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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-psocminiprog3-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":



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PSoC Programmer	A Section of the sect	
File View Options He	lp	
Port Selection	Programmer Utilities JTAG	
MiniProg3/1430DD0000BD	Programming Parameters	
	File Path: C:\Users\FG6MRQ\Documents_Projekty\Cypress Board\Onsemi_power_adapterv1.hex	
	Programmer. MiniProg3/14300D0000BD	
	Programming Mode: Prover Cycle Power Detect Prover Detect	
Device Family	AutoLetector: On Ott Clock Speed: 1.6 MHz	
CYPD1xxx ·	Programmer Characteristics Status	
Device	LINDEGI JAAG 💿 SWD 🔅 ISSP 🛛 IZC LAACUUGII IIIIII: Power Status: OFF	
CVDD1122-166VI	Voltage: 0.50V @ 33V 0.25V 0.18V Voltage: 120mV	
off off of 100Al		
Action	Results	
Connected		
to MiniProg3/1430DD0000BD	MiniProg3 version 2.05 [3.08/2.08]	
at 11:27:47		
Opening Fort at 11:27:4 Device set to		
CYPD1132-16SXI at	32768 FLASH bytes	
Device Family set to		
CYPD1xxx at 11:27:46		
Active HEX file Set at 11:27:46	C:\Users\FG6MRQ\Documents_Projekty\Cypess Board\Onsemi_power_adapterv1.hex	
Seas a Started at	Users must be aware that the following FSoC device should not be powered or programmed at SV. Doing so will cause damage to the device: CYRF89xxx	
11:27:45	PPCOM Version 18.0	
Help, press F1		 Not Powered Conn

- 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.





PSoC Programmer	and the Annual Annua	_ 🗆 🗙
File View Options He	lp log	
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Port Selection	Programmer Utilities JTAG	
MiniProg3/1430DD0000BD	Programming Parameters <u>File Patr.</u> C:(Users)FG6MRQ\Documents_Projekty(Cypress Board(Onsemi_power_adapterv1 hex	
	Everyammer, willings i southouse and a set of power Cycle Power Detect	
	Verification:	
	AutoDetection. O 0n Off Clock Speed 16 MHz	
Device Family	Programmer Characteristics Status	
CTED IXXX *	Protocol: JTAG SWD ISP IC Execution Time:	
Device	<u>Voltage:</u> 5.0 V @ 3.3 V @ 2.5 V @ 1.8 V <u>Voltage</u> ; 340 mV	
Actions Successfully Connected	Results	
to MiniProg3/1430DD0000BD	MiniProg3 version 2.05 [3.08/2.08]	
at 11:27:47		
Opening Fort at 11:27:46 Device set to		
CYPD1132-16SXI at 11:27:46	32768 FLASH bytes	
Device Family set to		
Active HEX file set at	C:\Users\FGMBG\Documents\ Projektv\Curress Board\Onsemi power adaptery; bey	
11:27:46		
Constant Constant an	Users must be aware that the following PSoC device should not be powered or programmed at SV. Doing so will cause damage to the device: CYRF89xxx	
11:27:45	PPCOM Version 18.0	
For Help, press Et		d Connected

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.



PSoC Programmer	and the second	
File View Options H	elp	
Port Selection	Programmer Utilities JTAG	
MiniProg3/1430DD00008D	Programming Parameters	
	File Path C:\Users\FG6MRQ\Documents_Projekty\Cypress Board\Onsemi_power_adapterv1.hex	
	Bossimmer, MiniProg3/1430DD0000BD	
	Programming Mode; 💿 Reset 💿 Power Cycle 💿 Power Detect	
	Vermos. Of Second Secon	
	AutoDetection.	
Device Family	Programmer Characteristics Status	
CYPD1xxx *	Protocol: JTAG © SWD © ISSP 12C Execution Time: 66 seconds	
Device	Voltage: 50V 0 13V 25V 18V PowerStatus: OFF	
CYPD1132-16SXI -	Vollage: 320 mV	
h atawa		
Actions Program Finished at	Results	
11:31:47		
	Programming Succeeded	
	Doing Checksum	
	Doing Protect	
	Verifying of Flash Succeeded	
	Programming of Flash Succeeded	
	Programming of Flash Starting	
	Erase Succeeded	
Device set to CYPD1132-16SXI at	32768 FLASH bytes	
Device Family set to		
CYPD1xxx at 11:31:43		
Program Requested at	Automatically betected bevice: CYUDI32-165X1	
11:31:40		
Power On at 11:31:37	MiniFreg3/1430DD000BD	
Program Finished at 11:31:11		
	FAILED! SWD respond paret contains Failed status!	
	Programming of Flash Serving	
Device set to	Frage Successor	
CYPD1132-16SXI at	32768 FLASH bytes	
11:31:10 Device Family con		
CYPD1xxx at 11:31:10		
	Automatically Detected Device: CYPD1132-16SXI	
Program Requested at		
Successfully Connected		

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.



- 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.

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Required Equipment:

Current limited 90 ÷ 265 Vrms AC source (current limited to avoid board des	truction 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



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, $V_{IN} = 90 \div 265$ 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

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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, $V_{IN} = 90 \div 265$ 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.