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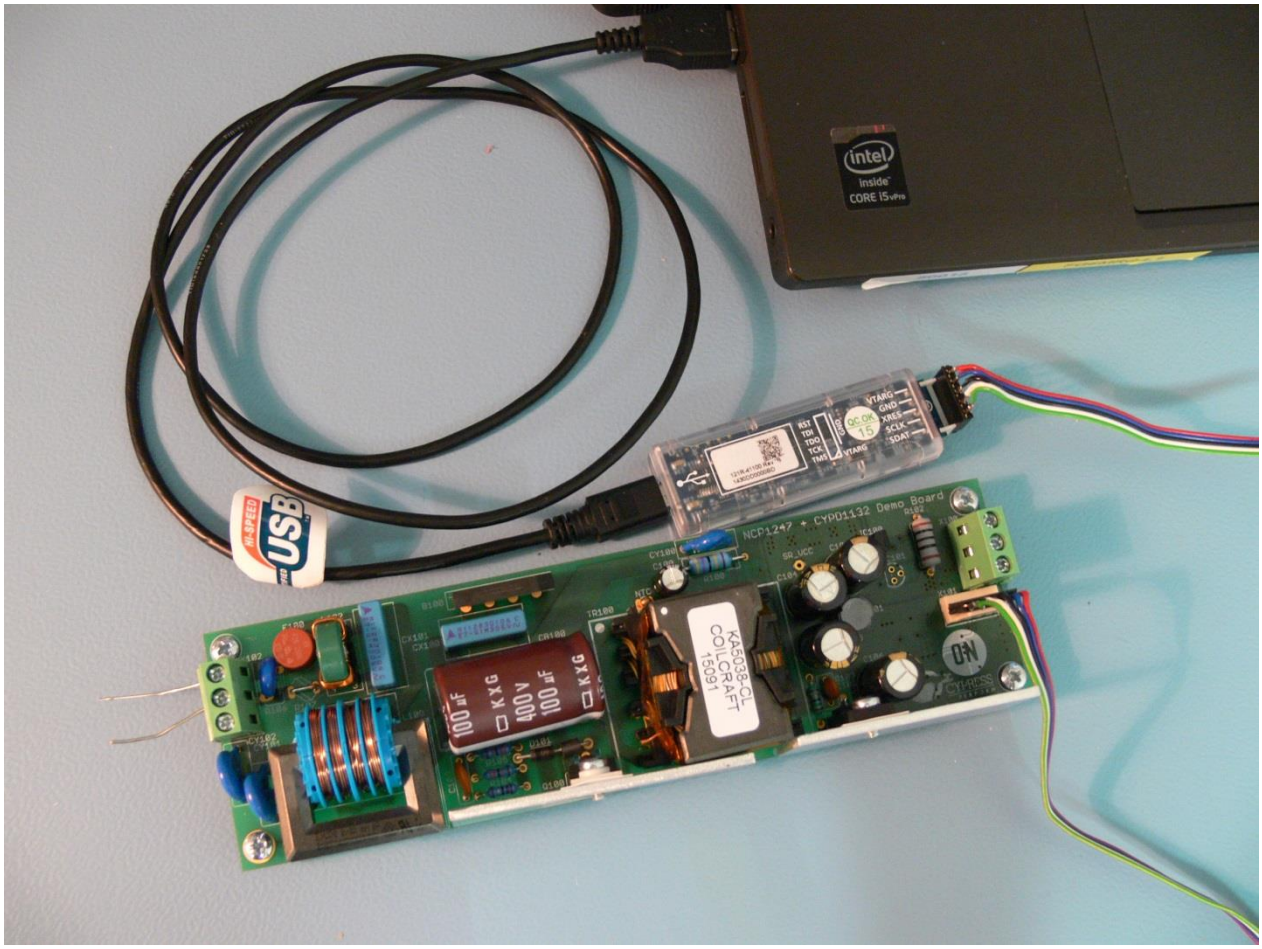
ON Semiconductor®

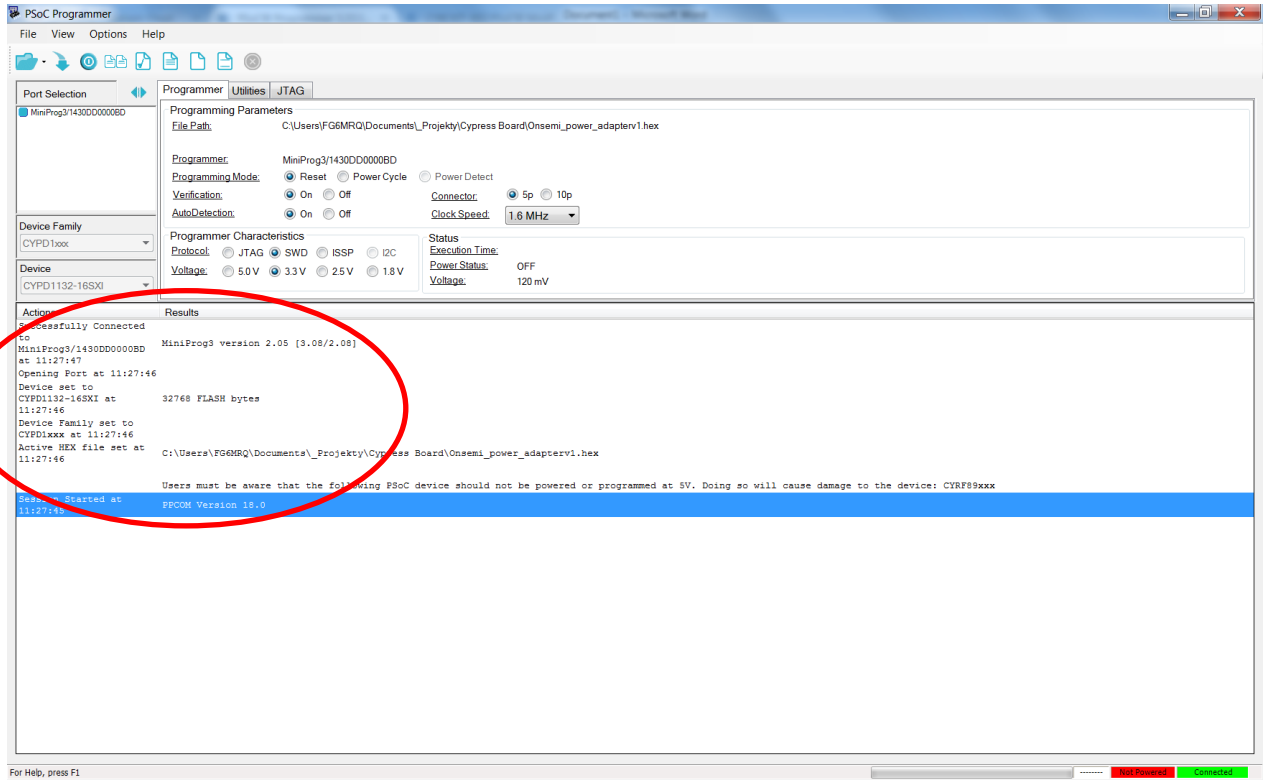
Test Procedure for the NCP1247USBPDGEVB Evaluation Board

How to program the cypress MCU

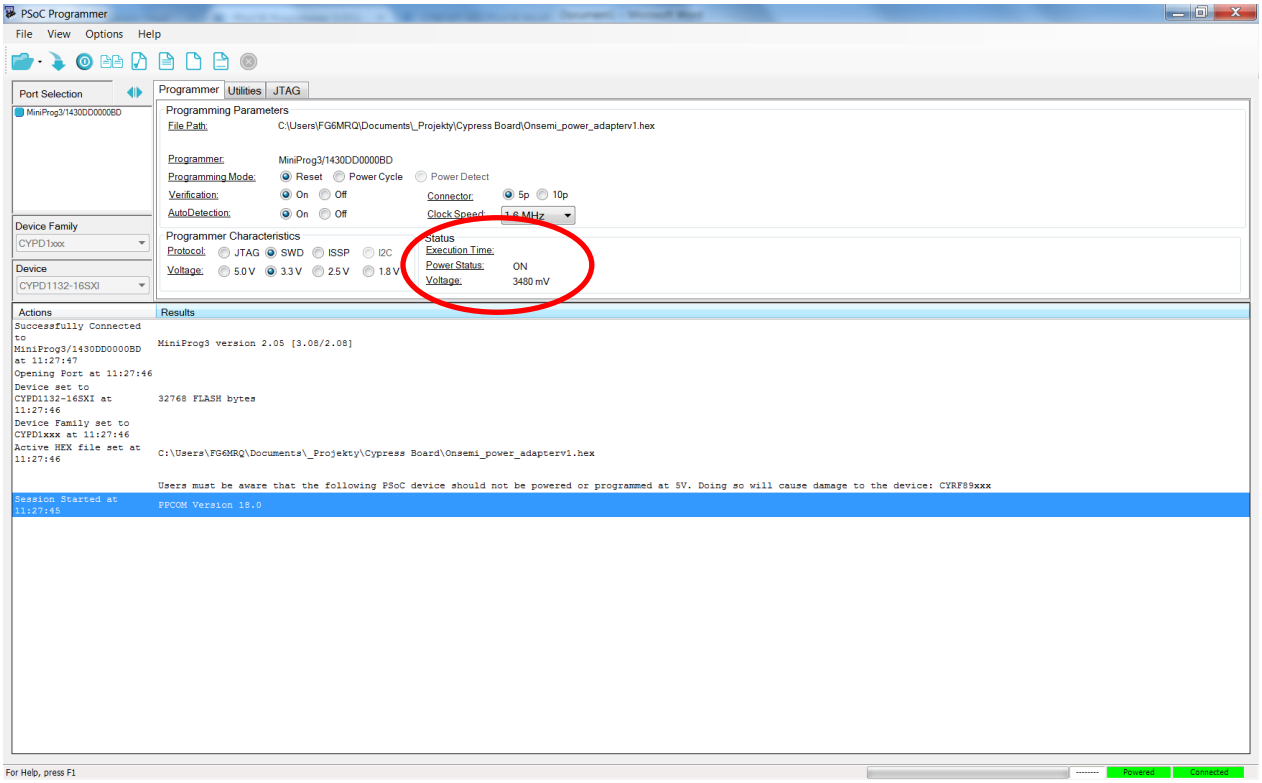
1. You need MiniProg3
   http://www.cypress.com/documentation/development-kitsboards/cy8ckit-002-psoc-miniprog3-program-and-debug-kit
2. Install the PSoC Programmer included on CD or you can download the latest version on web:
   http://www.cypress.com/documentation/software-and-drivers/psoc-programmer-3231
3. Connect your PC with the MiniProg3 and with the Poweboard



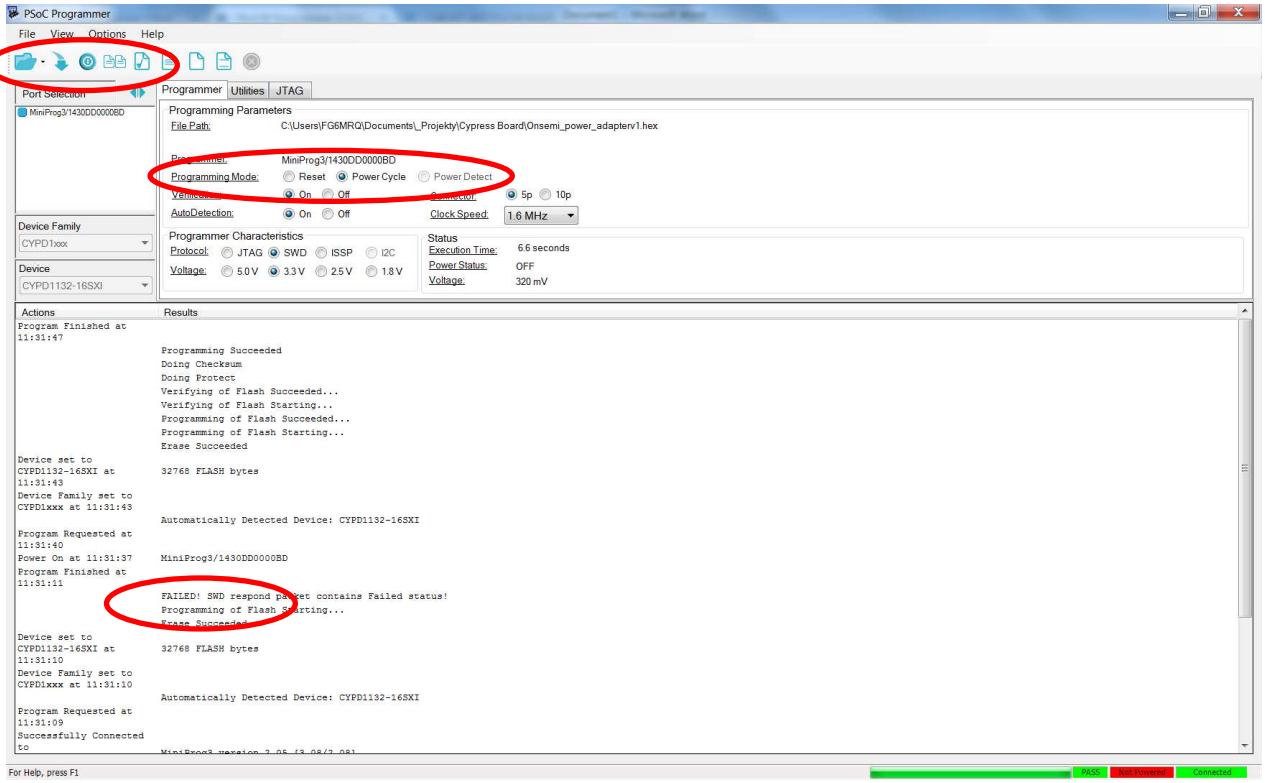
4. Launch the PSoC Programmer
5. If everything is all right, you can see message “Successfully connected to MiniProg3 version” and “Device se to CYPD1132-16SXI”:



6. Load file “Onsemi_power_adapterv1.hex”
7. Supply the powerboard from mains and you see the change on “power status” and “voltage”. Use terminal X102-1 for L, terminal X102-2 for N and terminal X102-3 for PE. If you have two wires cable as it usual, the terminal PE should be unconnected.



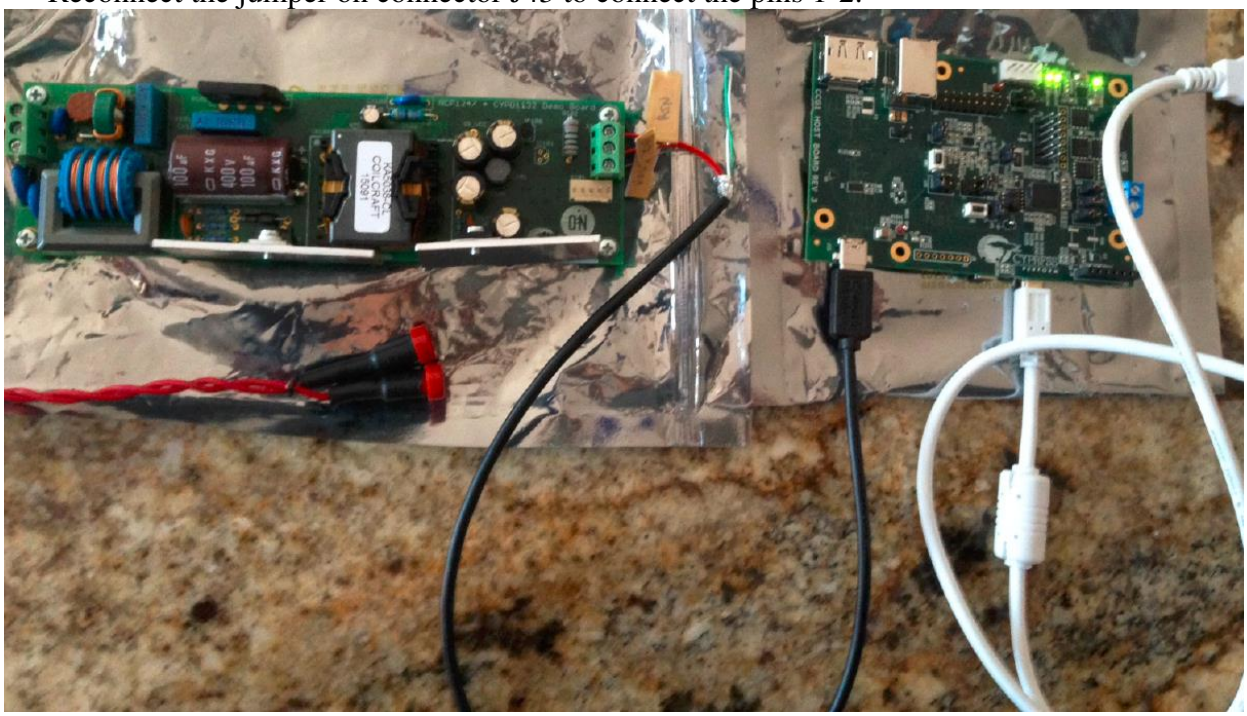
8. Click on Program button.
   If you see the message FAILED!, just toggle the programming mode to “power cycle”, click on “toggle power” button and “program” button.



9. If you see the message Programming succeeded, the program was loaded.

How to control the output of poweboard USB-PD

1. I strongly recommend supply the CCG1 Host Board rev3 from the stable power source and not from the PC by USB Mini cable.
   The connector J28 is for power supply, pin1 - +5V, pin2 – GND.
   Reconnect the jumper on connector J43 to connect the pins 1-2.



2. Prepare the USB Type-C cable. Cut the connector from one side and use the red wire for VBUS (X100-2), black wire for RTN (X100-1) and brown for CC(X100-3). Verify that you use the right wires! The schematic of CCG1 Host board rev3 is attached as a file AC-DC_w_Cypress_Host.pdf.
3. Connect these wires to X100 terminal on poweboard.
4. Now, you supply the CCG1 Host Board rev3, supply the powerboard from mains.
5. Connect the USB Type-C connector to the CCG1 Host Board. On the output of powerboard is 5V now.
6. When you press the SW2 button on CCG1 Host Board rev3, you can change the output voltage on the power board among the voltage levels 5V, 12V, 20V. There is no debounce filter on the SW2 button, so sometimes you can change the voltage from 5V to 20V. It's not a fault of powerbobard.
7. Do not supply the power board with connected CCG1 Hostboard rev3. It could lead to higher consumption of Cypress MCU. When you end the work with power supply, disconnect the USB-TypeC connector.

09/23/2015

Required Equipment:

Current limited 90 ÷ 265 Vrms AC source (current limited to avoid board destruction in case of defective part) (e.g. KEYSIGHT 6813B) ……..…. 1pc
AC Volt-Meter able to measure up to 300 V AC (e.g. KEITHLEY 2000) ……. 1pc
AC Amp-Meter able to measure up to 3 A AC (e.g. KEITHLEY 2000) ……... 1pc
DC Amp-Meter able to measure up to 3 A DC (e.g. KEITHLEY 2000)……. 1pc
DC Volt-Meter able to measure up to 30 V DC (e.g. KEITHLEY 2000) ……. 1pc
DC Electronic Load (e.g. AGILENT 6060B) …….. 1pc
DC source (e.g. STATRON 2223.1) ……..……..... 1pc

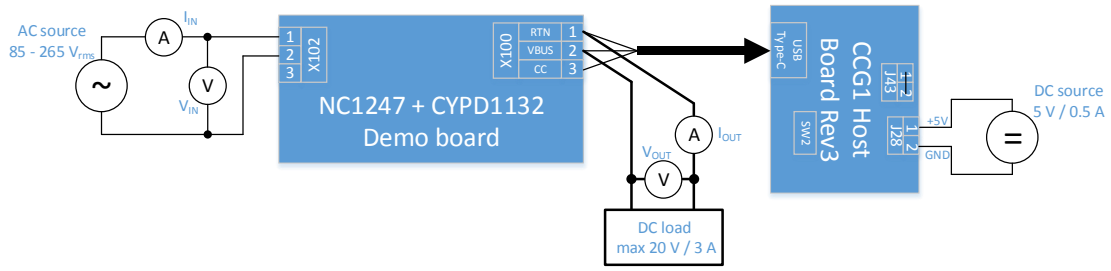


Figure 1: Test Setup

The following steps describe the test procedure for all these boards:

Test Procedure:

1. Connect the test setup as shown in Figure 1. Don't connect the CCG1 Host Board Rev3 with USB Type-C cable.
2. Apply an input voltage to NCP1247 + CYPD1132 demoboard, V_{IN} = 90 ÷ 265 Vac
3. Apply an input voltage to CCG1 host board Rev3, V_{IN} = 5 Vdc
4. Set load current to I_{OUT} = 0 A
5. Check that V_{OUT} = 0 Vdc
6. Connect the USB Type-C cable to the CCG1 Host Board Rev3
7. Check that V_{OUT} = 5 Vdc
8. Set I_{OUT} = 3 A
9. Press the SW2 button
10. Check that V_{OUT} = 12 Vdc
11. Press the SW2 button
12. Check that V_{OUT} = 20 Vdc
13. Press the SW2 button
14. Check that V_{OUT} = 5 Vdc
15. Turn off the load
16. Disconnect the USB Type-C cable to the CCG1 Host Board Rev3
17. Turn off AC source
18. Turn off DC source

19. End of the test

Test of OCP protection:

1. Connect the test setup as shown in Figure 1. Don't connect the CCG1 Host Board Rev3 with USB Type-C cable.
2. Apply an input voltage to NCP1247 + CYPD1132 demoboard, V_{IN} = 90 ÷ 265 Vac
3. Apply an input voltage to CCG1 host board Rev3, V_{IN} = 5 Vdc
4. Set load current to I_{OUT} = 0 A
5. Connect the USB Type-C cable to the CCG1 Host Board Rev3
6. Set the output voltage to V_{OUT} = 20 Vdc by SW2 button
7. Set I_{OUT} = 3 A
8. Set I_{OUT} = 4 A and check output voltage. V_{OUT} should be 0 Vdc.
9. Check the output voltage after few seconds. It should be 5 Vdc.
10. Turn off the load
11. Disconnect the USB Type-C cable to the CCG1 Host Board Rev3
12. Turn off AC source
13. Turn off DC source
14. End of the test

Be careful when manipulating the boards in operation, lethal voltages up to 425V are present on the primary side. An isolation transformer is also recommended for safer manipulations.