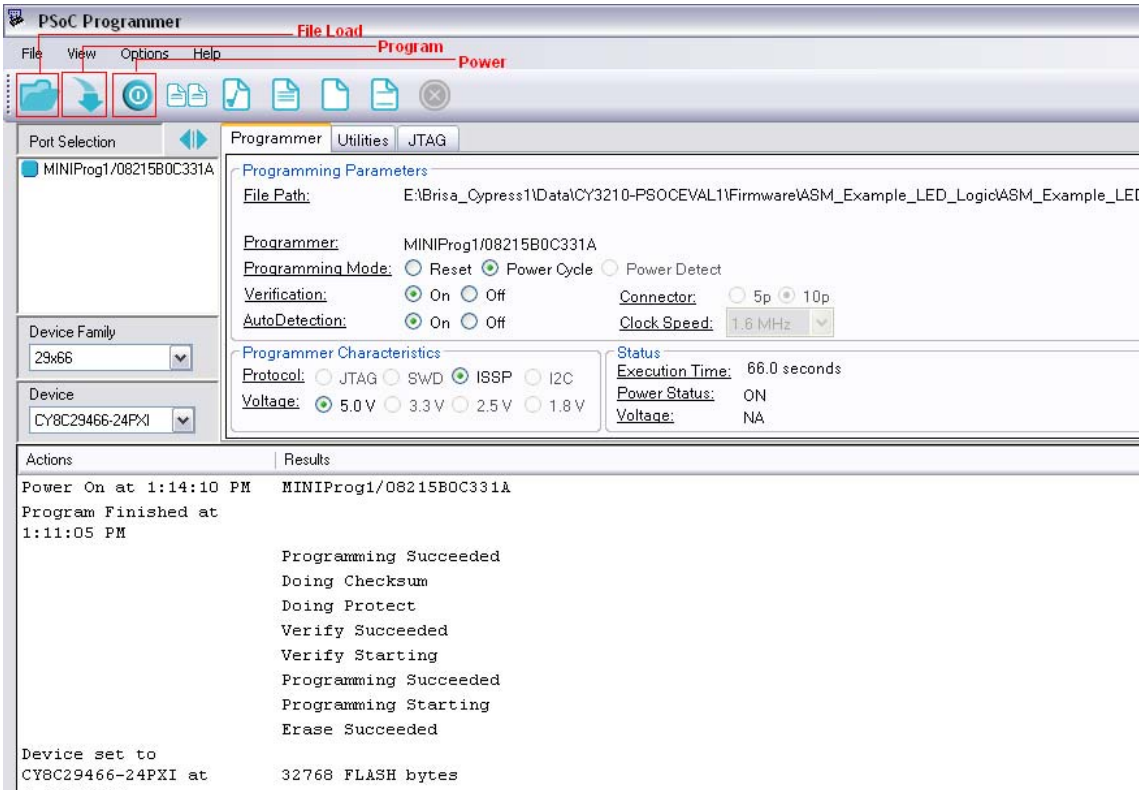
2.3 PSoC Programmer

To open PSoC Programmer, click **Start** > **Programs** > **Cypress** > **PSoC Programmer 3.12** > **PSoC Programmer 3.12**.

To successfully program the device, follow these steps:

1. Select the I2C-USB bridge in **Port Selection**, as shown in Figure 2-8.

   Figure 2-8. PSoC Programmer Window



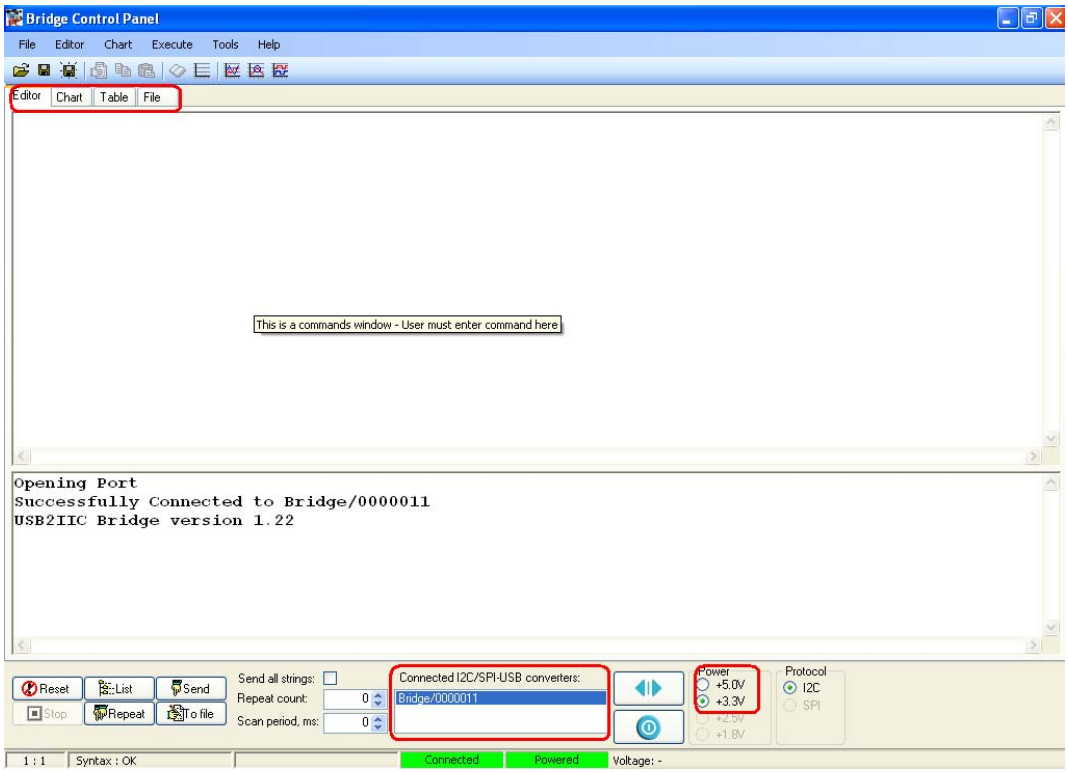
2. Click the **File Load** button to load the hex file.
3. Click the **Program** button to program the hex file on the chip.
4. Close PSoC Programmer.

2.4 Bridge Control Panel

The Bridge Control Panel is used with CY3240 I2C-USB Bridge to enable communication with I2C slave devices. This program is used to configure I^2C devices and also to acquire and process data received from I2C slave devices. The Bridge Control Panel helps in optimizing, debugging, and calibrating the target application.

1. Click **Start > Programs > Cypress > Bridge Control Panel 1.2 > Bridge Control Panel**
2. Select **Power Supply**, as highlighted in Figure 2-9.
3. Select the port connectivity.

Figure 2-9. Selecting the Bridge



Note For more information, go to **Bridge Control Panel > Help > Help Contents**.

2.5 Install Hardware

No hardware installation is required for this kit.

3. Kit Operation

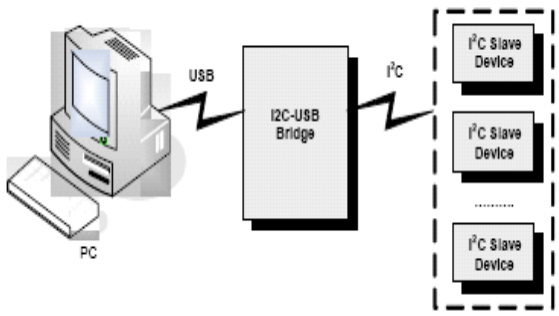
3.1 Introduction

The device meets the requirements of I2C Specification for standard and fast speed I^2C devices, and supports USB HID devices. The bridge is powered by the USB and consumes less than 500 mA. The device can be configured for several I^2C clock rates such as 50 kHz, 100 kHz, and 400 kHz.

The number of devices that can be connected is constrained only by the I^2C address limit and physical ability of the I^2C bus. For more details, see the I2C Specifications.

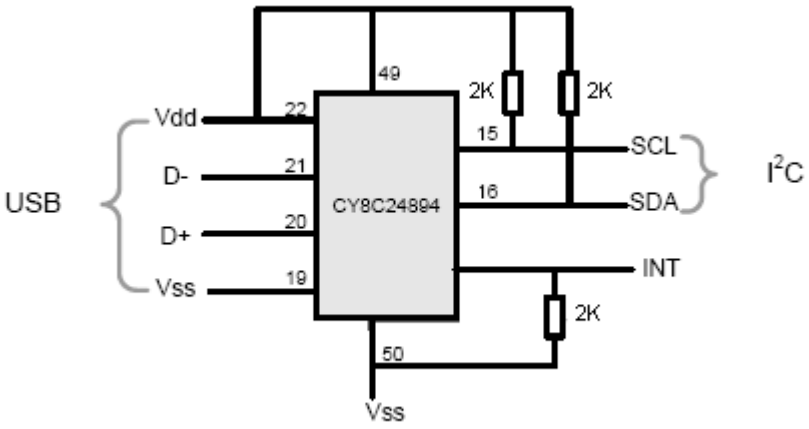
The USB communication function uses two 64-byte packets: one for input data flow and the other for output data flow. The maximum bandwidth of this configuration is 64 bytes. This is sufficient for most I2C-USB bridge applications (Figure 3-1).

Figure 3-1. I2C-USB Bridge



3.2 Connect Bridge to Device

Figure 3-2. Bridge to Device Connection

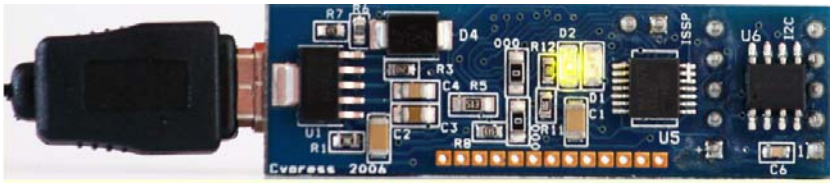


Perform the following steps to connect the device to I2C-USB bridge, as shown in Figure 3-2:

1. Connect GND of the device to GND of the bridge.
2. Connect the SDA and SCL lines to the bridge.

   Bridge has 2.2 k pull-up resistors connected to +5 V. The INT pin is a pull-down bidirectional pin that can be used as an additional signal between the bridge and I^2C slave device for functions such as sleep mode control.
3. Power the device from the Vdd pin on the bridge, if it does not have its own power supply. Note that the Vdd connection between the bridge and target board is required, even if the board is self-powered. Optionally, the bridge can provide 3.3 V or 5 V, or work with an externally powered board using 2.4 V to 5.6 V.
4. When the connection between the bridge and USB is successful, the LED (green) lights up, as shown in Figure 3-3.

   Figure 3-3. Connecting Bridge to USB.

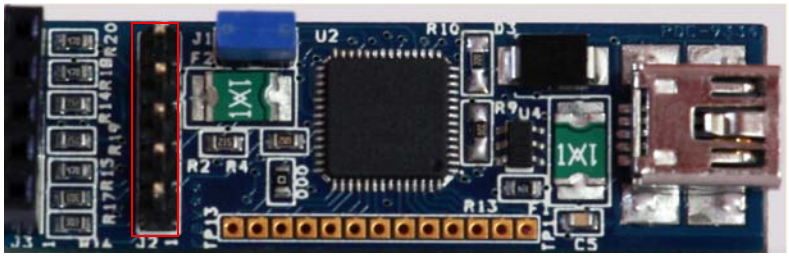


5. Open the Bridge Control Panel from the PC to work with the bridge.

3.2.1 Program I2C-USB Bridge

The CY3240 I2C-USB Bridge can be programmed using a MiniProg at the programming header of the bridge. To use MiniProg, use the ISSP Programming Header (J2) on the board as highlighted in Figure 3-4.

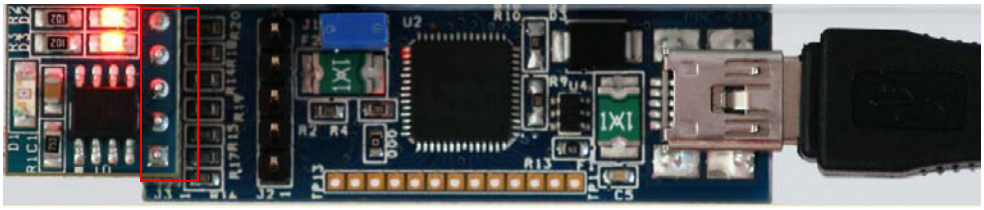
Figure 3-4. ISSP Programming Header



3.3 Connect Demonstration Board to Bridge

1. Connect I2C slave demonstration board to bridge, as shown in Figure 3-5.

   Figure 3-5. Demonstration Board and Bridge Connection



2. Select **+5V** as power supply to the board from Bridge Control Panel. The LED (red) on the bridge board lights up, as shown.

   Figure 3-6. LED (Red) on the Bridge Board

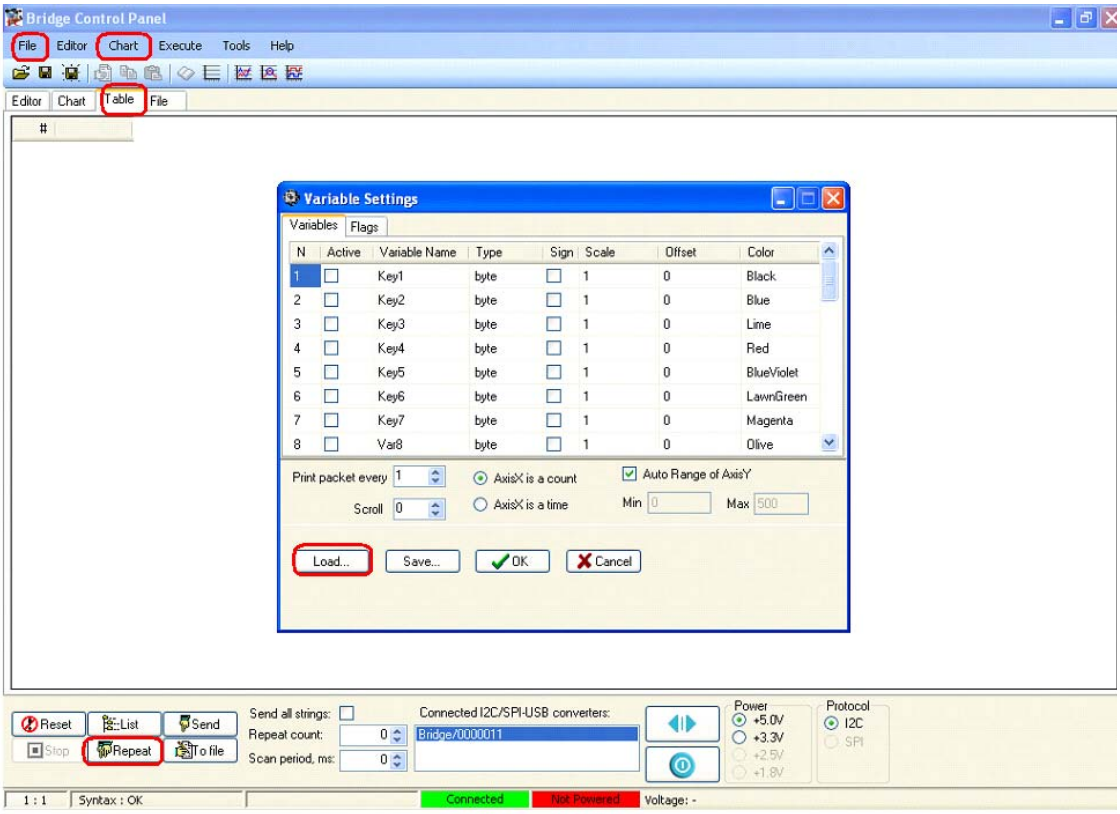
3. Click **List**; the bridge will find I2C slave demonstration board at 0x00 address.

3.3.1 Run Demonstration Board Test

The demonstration board has built-in temperature sensor and photodiode. The measurement results of these are sent over I^2C.

1. Open the **Variable Setting** dialog box from the **Chart** menu.

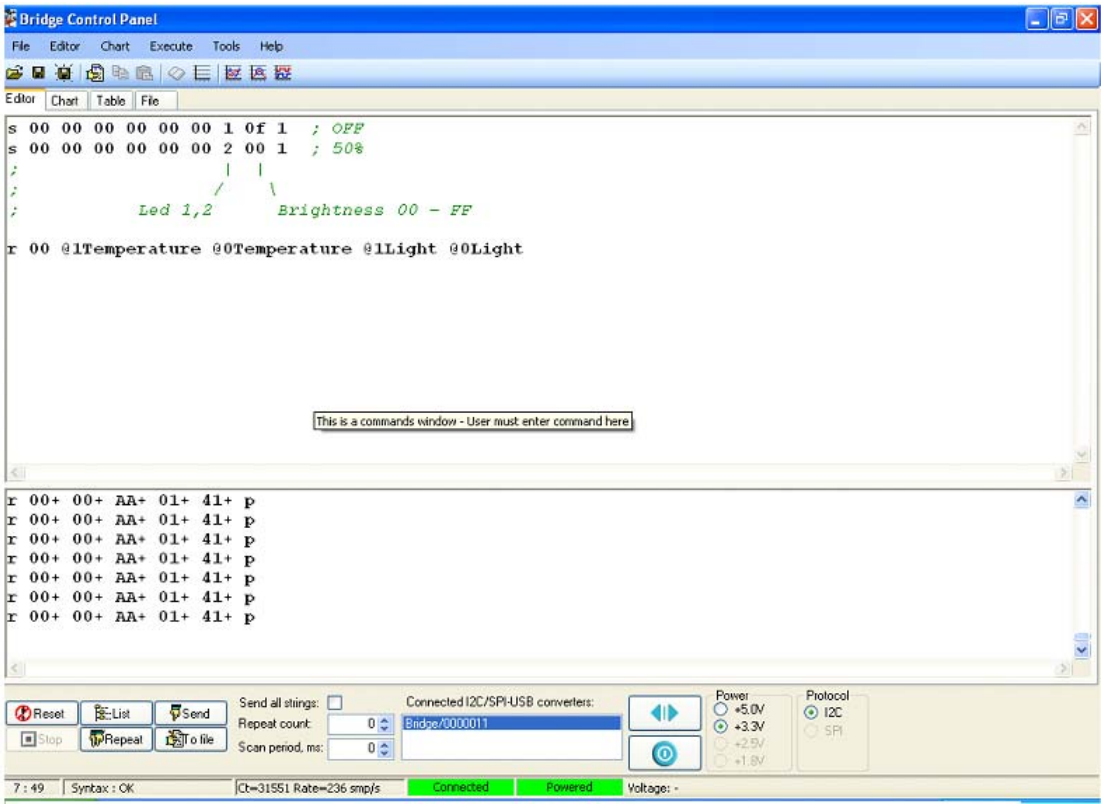
Figure 3-7. Variable Setting Box



2. Load the *demo.ini* file by clicking the **Load** button, as shown in Figure 3-7. The *demo.ini* file initializes light and temperature variables and is available in the CY3240-I2USB kit CD or at the following location: `<Installed_directory>:\Cypress\CY3240-I2USB.`
3. Load *demo.iic* file for iic commands that can be sent to demo target board; the *demo.iic* file is available in the CY3240-I2USB kit CD or at the following location: `<Installed_directory>:\Cypress\CY3240-I2USB`

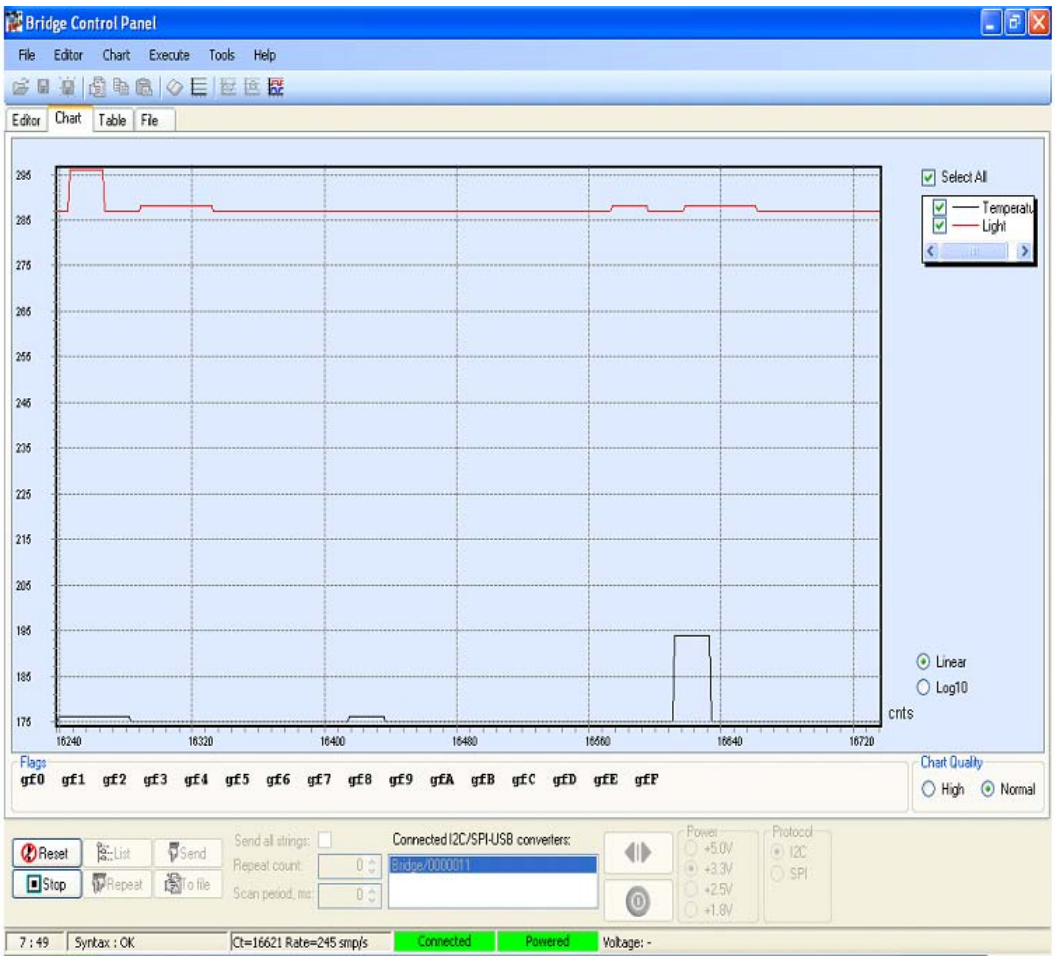
   Go to **File** > **Open File > demo.iic** to select the file.
4. The first two lines in the demo.iic file show how to control the LEDs on the board. Position the cursor in the first line and press **[Enter]** to send the command. Repeat for the second command line. Observe that, on sending the first command, the LED1 turns off. The second command reduces the LED intensity by 50 percent.

Figure 3-8. Bridge Control Panel Editor Screen View



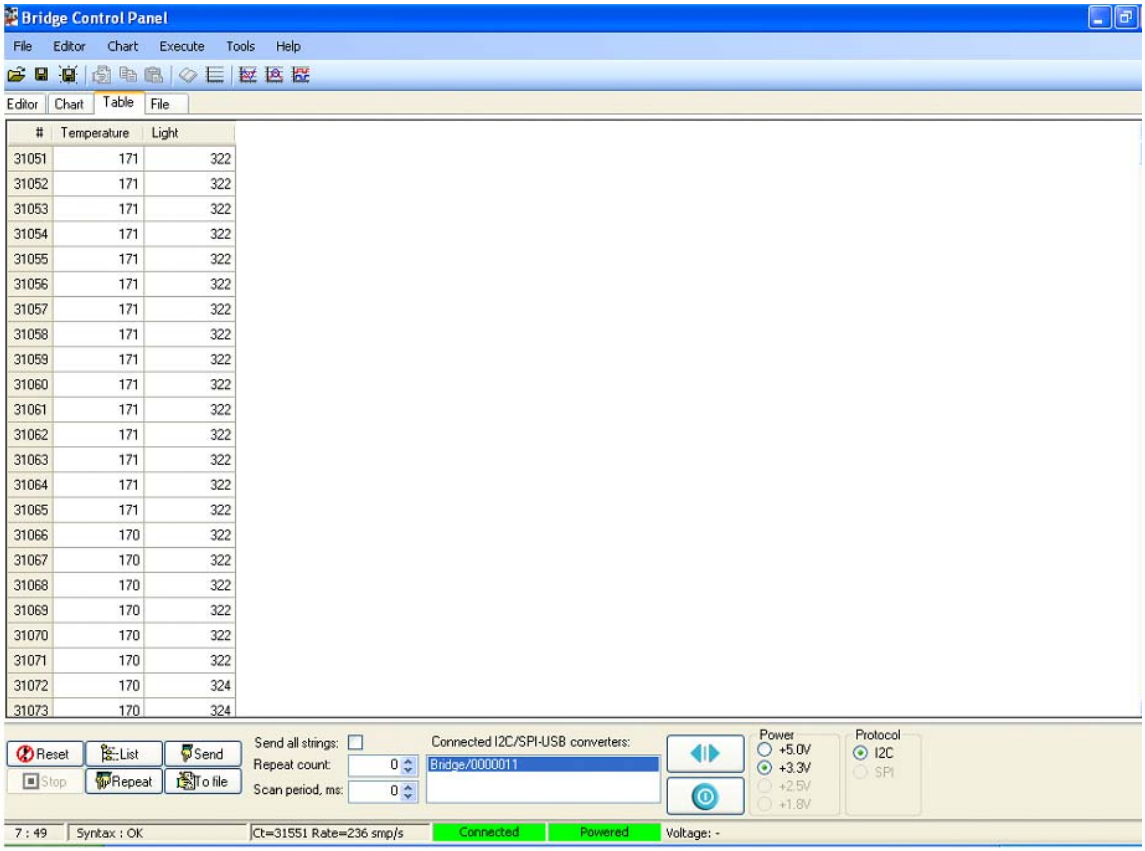
5. Click in the last line, which reads temperature and light data from the device and then click the **Repeat** button. On clicking **Repeat**, the command that is sent last is repeated until **Stop** is clicked. This makes data collection easier. The data received from slave can be viewed either graphically or in a tabular form.
6. Click the **Chart** tab to view data graphically, as shown in Figure 3-9.

Figure 3-9. Bridge Control Panel Graphical Screen View



7. Click the **Stop** button to stop scanning.
8. Click the **Table** tab to view data in a tabular form, as shown in Figure 3-10.

Figure 3-10. Bridge Control Panel Tabular Screen View



The **File** menu has these options:

- **Save Send Data** - To save the data sent to the demo target board from Bridge Control Panel.
- **Save Receive Data** - To save received data shown on the status window of Bridge Control Panel.

Go to **Bridge Control Panel Help** from the **Help** menu for more information on the Bridge Control Panel and iic command format.

4. Hardware

4.1 System Block Diagram

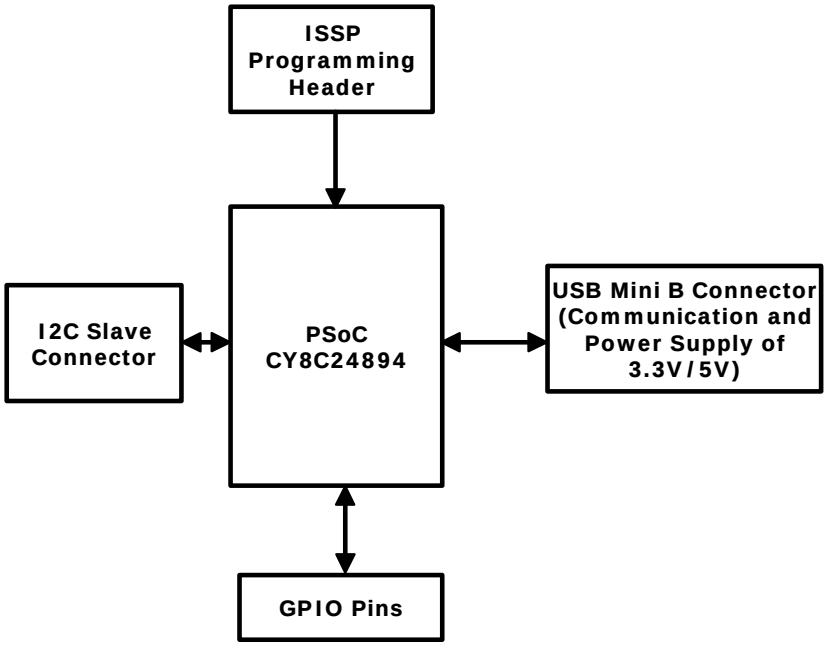
The CY3240-I2USB kit has two boards:

- I2C-USB Bridge board
- Demo target board

I2C-USB Bridge board consists of:

- PSoC CY8C24894 chip
- USB Mini B connector
- ISSP programming header.
- GPIO pins
- I2C slave interface connector

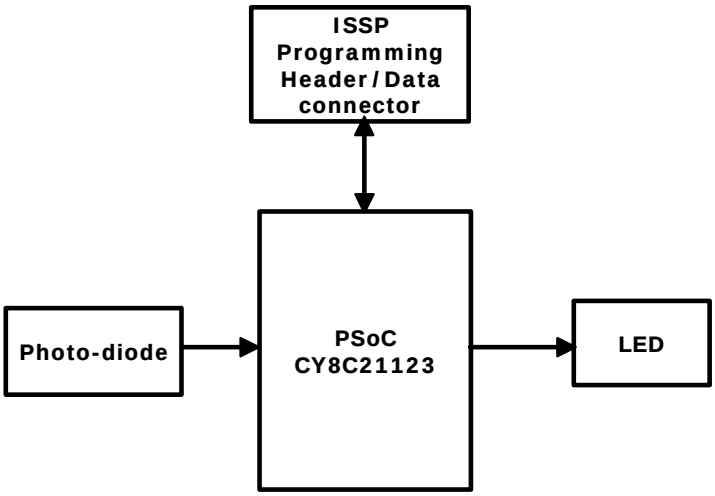
Figure 4-1. I2C-USB Bridge Board



Demo target board consists of:

- CY8C21123 chip
- LED
- Photodiode
- ISSP programming header/data connector

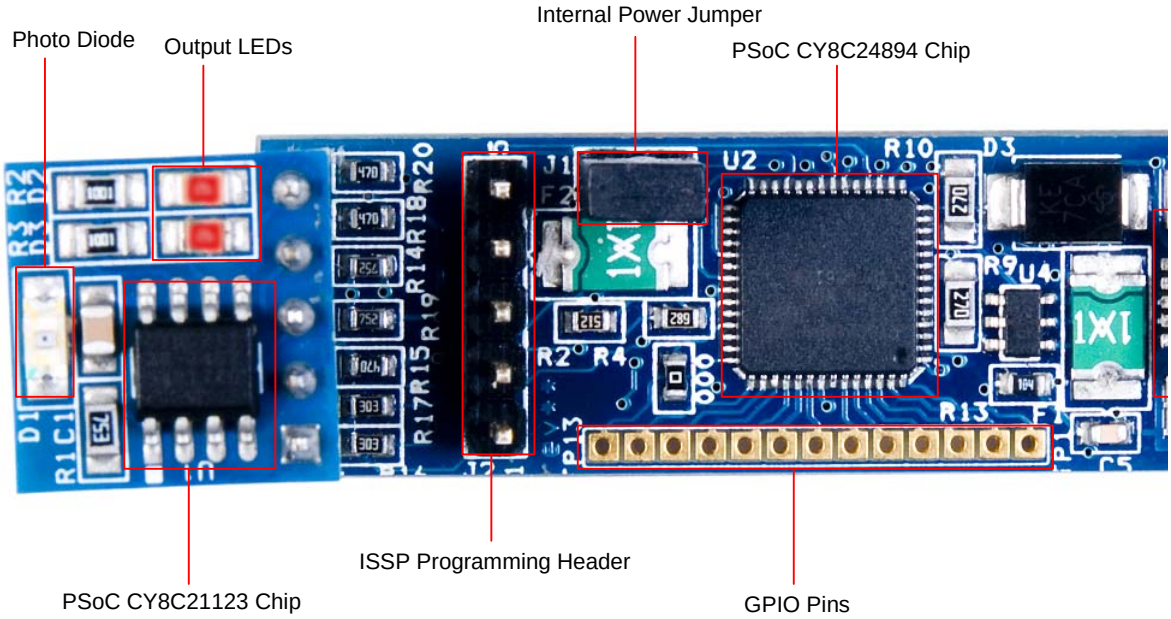
Figure 4-2. Demo Target Board



4.2 Functional Description

The I2C-USB Bridge is connected to the PC in the same way as an HID device. It requires no additional driver when connected to a PC installed with Windows. This I2C-USB Bridge works as a master in the I^2C bus and is controlled by the PC program via USB. In addition, a demonstration PC program is included with the project to demonstrate bridge operation with connected I2C slave.

Figure 4-3. I2C-USB Bridge with Demo Target Board



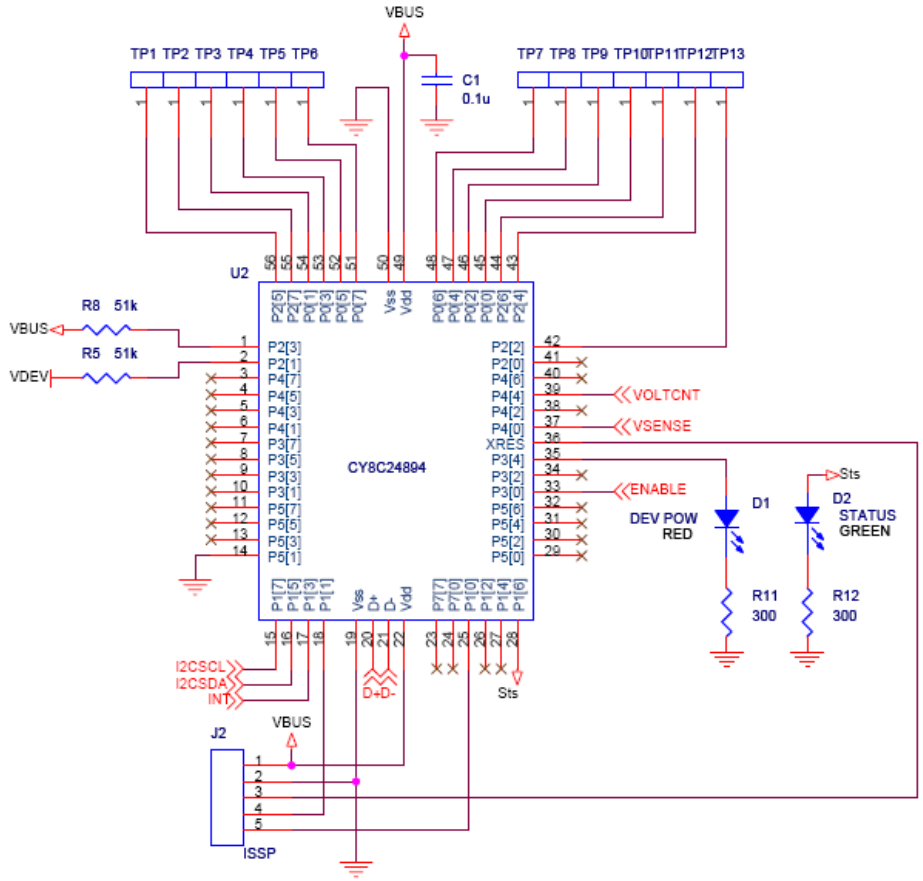
4.2.1 PSoC CY8C24849 Chipset

The PSoC CY8C24894 on CY3240-I2USB Bridge board is pre-programmed to function as full featured, full speed (12 Mbps) USB. This device enables creating customized peripheral (I/O) configurations that match the requirements of each individual application.

The PSoC device also performs the following functions:

- Lights up LED (green) on connecting the bridge to host via USB.
- Lights up LED (red) on external power supply to target device.
- Acts as interface between the host and target device.

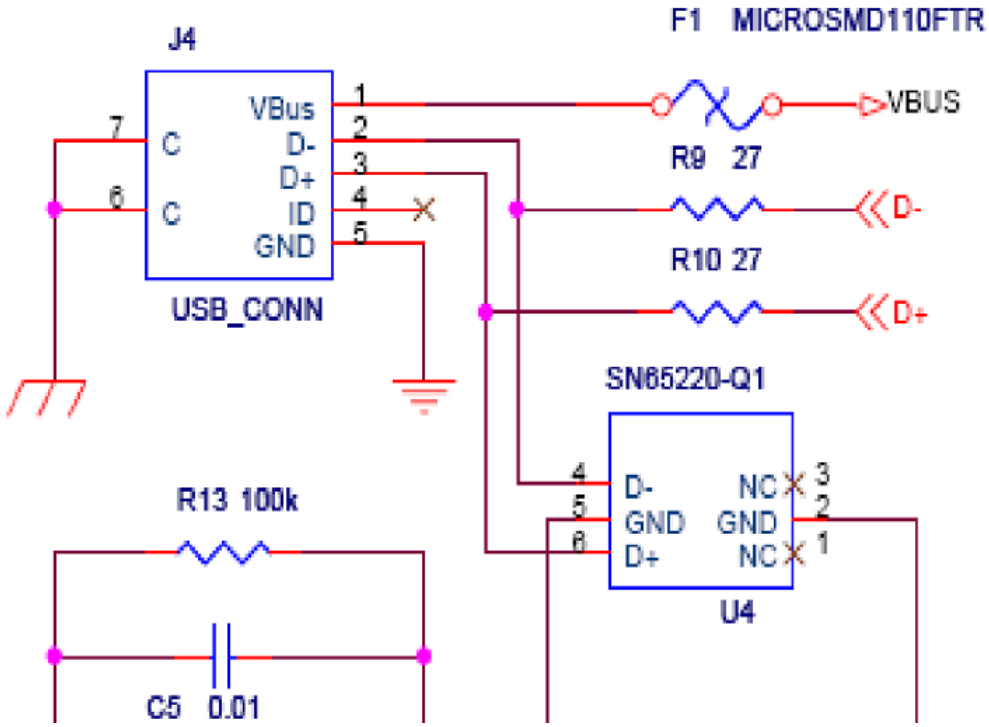
Figure 4-4. PSoC CY8C24894 Hardware Schematic



4.2.2 USB Mini B Connector

USB Mini B connector communicates between the PC and bridge. It is used to power up the bridge and supply voltage range of 3.3 V or 5 V to target board. These plugs are always oriented downstream towards the USB device. It has SN65220, a single transient voltage suppressor, to provide electrical noise transient protection to USB port.

Figure 4-5. USB Mini Port Schematic



4.2.3 ISSP Programming Header

The in-system serial programming header is used to:

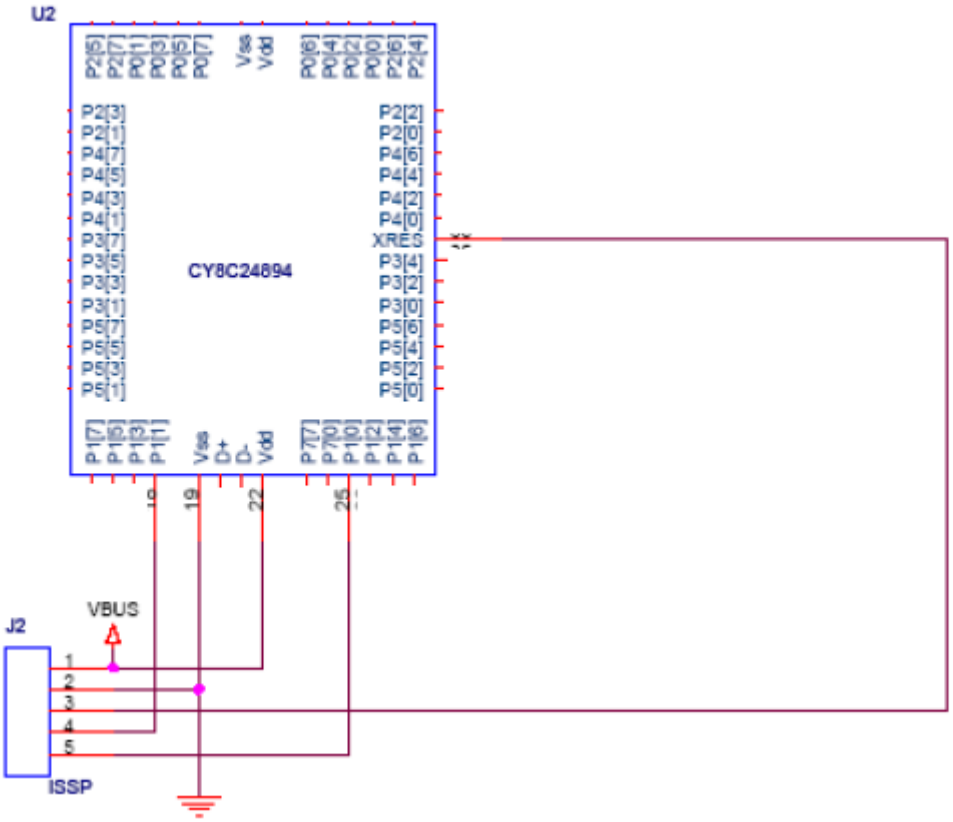
- burn the hex code onto the chip
- connect the MiniProg for programming the chip

The ISSP connector consists of the following:

Table 4-1. ISSP Programming Header Connection Details

Pin No	Connection	Description
1	+V Device	To supply voltage to the bridge
2	GND	Ground pin of the bridge
3	INT	Interrupt pin
4	SDA	Serial data line
5	SCL	Serial clock line

Figure 4-6. ISSP Programming Header Schematic



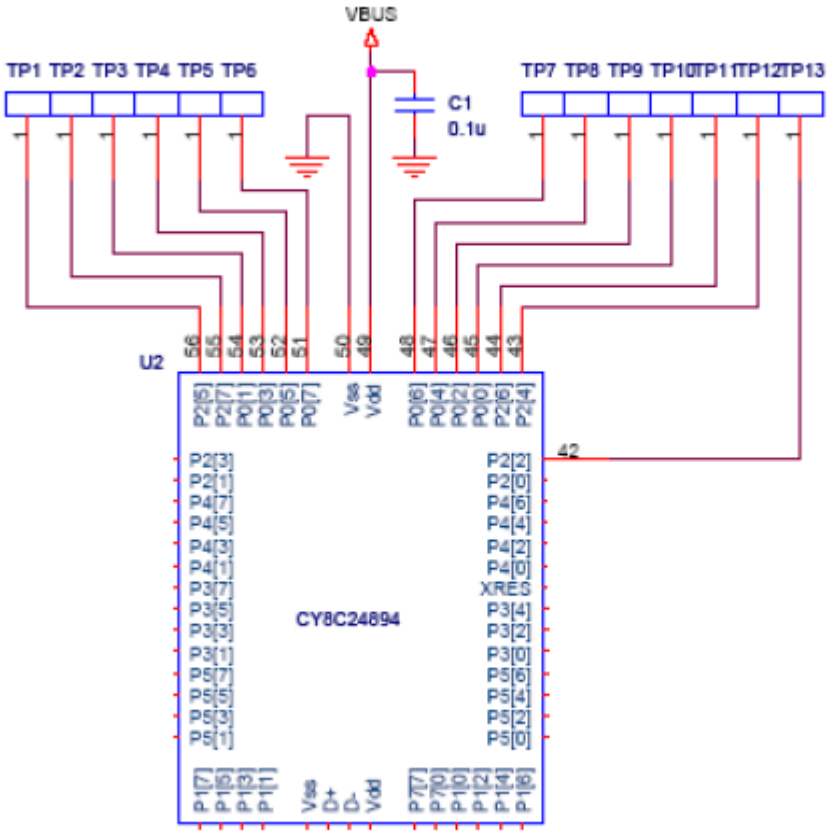
4.2.4 GPIO Pins

GPIO plays an important role in customizing the applications.

Table 4-2. GPIO Pin Connectivity table

Terminal Connection	Port	PIN No.	Description
TP12	P2[4]	43	External Analog Ground (AGND) input
TP11	P2[6]	44	External Voltage Reference (VREF) input
TP10	P0[0]	45	Analog column mux input
TP9	P0[2]	46	Analog column mux input
TP8	P0[4]	47	Analog column mux input
TP7	P0[6]	48	Analog column mux input
TP6	P0[7]	51	Analog column mux input
TP5	P0[5]	52	Analog column mux input and column output
TP4	P0[3]	53	Analog column mux input and column output
TP3	P0[1]	54	Analog column mux input
TP2	P2[7]	55	GPIO
TP1	P2[5]	56	GPIO
TP13	P2[2]	42	GPIO

Figure 4-7. GPIO Pin Schematic



4.2.5 I2C Slave Interface Connector

The I2C slave interface connector is used to communicate data between the target device and bridge board. It consists of two devices, MAX3378 and SN721.

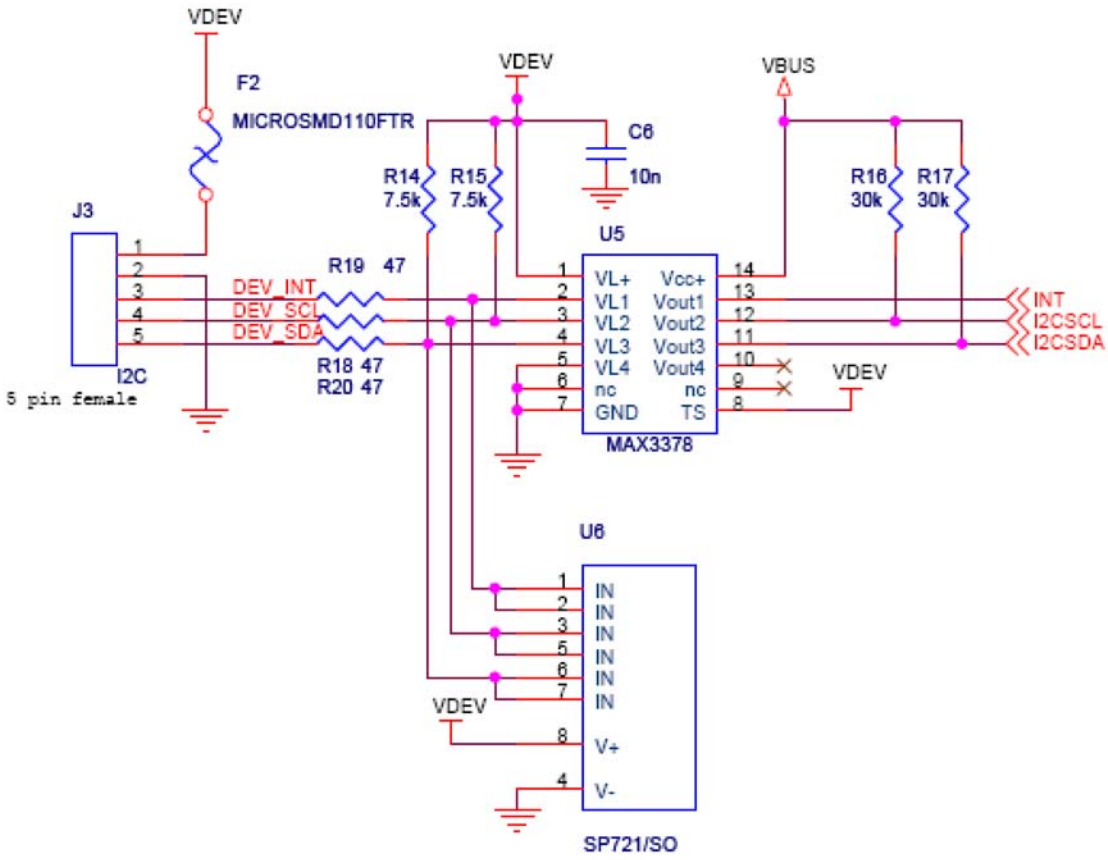
MAX3378

- Is used to convert the voltage level between the target device (Vcc) and host level voltage (V_L)
- Has bidirectional level translation, accepts V_L +1.2 V (Min) to +5.5 V (Max); V_{out}(High) is 0.6 times V_L (if source current is 0.02 mA) and V_{out}(Low) is 0.4 V

SN721

- An array of SCR/diode bipolar structure for ESD and over-voltage protection

Figure 4-8. I2C Slave Interface Schematic



4.2.6 Demo Target Board

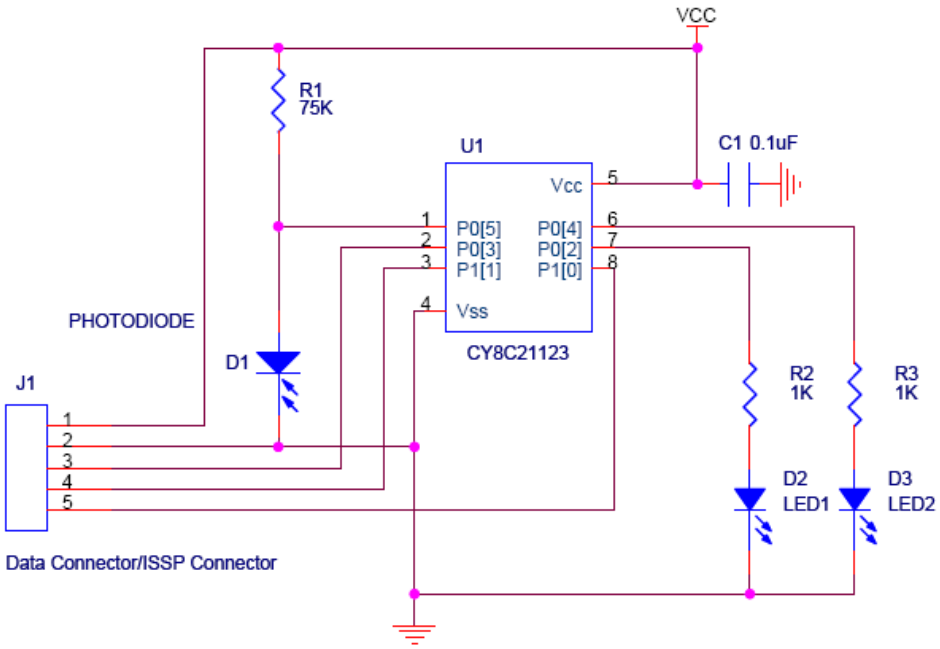
The target board is used to light up the two LEDs on receiving data from host and transfer the data, acquired from photo diode to host.

PSoC device (CY8C21123) is used to control the two LEDs based on input from the host using Bridge Control Panel. The PSoC device updates the I2C register with the sensor information, which can be read by any I2C master.

Table 4-3. CY8C21123 Pin Connectivity

Pin No.	Port No	Description
6	P0[4]	LED1
7	P0[2]	LED2
1	P0[5]	Photo-diode
8	P1[0]	Voltage supply
3	P1[1]	Ground
2	P0[3]	Interrupt
5	Vcc	Serial clock
4	GND	Serial data

Figure 4-9. Demo Board Chip Schematic



5. Example Projects

All example projects are available in the CY3240-I2USB kit CD or at the following location:
`<Installed_directory>:\Cypress\CY3240-I2USB\Firmware`

5.1 Example Project 1: I2C-USB Demo Target Board Project

5.1.1 Project Description

This example project demonstrates the data transfer between target board and host. The target board has a photodiode to measure light intensity and temperature values, which are acquired by the PSOC device (CY8C21123) to transmit to host.

This project uses the following modules to display temperature and light intensity values:

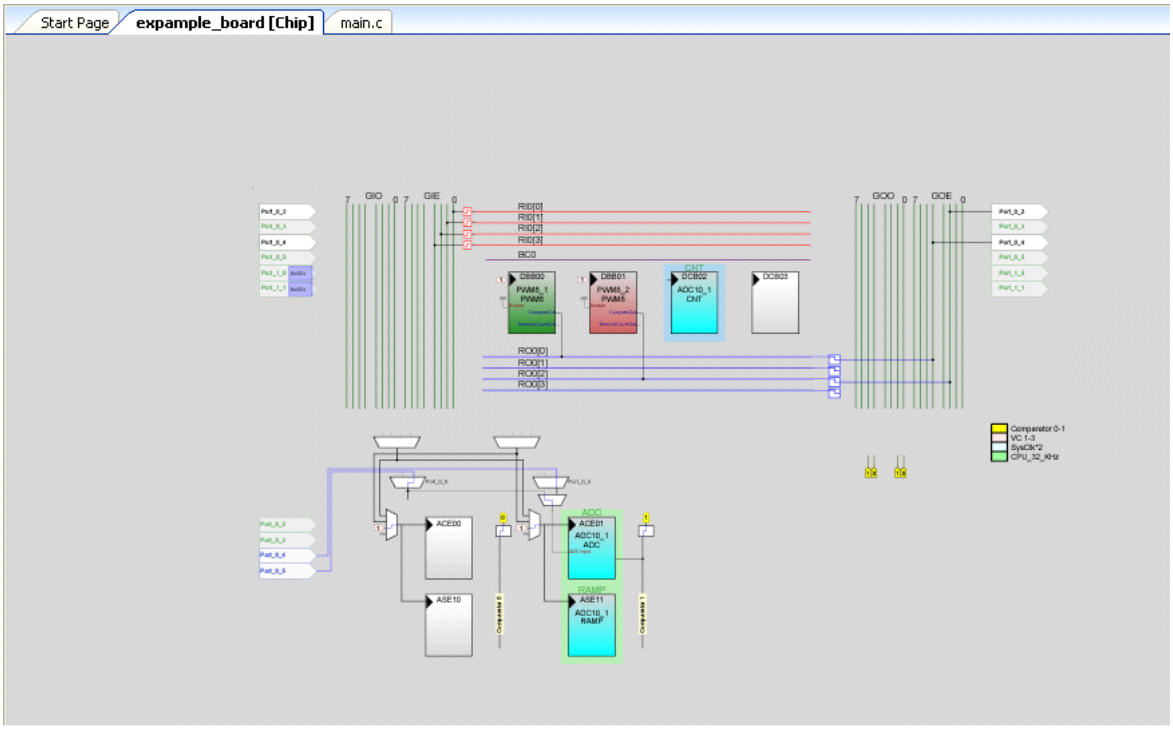
ADC10: Used to obtain the digital values for light intensity and temperature. Input to the ADC module is switched between light input and temperature input once every 551 scan cycles.

EzI2C: Configures the PSoC on target board as I2C slave and is used to transfer data to the bridge board where the PSoC configured as I2C master.

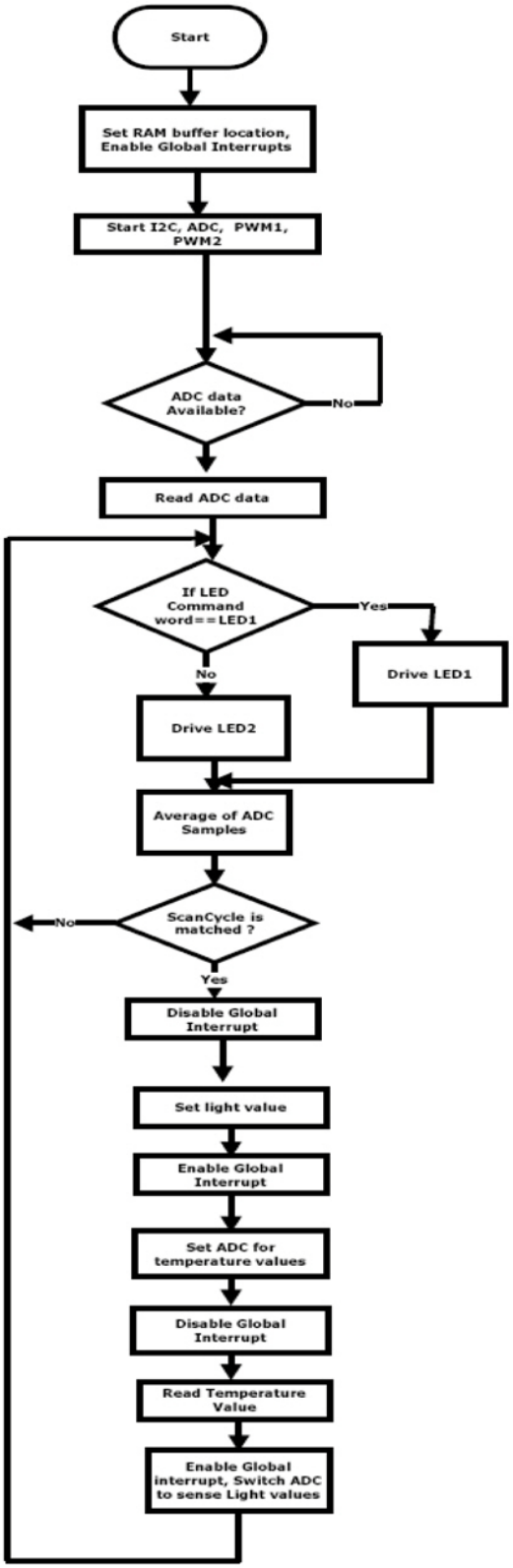
PWM8: Used to handle the LED command from the host and vary the LED intensity accordingly.

5.1.2 Hardware Connections

Figure 5-1. Functional Blocks



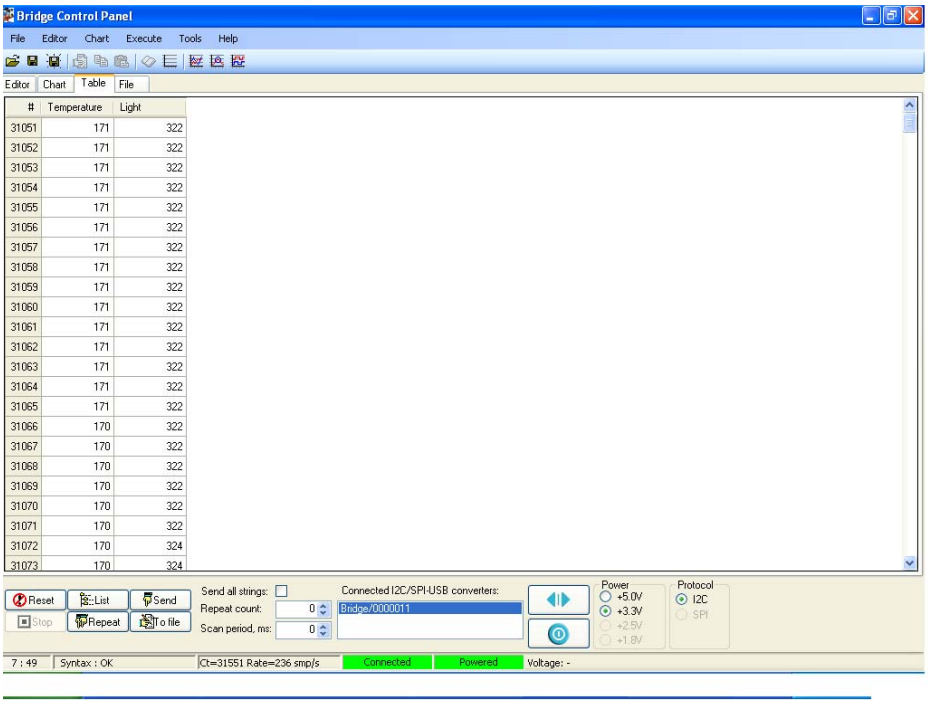
5.1.3 I2C-USB Demo Target Board Flowchart



5.1.4 Verify Output

Load *demo.iic* file from the Bridge Control Panel, as explained in Run Demonstration Board Test on page 17. The light intensity and temperature transmitted by target board to host is shown on the Bridge Control Panel screen, as shown in Figure 5-2.

Figure 5-2. Light Intensity and Temperature Values on Bridge Control Panel



5.2 Example Project 2: I2C-USB Bridge Board Project

5.2.1 Project Description

This project demonstrates communication between the bridge and host. After each packet is received by the bridge, an acknowledgement is sent to the host before the next transfer operation begins.

This project uses the following modules:

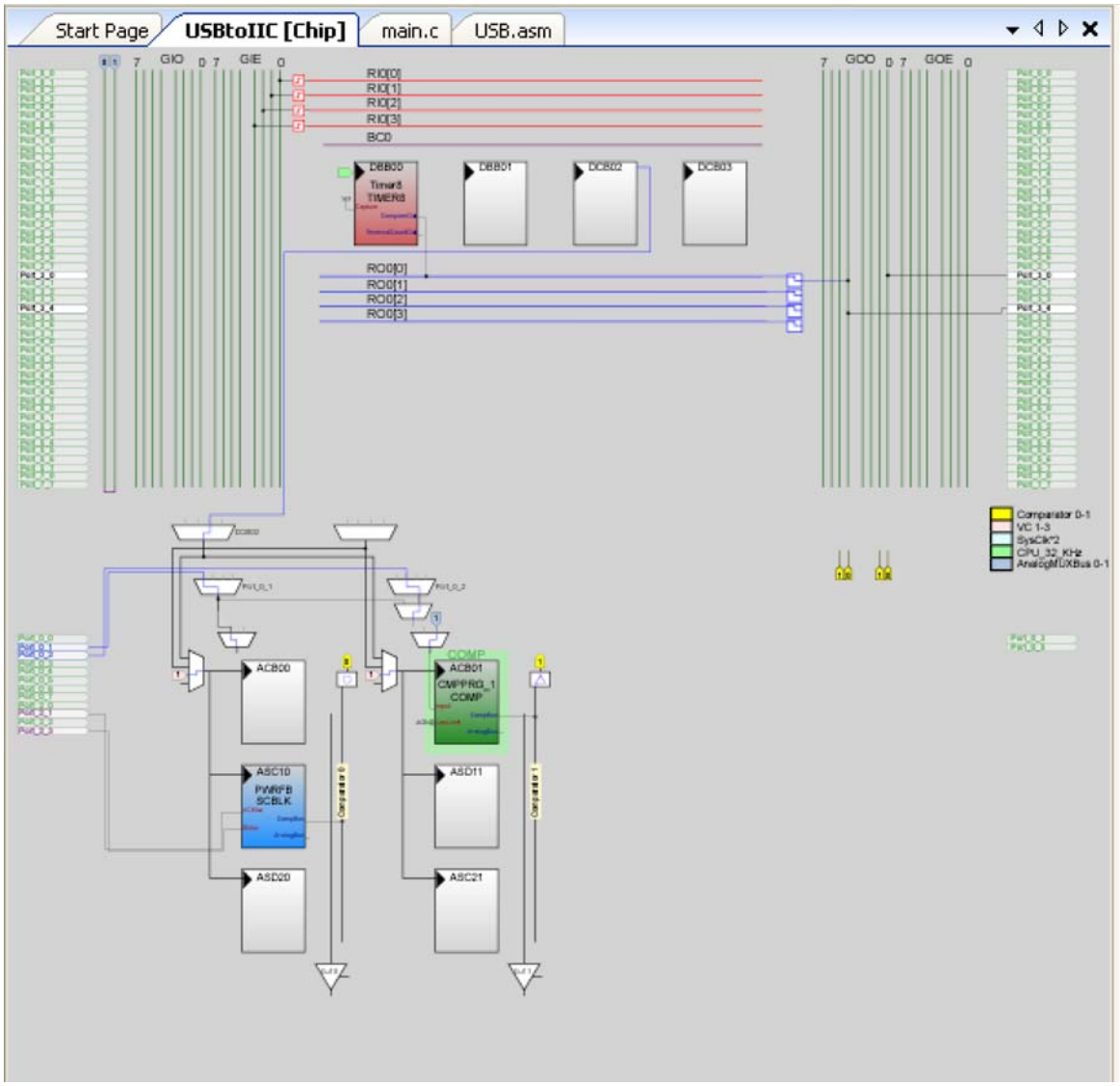
CMPRG: Used to compare the data programmable reference threshold.

PWRFB: Used to set the power level for this application.

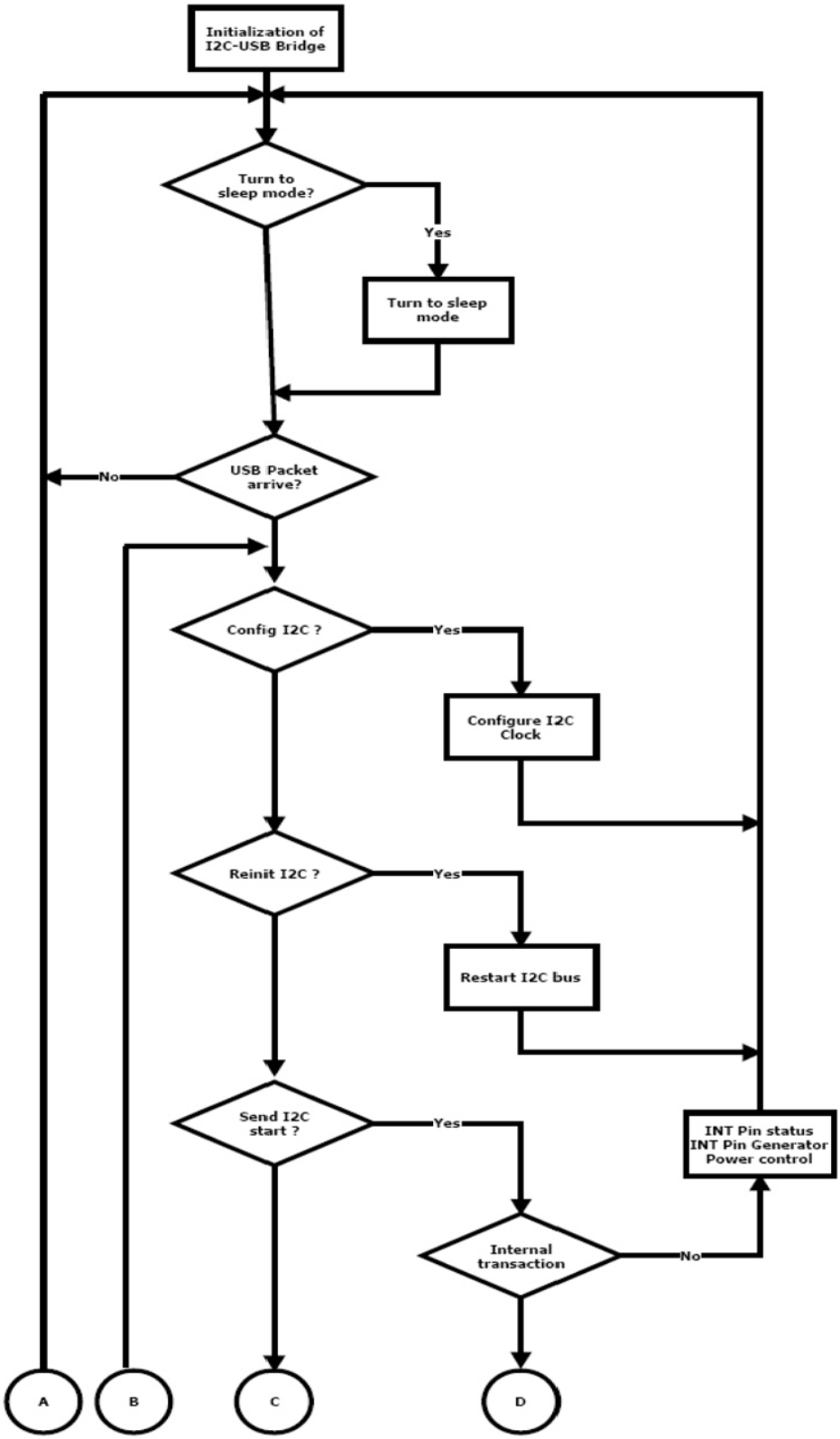
TIMER8: Used to wake up the application from sleep mode.

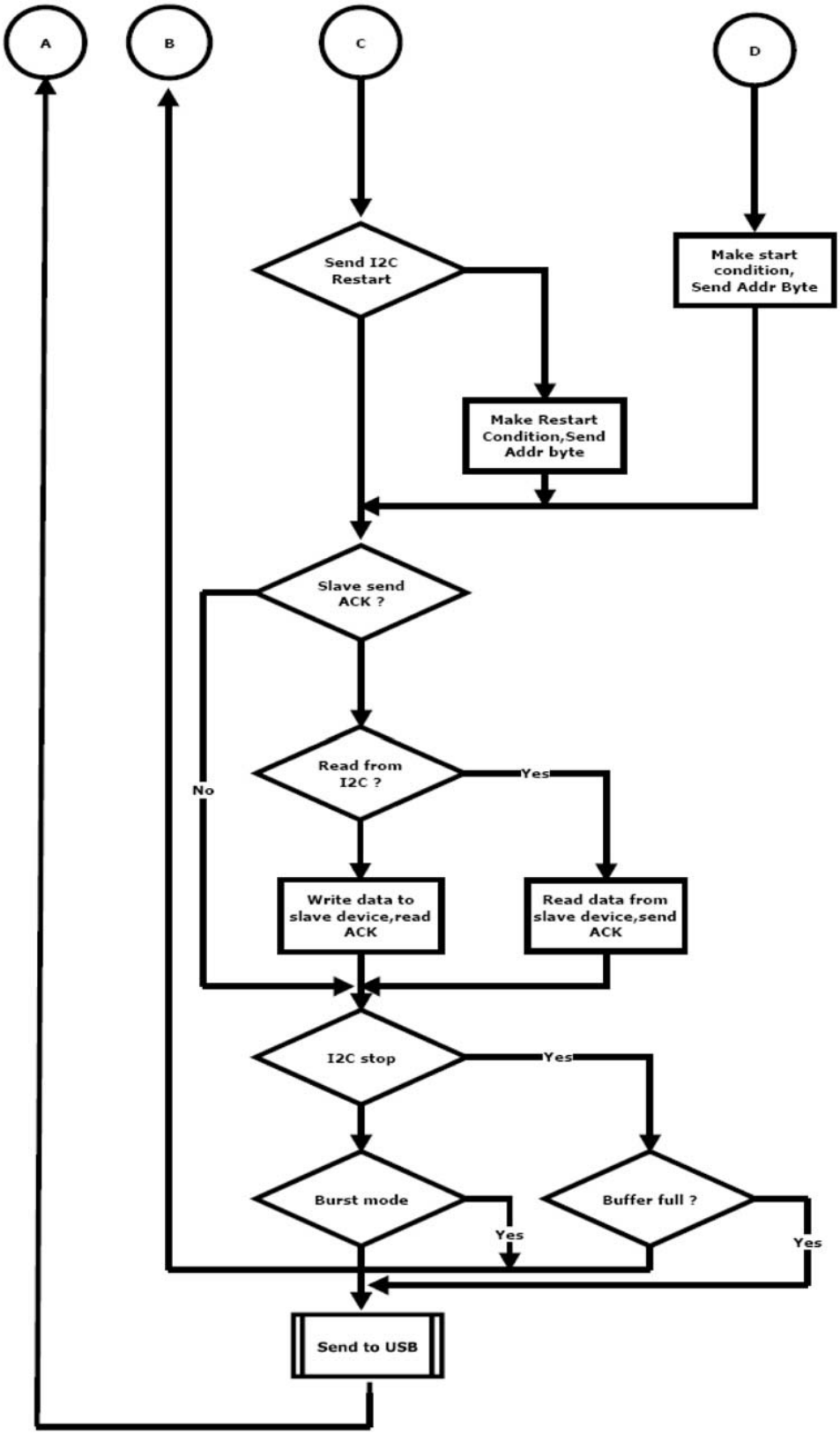
5.2.2 Hardware Connections

Figure 5-3. Functional Bocks



5.2.3 I2C-USB Bridge Flowchart

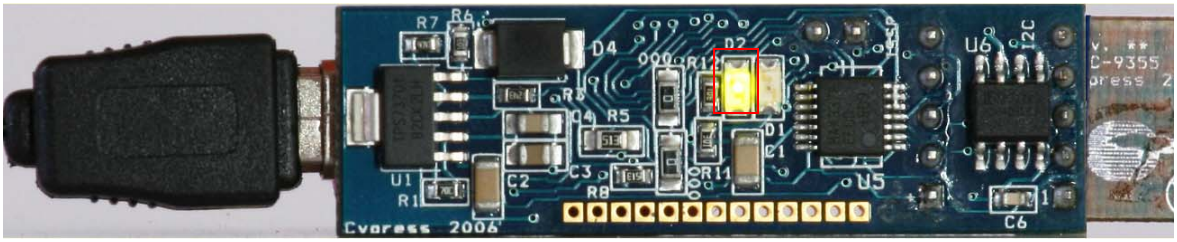



A
B
C
D
Send I2C Restart
Make start condition, Send Addr Byte
Make Restart Condition,Send Addr byte
Slave send ACK ?
No
Read from I2C ?
Yes
Write data to slave device,read ACK
Read data from slave device,send ACK
I2C stop
Yes
Burst mode
Yes
Buffer full ?
Yes
Send to USB

5.2.4 Verify Output

When connected to the demonstration board, LED (green) blinks on the bridge indicating transfer operation between the bridge and PC.

Figure 5-4. Verify Output



A. Appendix

A.1 Schematic

A.1.1 I2C-USB Bridge Schematic

Figure A-1. Reverse Current Protection Schematic

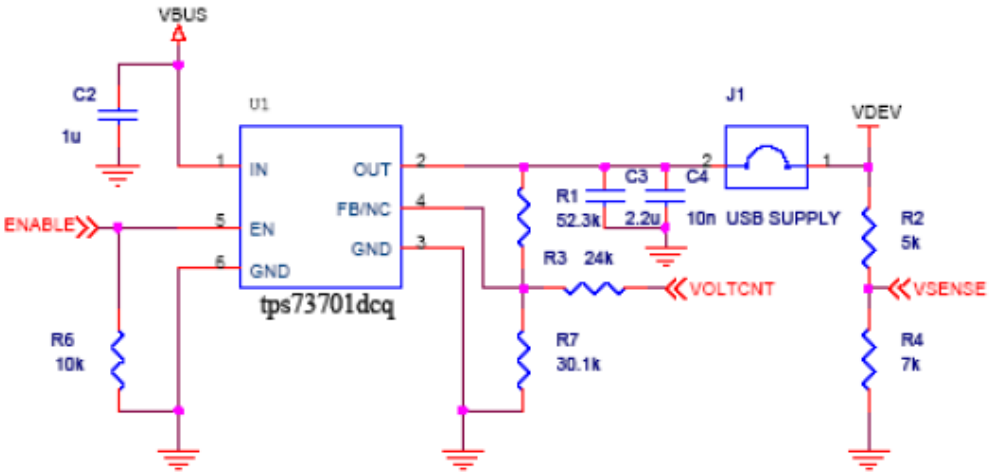


Figure A-2. USB Connection with Voltage Suppressor Schematic

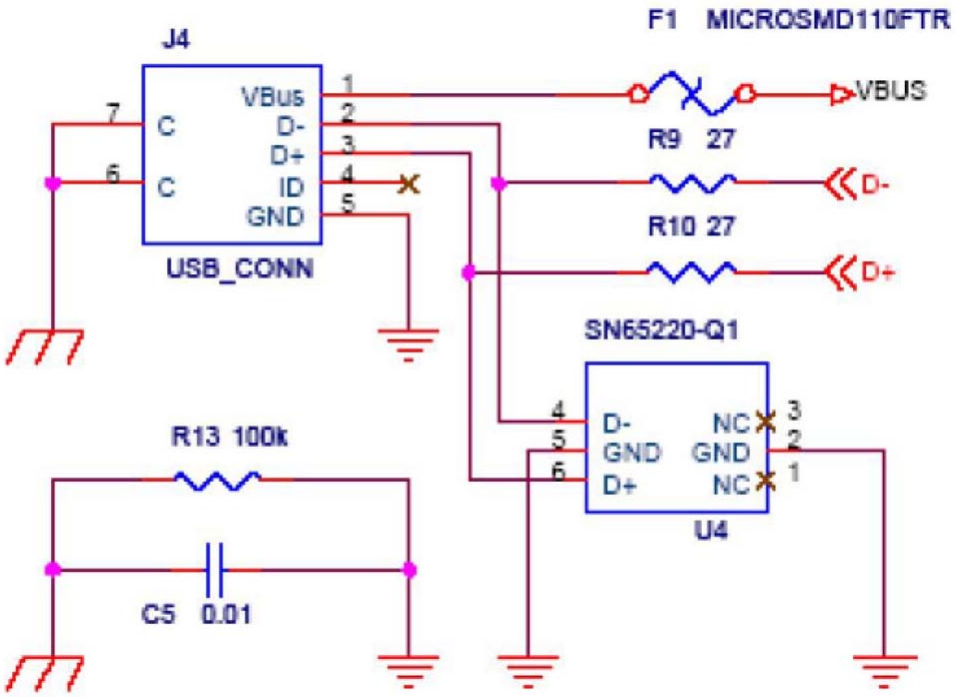


Figure A-3. Diode Schematic

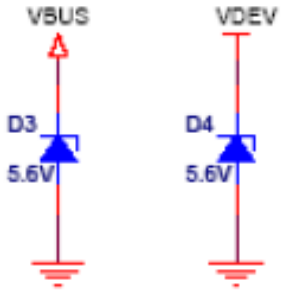


Figure A-4. Voltage Regulator Schematic

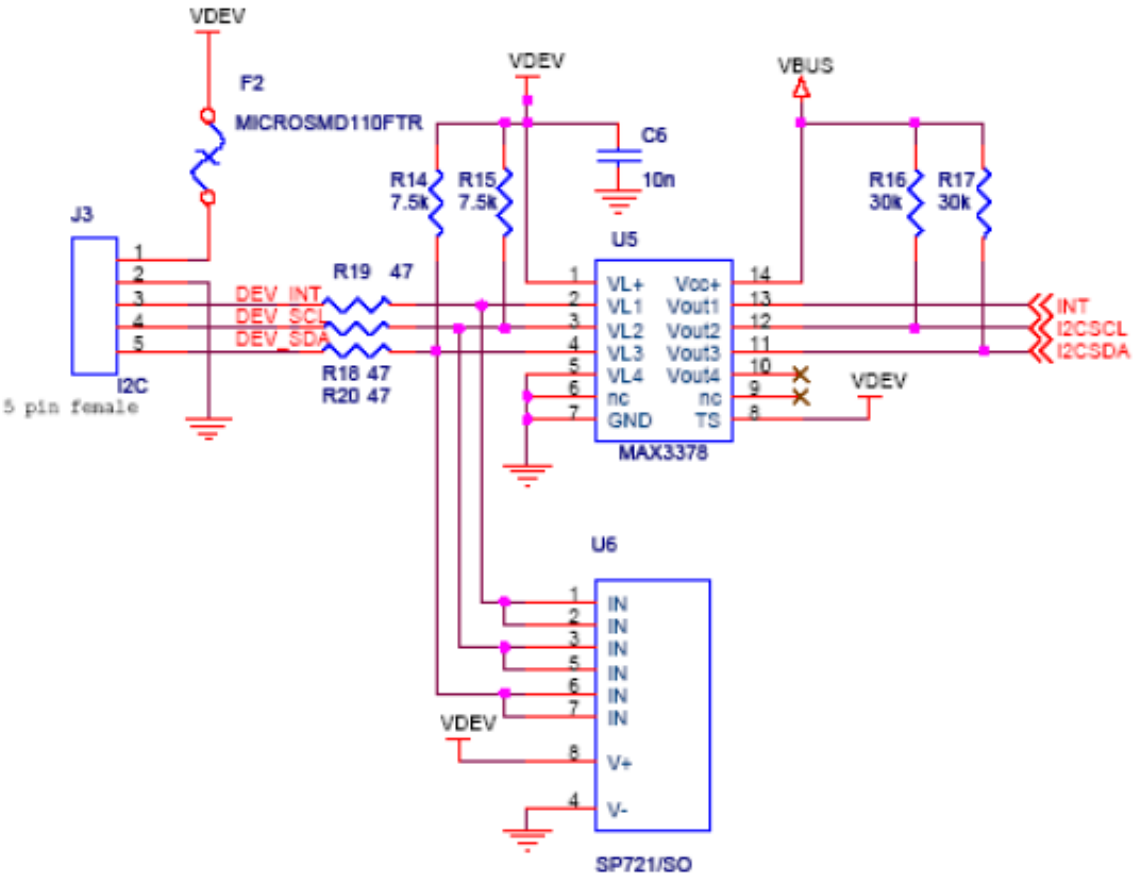
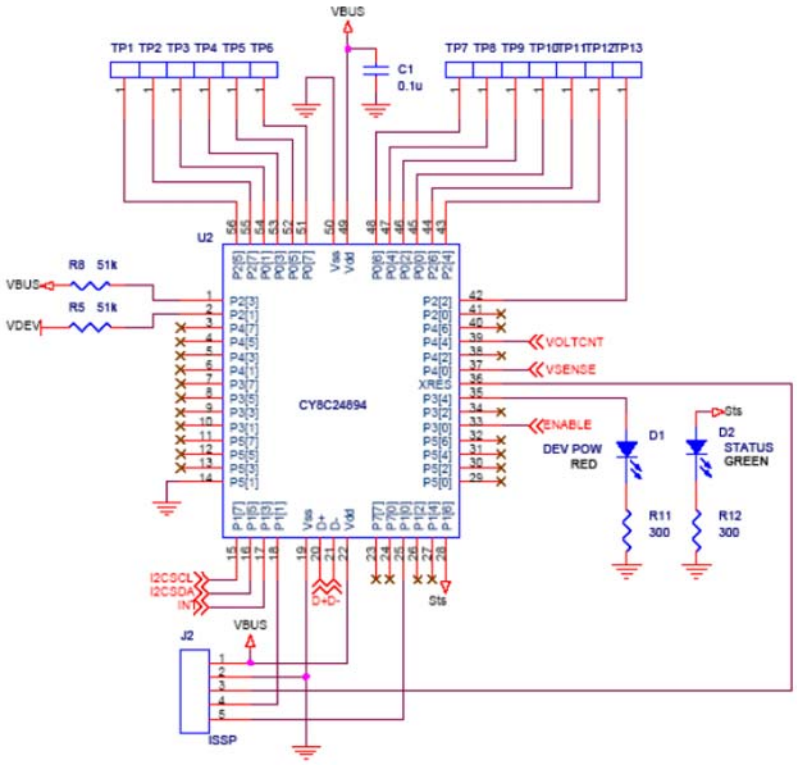
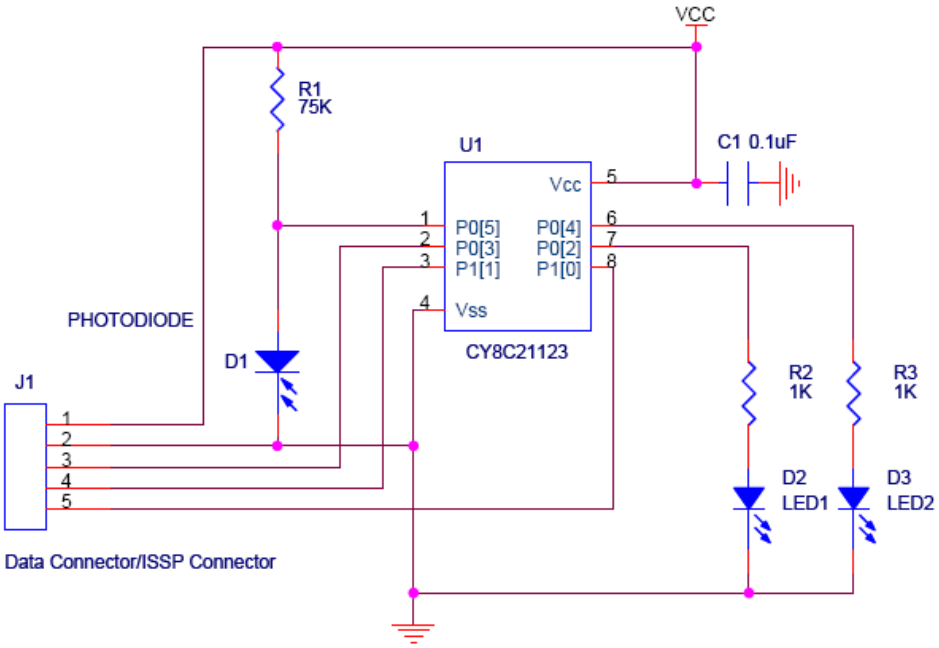


Figure A-5. PSoC CY8C24894 Schematic



A.1.2 Demo Target Board Schematic

Figure A-6. Demo Board Schematic



A.2 I2C-USB Bridge Board Layout

Figure A-7. Top View

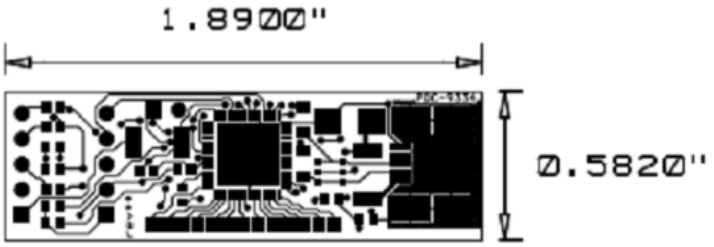
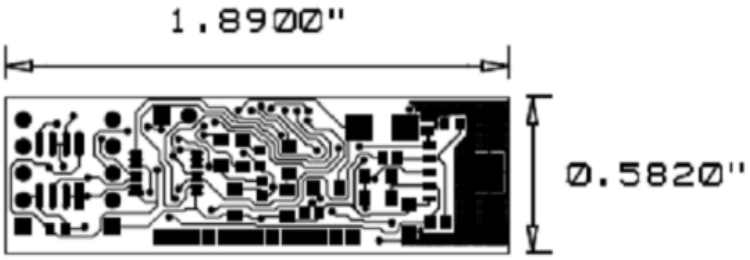
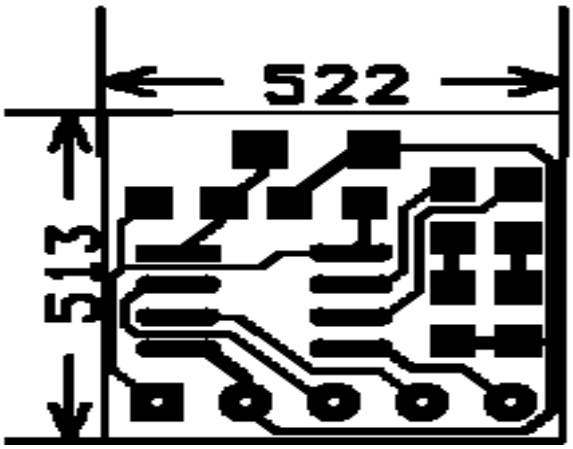


Figure A-8. Bottom View



A.2.1 Demo Target Board Layout

Figure A-9. Top View



A.3 BOM

A.3.1 I2C-USB Bridge BOM Rev. E

Item	Qty	Reference	Description	Manufacturer	Mfr Part Number
			PCB	Cypress Semiconductor	PDC-9334
1	1	C1	CAP CER .10UF 25V X7R 10% 0805	TDK	C2012X7R1E104K
2	1	C2	CAP CER 1.0UF 10V 10% X7R 0805	Murata Electronics North America	GRM21BR71A105KA01L
3	1	C3	CAP CER 2.2UF 16V Y5V 1206	Murata	GRM31MF51C225ZA01L
4	1	C4	CAP CER 10000PF 50V 10% X7R 1206	Murata	GRM319R71H103KA01D
5	2	C5, C6	CAP CERAMIC .01UF 100V X7R 0603	Kemet	C0603C103K1RACTU
6	1	R1	RES 52.3K OHM 1/10W 1% 0603 SMD	Yageo	RC0603FR-0752K3L
7	1	R2	RES 5.1K OHM 1/10W 5% 0603 SMD	Yageo	RC0603JR-075K1L
8	1	R3	RES 24.0K OHM 1/10W 1% 0603 SMD	Yageo	RC0603FR-0724KL
9	1	R4	RES 6.8K OHM 1/10W 5% 0603 SMD	Yageo	RC0603JR-076K8L
10	1	R5	RES 51K OHM 1/8W 5% 0805 SMD	Yageo	RC0805JR-0751KL
11	1	R6	RES 10K OHM 1/10W 5% 0603 SMD	Yageo	RC0603JR-0710KL
12	1	R7	RES 30.1K OHM 1/10W 1% 0603 SMD	Yageo	RC0603FR-0730K1L
13	1	R8	RES 51K OHM 1/10W 5% 0603 SMD	Yageo	RC0603JR-0751KL
14	2	R9, R10	RES 22 OHM 1/8W 5% 0805 SMD	Panasonic - ECG	ERJ-6GEYJ220V
15	2	R11, R12	RES 300 OHM 1/10W 5% 0603 SMD	Yageo	RC0603JR-07300RL
16	1	R13	RES 100K OHM 1/10W 5% 0603 SMD	Rohm	MCR03EZPJ104
17	2	R14, R15	RES 7.5K OHM 1/10W 5% 0603 SMD	Yageo	RC0603JR-077K5L
18	2	R16, R17	RES 30K OHM 1/10W 5% 0603 SMD	Yageo	RC0603JR-0730KL
19	3	R18, R19, R20	RES 47 OHM 1/10W 5% 0603 SMD	Yageo	RC0603JR-0747RL
20	1	J1	CONN HEADER VERT 2POS .100 TIN	Molex/Waldom Electronics Corp	22-28-4020
21	1	J2	CONN HEADER VERT 5POS .100 TIN	Molex/Waldom Electronics Corp	22-28-4050
22	1	J3	CONN HEADER .100 SNGL STR 5POS	3M Electronics	929850-01-05-10
23	1	J4	CONN USB RCPT MINI-B 5POS RT ANG	Delphi Connection Systems	15430262-110
24	2	F1, F2	POLYSWITCH 1.10A RESET FUSE SMD	Tyco Electronics/Raychem Circuit Protection	MINISMDC110-2
25	1	D1 *	LED 660NM RED WTR CLR 1206 SMD	Lumex Opto/Components Inc	SML-LX1206SRC-TR
26	1	D2 *	LED 565NM WTR CLR GREEN 1206 SMD	Lumex Opto/Components Inc	SML-LX1206GC-TR
27	2	D3, D4	Supressor 5V SMB package	Littelfuse Inc	SMBJ5.0CA
28	1	U1	IC LDO REG 1A SOT223-6 TPS73701	Texas Instruments	TPS73701DCQ
29	1	U2	CY8C24894	Cypress Semiconductor	CY8C24894-24LFXI
30	1	U4 *	IC Single USB Port TVS SOT-23-6	Texas Instruments	SN65220DBVT
31	1	U5	IC LVL XLTR LV 8MBPS 14-TSSOP	Maxim	MAX3378EEUD+
32	1	U6	TVS Array ESD 6 Input 8-SOIC	Littelfuse Inc	SP721ABG
33	2	* 000	RES 0.0 OHM 1/8W 5% 0805 SMD	Rohm	MCR10EZHJ000
34	1	* 000	RES 0.0 OHM 1/8W 5% 0603 SMD	Rohm	MCR03EZPJ000
35	1	J1 *	Shunt	3M	929950-00

A.3.2 Demo-Target Board R

Item	Qty	Reference	Description	Manufacturer	Mfr Part Number	Digi-Key Part Number
			PCB	Cypress Semiconductor	PDC-9355	
1	1	C1	CAP 100nF 25V CERAMIC X7R 0805	Panasonic - ECG	ECJ-2VB1E104K	PCC1828CT-ND
2	1	R1	RES 75K OHM 1/8W 5% 0805 SMD	Yageo America	RC0805JR-0775KL	311-75KARCT-ND
3	2	R2, R3	RES 1.0K OHM 1/8W 5% 0805 SMD	Yageo America	RC0805JR-071KL	311-1.0KARCT-ND
4	1	D1	Visible Light Sensor	Microsemi Inc	LX1972IBC	
5	2	D2, D3	LED RED CLEAR 0805 SMD	LITE-ON INC	LTST-C170CKT	160-1176-2-ND
6	1	U1	IC PSoC 21x23 8SOIC	Cypress Semiconductor	CY8C21123-24SXI	
7	1	J1	CONN HEADER .100 SNGL STR 5POS	Samtec	TSW-105-07-T-S	SAM1035-05-ND