

Automotive PSOC[™] 4700S Plus: CY8CKIT-4700S-PLUS Evaluation Kit user guide

About this document

Scope and purpose

The CY8CKIT-4700S-PLUS is an inductive sense V2 kit for the PSOC[™] 4700S Plus microcontrollers, a scalable and reconfigurable platform architecture for a family of programmable embedded system controllers with an Arm[®] Cortex[®]-M0+ CPU while being AEC-Q100 compliant. It combines programmable and reconfigurable analog and digital blocks with flexible automatic routing.

Intended audience

This document is intended for design engineers for evaluation of automotive inductive sense applications with CY8CKIT-4700S Plus.



Important notice

Important notice

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Safety precautions

Safety precautions

Note: Please note the following warnings regarding the hazards associated with development systems.

Table 1	Safety precautions
	Warning: The evaluation or reference board contains DC bus capacitors which take time to discharge after removal of the main supply. Before working on the drive system, wait for five minutes for the capacitors to discharge to safe voltage levels. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication that capacitors have discharged to safe voltage levels.
	Warning: The evaluation or reference board is connected to the grid input during testing. Therefore, high-voltage differential probes must be used when measuring voltage waveforms by oscilloscope. Failure to do so may result in personal injury or death. Darkened display LEDs are not an indication that capacitors have discharged to safe voltage levels.
	Warning: Remove or disconnect power from the drive before you disconnect or reconnect wires or perform maintenance work. Wait for five minutes after removing power to discharge the bus capacitors. Do not attempt to service the drive until the bus capacitors have discharged to zero. Failure to do so may result in personal injury or death.
<u></u>	Caution: The heat sink and device surfaces of the evaluation or reference board may become hot during testing. Therefore, necessary precautions are required while handling the board. Failure to comply may cause injury.
	Caution: The evaluation or reference board contains parts and assemblies sensitive to electrostatic discharge (ESD). Electrostatic control precautions are required when installing, testing, servicing, or repairing the assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with electrostatic control procedures, refer to the applicable ESD protection handbooks and guidelines.
	Caution: A drive that is incorrectly applied or installed can lead to component damage or reduction in product lifetime. Wiring or application errors such as undersizing the motor, supplying an incorrect or inadequate AC supply, or excessive ambient temperatures may result in system malfunction.
	Caution: The evaluation or reference board is shipped with packing materials that need to be removed prior to installation. Failure to remove all packing materials that are unnecessary for system installation may result in overheating or abnormal operating conditions.





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CY8CKIT-4700S-PLUS kit contents

1 CY8CKIT-4700S-PLUS kit contents

The kit includes one main board, and a metal target.



Figure 1 CY8CKIT-4700S-PLUS kit contents

1.1 Overview

The CY8CKIT-4700S-PLUS board contains the 40-QFN package of Automotive PSOC[™] 4700S Plus microcontrollers (MCU), onboard debugger (KitProg), three inductive sense buttons, one metal proximity inductive sensor, seven sensor LEDs, one user LED, user buttons, and shield connectors (Arduino, mikroBUS, XENSIV[™] S2G). Figure 2 shows the kit features and blocks.



Figure 2 CY8CKIT-4700S-PLUS board - top view



CY8CKIT-4700S-PLUS kit contents

1.2 Block diagram



Figure 3 CY8CKIT-4700S-PLUS kit board – block diagram



CY8CKIT-4700S-PLUS kit contents

1.3 Board functions

Table 2 CY8CKIT-4700S-PLUS kit board functions

#	Function	Specification	Remarks	Note
1	PSOC™ 4700S Plus	CY8C4747LQS-S453	U31: 40-QFN	_
2	PSOC [™] 5LP KitProg3	CY8C5868LTI-LP039	U1: 68-QFN	_
3	USB connector	Micro-USB connector	J1	_
4	VBAT connector	Battery connector	J19	
5	Power LED	USB VBUS monitor LED	LED2 (blue)	_
6	Status LED	KitProg3 status LED	LED1 (green)	_
7	Program header	5-pin 4700S PLUS MCU prog/debug	J35	No load
8	Program connector	KitProg PSOC [™] 5LP program connector	J2 (5 pins)	No load
9	LDO	3.3 V LDO: TLE4284DV33ATMA1	U30	_
10	Inductive buttons	Inductive sensors (3)	BTN1, BTN2, BTN3	PCB tracks
11	Proximity coil	Proximity sensor coils	PROXMITY	PCB tracks
12	Sensor LEDs	LEDs for inductive sense buttons (3)	LED8/LED9/LED10	_
13	Sensor LEDs	LEDs for proximity-sensing (4)	LED3/ LED4/ LED5/ LED6	_
14	Test header	Current measurement and monitoring	J27 (2 pins)	No Load
15	Jumper resistors	Serial connect resistors (I2C or UART)	R98/R103 (I2C), R99/R101 (UART)	-
16	Extension header	40-pin (2-row) IFX standard connector	J11/J25	No load
17	Arduino headers	1x6 (1), 1x8 (2) and 1x10 (1) for Arduino compatibility	J29/J28/J30/J31	-
18	mikroBUS header	Two 1x8 mikroBUS headers	J32/J33	-
19	Groove connector	6-pin, 100 mils, SMBus	J26	No load
20	XENSIV [™] S2G bus connector	Infineon's XENSIV™ bus sensor 17- pin interface	S2G1	No load
21	User LED	User LED connected to MCU	LED7 (green)	-
22	User button	User push button connected to MCU	SW3	-
23	Reset button	System reset push button	SW2	-
24	Mode button	Mode push button for KitProg programming	SW1	-



Getting started

2 Getting started

2.1 Power up the lite kit

The CY8CKIT-4700S-PLUS kit can be powered from the USB port.

To power up the lite kit, connect the Micro-USB cable between the evaluation kit and the host system. The same connection (KitProg3) also provides the programming and debugging over the CMSIS-DAP interface.

2.1.1 Power from USB

By default, the evaluation kit is configured to run on 5 V. In case of USB power, the different sections power requirements are as follows:

- MCU power: VBAT from USB (5 V) or 3.3 V from LDO
- mikroBUS power: 5 V from USB (5 V) or 3.3 V from LDO
- XENSIV[™] bus power: 5 V from USB (5 V) or 3.3 V from LDO
- Arduino bus power: 5 V from USB (5 V) or 3.3 V from LDO
- IFX bus power: 5 V from USB (5 V) or 3.3 V from LDO
- Peripheral power: 5 V from VBAT USB or 3.3 V from LDO

Note: 5 V from VBUS or 3.3 V from LDO power could be selected through 0 Ω resistors- Mount R129 for 5 V VBUS or mount R130 for 3.3 V from LDO.



Getting started

2.2 Hands-on shipping firmware

The CY8CKIT-4700S-PLUS kit comes with preinstalled firmware to check all the onboard peripherals.

2.2.1 Hardware and tool setup

To check the preinstalled firmware on the CY8CKIT-4700S-PLUS kit, follow these steps to set up and communicate with the host system:



Figure 4 CY8CKIT-4700S-PLUS Evaluation Kit and tool setup

- 1. Connect the USB cable from the PC to the evaluation kit. The evaluation kit is powered by the PC via the USB cable (5 V). Ensure that the power LED2 (blue LED) is turned ON.
- 2. When powered ON, the PSOC[™] 4700S Plus device starts executing the pre-installed firmware, which can be confirmed by touching the inductive sense buttons and observe the respective LED glows.
- 3. Also, confirm by using the metal target near the proximity sensor and observe the proximity LEDs glowing as the metal target move towards and away from the sensor.
- 4. To communicate with the PC, set up the serial terminal on the PC to send and receive messages to or from the evaluation kit. Follow these configurations in the Termite:
- **Port**: COMx KitProg3 USB-UART (COMx)
- Baud rate: 19200
- Data bits: 8
- Stop bits: 1
- Parity: None
- Flow Control: None



Getting started

🚯 Termite 3.4 (by CompuPhase) — 🗆 🗙				() Termite 3.4 (by CompuPhase) — — X
COM3 19200 bps, 8N1, no handshake Settings Clear About Close	Serial port settings			2 Local RTs DTR Remote CTS DSR RI CD ERR BREAK
Lemme is initialized and ready. Type a sting time defiling (below) and press <enter? (or wait for the remote device to send data).</enter? 	Port configuration Port COM26 Baud rate 19200 Data bits 8	Append nothing Append CR Append LF Append LF Append CR-LF	Options Stay on top Quit on Escape Autocomplete edit line Keep history	Count 1: 43541, Count 2: 40902, Count 3: 43627, Count 4: 37181 Count 1: 43540, Count 2: 40903, Count 3: 43626, Count 4: 37180 Count 1: 43540, Count 2: 40903, Count 3: 43542, Count 4: 37180 Count 1: 43547, Count 2: 40910, Count 3: 43544, Count 4: 37185 Count 1: 43547, Count 2: 40901, Count 3: 43544, Count 4: 37181 Count 1: 43527, Count 2: 40901, Count 3: 43542, Count 4: 37181
	Stop bits 1 Parity none Flow control none	Cocal echo Received text Polling 100 ms Max. lines Font default	Plug-ins Auto Reply Function Keys Hex View	Count 1: 43546, Count 2: 40910, Count 3: 43548, Count 4: 37185 Count 1: 43546, Count 2: 40903, Count 3: 43544, Count 4: 37179 Count 1: 43539, Count 2: 40907, Count 3: 43635, Count 4: 37179 Count 1: 43541, Count 2: 40909, Count 3: 43636, Count 4: 37179 Count 1: 43636, Count 2: 40900, Count 3: 43548, Count 4: 37179 Count 1: 43636, Count 2: 40900, Count 3: 43541, Count 4: 37179 Count 1: 43537, Count 2: 40900, Count 3: 43544, Count 4: 37179
 	Forward none User interface language	English (en)	Cancel OK	Count 1: 43533. Count 2: 40900. Count 3: 43625. Count 4: 37180 Count 1: 43632. Count 2: 40905. Count 3: 43632. Count 4: 37179 Count 1: 43631. Count 2: 40907. Count 3: 43631. Count 4: 37181 Count 1: 43550. Count 2: 40912. Count 3: 43546. Count 4: 37185 Count 1: 43544. Count 2: 40905. Count 3: 43561. Count 4: 37185

Figure 5 Termite setup

2.2.2 Software checks

The evaluation kit comes with the pre-installed firmware when turned ON, it starts executing. After completing the tool setup, follow these steps to check the firmware and lite kit features:

- 1. Reset the PSOC[™] 4700S Plus device using the reset button (SW2).
- 2. Press the user button (SW3) to toggle the user LED7 (green LED).
- 3. Touch on any of the inductive sense buttons (BTN1, BTN2, BTN3) and verify using the onboard LEDs (LED8, LED9 and LED10).
- 4. Take the metal target near and farther from proximity coil to see the onboard LEDS (LED3, LED4, LED5 and LED6) turn o and OFF gradually.
- 5. Also monitor the UART terminal (Termite window) to see the raw counts of all the four sensors. Observe that the row count increases when a touch is detected.

0	Termite 3.4 (by CompuPhase)	- 0	×
(OM	149 19200 bps, 8N1, no handshake Settings	Clear About	Close
2	Local RTS DTR Remote CTS DSR	RI CD ERR	BREAK
PS	SoC 4 MCU UART transmit and receive		^
Cou	ount 1: 43541, Count 2: 40902, Count 3: 43	627, Count 4: 37181	
Cou	ount 1: 43540, Count 2: 40903, Count 3: 43	626, Count 4: 37180	
Cou	ount 1: 43632, Count 2: 40903, Count 3: 43	542, Count 4: 37180	
Cou	ount 1: 43547, Count 2: 40910, Count 3: 43	638, Count 4: 37185	
Col	ount 1: 43543, Count 2: 40905, Count 3: 43	544, Count 4: 37180	
Col	ount 1: 43627, Count 2: 40901, Count 3: 43	542, Count 4: 37181	
Cou	ount 1: 43546, Count 2: 40910, Count 3: 43	548, Count 4: 37185	
Cou	ount 1: 43541, Count 2: 40903, Count 3: 43	544, Count 4: 37179	
Cou	ount 1: 43539, Count 2: 40907, Count 3: 43	635, Count 4: 37179	
Cou	ount 1: 43541, Count 2: 40909, Count 3: 43	635, Count 4: 37182	
Co	ount 1: 43636, Count 2: 40907, Count 3: 43	548, Count 4: 37179	
Co	ount 1: 43627, Count 2: 40900, Count 3: 43	541, Count 4: 37179	
Co	ount 1: 43537, Count 2: 40900, Count 3: 43	542, Count 4: 37177	
Co	ount 1: 43539, Count 2: 40900, Count 3: 43	625, Count 4: 37180	
Co	ount 1: 43632, Count 2: 40905, Count 3: 43	632, Count 4: 37179	
Cou	ount 1: 43631, Count 2: 40907, Count 3: 43	631, Count 4: 37181	
Cou	ount 1: 43550, Count 2: 40912, Count 3: 43	546, Count 4: 37185	
Cou	ount 1: 43544, Count 2: 40905, Count 3: 43	631, Count 4: 37185	





3 Hardware

3.1 PSOC[™] 4700S Plus device

The CY8CKIT-4700S-PLUS kit comes with the PSOC[™] 4700S Plus device CY8C4747LQS soldered onto the board.

Table 3IC socket description

Reference	Manufacturer	Part number	Size	Supported package
U31	Infineon Technologies	CY8C4747LQS	8 mm × 8 mm	40-QFN



Figure 7 PSOC[™] 4700S Plus MCU device

3.2 Power supply

The following are power inputs:

- 5 V from the USB connector (J1)
- 5 V from J19 header battery connector

Note: Connect any one of the power inputs to the board, do not power the device simultaneously with both the above options.



Figure 8 Power supply configuration



3.3 Inductive sense buttons

The CY8CKIT-4700S-PLUS kit has three on-board sensor buttons and one on-board proximity sensor coil. The sensors use the inductive button coil and proximity sensor coil which are connected to LX and RX each. It works on the principle of oscillator-based inductive sensing.

Three dedicated LEDs are available on-board (LED8, LED9 and LED10) to indicate the events on the sensor buttons (BTN1, BTN2 and BTN3) and four LEDs (LED3, LED4, LED5 and LED6) are available to indicate the events on the proximity sensor (PROXIMITY).



Figure 9 Inductive sensor buttons and proximity sensor

3.4 KitProg3 USB program interface

KitProg3 is the Infineon low-level communication firmware for programming and debugging. It provides communication between the programming tool (Auto Flash Utility) and a target PSOC[™] 4700S Plus device.

KitProg3 uses the industry-standard Serial Wire Debug (SWD) protocol. It uses CMSIS-DAP V2.0.0 and V1.2.0 as the bulk and HID endpoint transport mechanisms.

KitProg3 also supports bridging: USB-to-UART and USB-I2C. For more information, see the KitProg user guide.



Figure 10 KitProg3 USB program interface

Note:

By default, the bridging between the KitProg3 and CPU is configured for the USB-to-UART interface. To use the USB-I2C bridge on the kit, remove the resistors from the UART position and install resistors in the I2C position, see Figure 10.



3.5 Extension headers

The CY8CKIT-4700S-PLUS kit provides a variety of header expansions to be compatible with the most popular interfaces. The kit is designed to have an connection header compatible with Arduino (1), Infineon standard connector interface (2), mikroBUS header (4), Groove connector and XENSIV[™] bus (3).



Figure 11 Extension headers on the kit



3.5.1 Arduino-compatible header

Connector	Pin number	Pin name	CY8CKIT-4700S-PLUS kit connections
J28	1	NC	-
J28	2	IOREF	VDDD (5V)
J28	3	RESET	XRES
J28	4	3V3	3P3V_LDO
J28	5	5V	VBUS (5V)
J28	6	GND	GND
J28	7	GND	GND
J28	8	VIN	VBAT
J29	1	A0	P2.5
J29	2	A1	P2.3
J29	3	A2	P2.4
J29	4	A3	P2.6
J29	5	A4/SDA	P1.1
J29	6	A5/SCL	P1.0
J30	1	D0/RX	P1.0
J30	2	D1/TX	P1.1
J30	3	D2	P0.2
J30	4	D3	P0.3
J30	5	D4	P4.0
J30	6	D5	P3.7
J30	7	D6	NC
J30	8	D7	P3.6
J31	1	D8	P3.5
J31	2	D9	P3.4
J31	3	D10/SS	TP13
J31	4	D11/MOSI	P6.0
J31	5	D12/MISO	P6.1
J31	6	D13/SCK	P6.2
J31	7	GND	GND
J31	8	AREF	VDDD
J31	9	SDA	P6.1
J31	10	SCL	P6.0



3.5.2 Infineon standard header

Table 5 Pin assignment of Infineon standard connections				
Connector	Pin number	CY8CKIT-4700S-PLUS kit connections		
J11	1	3P3V_LDO		
J11	2	DGND		
J11	11	VDDD		
J11	27	P2_5		
J11	30	P0_0		
J11	32	P0_1		
J11	33	P1_0		
J11	34	VBUS		
J11	35	P1_1		
J11	36	VBUS		
J11	37	P3_4		
J11	38	VBUS		
J11	39	DGND		
J11	40	5V_LDO		
J25	1	3P3V_LDO		
J25	2	DGND		
J25	10	P6_2		
J25	12	P6_1		
J25	14	P6_0		
J25	20	P3_5		
J25	22	P3_1		
J25	24	P3_0		
J25	26	P3_6		
J25	28	P3_7		
J25	30	P4_0		
J25	32	P0_3		
J25	34	P0_2		
J25	39	DGND		
J25	40	5V_LDO		



3.5.3 XENSIV[™] header

Table 6	Pin assignment of XENSIV™ bus connections				
Connector	Pin number	Pin name	CY8CKIT-4700S-PLUS kit connections		
S2G1	1	5V	VBUS		
S2G1	2	AN1	P2.5		
S2G1	3	AN1	P2.3		
S2G1	4	SDA	P1.1		
S2G1	5	SCL	P1.0		
S2G1	6	GND	GND		
S2G1	7	3V3	3P3V_LDO		
S2G1	8	INT	NC		
S2G1	9	PWM	P3.4		
S2G1	10	MISO	P6.1		
S2G1	11	MOSI	P6.0		
S2G1	12	CLK	P6.2		
S2G1	13	CS	P3.7		
S2G1	14	GPIO	NC		
S2G1	15	RST	P3.5		
S2G1	16	ТХ	P1.1		
S2G1	17	RX	P1.0		



3.5.4 mikroBUS-compatible header

Table 7	Pin assignment of mikroBUS-compatible connections				
Connector	Pin number	Pin name	CY8CKIT-4700S-PLUS kit connections		
J32	1	AN	P2.5		
J32	2	RST	P3.5		
J32	3	CS	P3.7		
J32	4	SCK	P6.2		
J32	5	MISO	P6.1		
J32	6	MOSI	P6.0		
J32	7	3V3	3P3V_LDO		
J32	8	GND	GND		
J33	1	GND	GND		
J33	2	5V	VBUS_5V		
J33	3	SDA	P1.1		
J33	4	SCL	P1.0		
J33	5	ТХ	P1.1		
J33	6	RX	P1.0		
J33	7	INT	P3.7		
J33	8	PWM	P3.4		

3.5.5 Groove header

Table 8Pin assignment of Groove bus connections

Connector	Pin number	Pin name	CY8CKIT-4700S-PLUS kit connections
J26	1	SCL	P6.0
J26	2	SDA	P6.1
J26	3	3V3	3P3V_LDO
J26	4	GND	GND



3.6 Other peripherals

The GPIO pins are grouped into ports; a port can have up to eight GPIOs. See Table 9 for GPIO pin assignments of the CY8CKIT-4700S-PLUS kit board. Table 9 shows the connection to other peripherals.

#	GPIO pin assignment	Description
1	XRES pin	Connected to an external reset button (SW2) with a 0.1 μ F capacitor
2	User button	SW3 (GPIO P0.2)
3	User LEDs	LED7 (GPIO P0.3 - green)
4	ECO	External crystal oscillator up to 16 MHz
5	WCO	Watch crystal oscillator up to 32.768 kHz

Table 9GPIO pins used by peripherals



Figure 12 Onboard peripheral



Programming and debugging

4 Programming and debugging

4.1 Program and debug using ModusToolbox[™] workspace

1. Create a new workspace in documents folder and copy the unzipped code example folder to the same.

				_	ПХ
File Home Share View					
Pin to Quick Copy access	Move Copy to * to *	New item •	Properties	Select all Select none	
Clipboard	Organize	New	Open	Select	
← → ✓ ↑ 📜 > This PC > Docur	nents > Mtb_Workspace > CY8C	KIT4700SPLUS	~	ບ 🔎 Sear	ch CY8CKIT47
^ Name	^	Date modified	Туре	Size	
	T_4700SPLUS_E1_COMBINED	27-09-2023 05:20 PM	File folder		
Downloads 🖈					
Documents 🖈					
E Pictures 🖈					
01_WORK					
O CY8CKIT_4/00SP					
Datasneets and (
Mth Workspace					
ivito_vvorkspace					
🤓 My Sync					
🔵 OneDrive - Person					
🧢 This PC					
🧊 3D Objects 🗸 🧹					
1 item					:==

Figure 13 Creating workspace and copying code example folder

2. Open ModusToolbox[™] (Eclipse IDE for ModusToolbox[™] v3.3), browse and choose the created workspace from step 1 and launch.

\mathbb{X}	Eclipse IDE for ModusToolbox™ Launcher	×
Se	elect a directory as workspace	
E	clipse IDE for ModusToolbox [™] uses the workspace directory to store its preferences and development artifacts.	
W	/orkspace: ⁹ jendranAis\Documents\Mtb_Workspace\CY8CKIT4700SPLUS v Browse	
	Use this as the default and do not ask again Recent Workspaces	
	Launch Cancel	

Figure 14 Launching the workspace



Programming and debugging

3. Import the project to ModusToolbox[™] by following these steps: **File** > **Import** > **General** > **Existing Projects** into workspace. Click **Next**, under Select root directory, click **Browse** and choose the copied code example folder.

Check on the "Copy projects into workspace" checkbox and click Finish.

Import – D X	Import – – × Import Projects
Select	Select a directory to search for existing Eclipse projects.
Create new projects from an archive file or directory.	Select root directory: C:\Users\RajendranAis\Documents\Mtb_Workspace Browse
	O Select archive file: Browse
Select an import wizard:	Projects:
type filter text	CY8CKIT_4700SPLUS_E1_COMBINED (C:\Users\RajendranAis\Documents\)
	Deselect All
Archive File	Kefresh
Projects into Workspace	
i File System	
Preferences	< >>
C Projects from Folder or Archive	Options
> 🗁 C/C++	Copy projects into workspace
> 🗁 Git	Close newly imported projects upon completion
> 🗁 Install 🗸 🗸	Working sets
	Add project to working sets New
	Working sets: Select
(?) < Back Next > Finish Cancel	() < Back Next > Finish Cancel

Figure 15 Importing the project to ModusToolbox™

4. In terminal window, run the command: "make getlibs" and wait for the importing to complete.

📮 Console 🔝 Problems 🔋 Memory 🦻 Terminal 🛛	😼 = 🖏 🗊 🗐 🖓 🖳
Q CY8CKIT_4700SPLUS_E1_COMBINED ModusShell X	
ajendranAis@ISCNPF1B5P2V ~/Documents/Mtb_Workspace/CY8CKIT4700SPLUS/CY8CKIT_4700SPLUS_E1_COMBINED make getlibs	,

Figure 16 Terminal window command

- 5. Select the project in the project explorer. Build the application from the Quick Panel.
- 6. Connect the board to the PC using the given USB connector.



Programming and debugging

7. Run the application by selecting the "*Project_Name Program (KitProg3_MiniProg4)*" under the launches in the Quick Panel.



Figure 17 Running the application

- 8. Ensure that the project name is mentioned correctly; otherwise, generate the launches and then run the program.
- 9. Observe that the user LED (LED7) toggles every time the user button (SW3) is pressed and on every touch on the inductive sense buttons (BTN1, BTN2, BTN3), the respective LED (LED8, LED9, LED10 respectively) glows using a metal target the functionalities of the proximity sensor can be detected.
- 10. Also, open the terminal (for example, Termite or Tera Term), choose the right Com port: Kit_Prog port and set the baud rate to 19200. Figure 18 shows the raw counts of all the sensors are listed in the terminal window.

😗 Termite 3.4 (by CompuPhase) — 🗆	×
CM49 19200 bps, 8N1, no handshake Settings Clear About	Close
? Local RTS DTR Remote CTS DSR RI CD ERR	BREAK
PSoC 4 MCU UART transmit and receive	^
Count 1: 43541, Count 2: 40902, Count 3: 43627, Count 4: 37181	
Count 1: 43540. Count 2: 40903. Count 3: 43626. Count 4: 37180	
Count 1: 43632 Count 2: 40903 Count 3: 43542 Count 4: 37180	
Count 1: 43547, Count 2: 40910, Count 3: 43638, Count 4: 37185	
Count 1: 43543 Count 2: 40905 Count 3: 43544 Count 4: 37180	
Count 1: 43627, Count 2: 40901, Count 3: 43542, Count 3: 476	
Count 1: 43548 Count 2: 40910 Count 3: 43548 Count 4: 37185	
Count 1, 43540, Count 2, 40510, Count 3, 45540, Count 4, 57105	
Count 1, 45541, Count 2, 40903, Count 3, 45544, Count 4, 57173	
Count 1: 43539, Count 2: 40907, Count 3: 43635, Count 4: 37179	
Count 1: 43541, Count 2: 40909, Count 3: 43535, Count 4: 37182	
Count 1: 43636, Count 2: 40907, Count 3: 43548, Count 4: 37179	
Count 1: 43627, Count 2: 40900, Count 3: 43541, Count 4: 37179	
Count 1: 43537, Count 2: 40900, Count 3: 43542, Count 4: 37177	
Count 1: 43539, Count 2: 40900, Count 3: 43625, Count 4: 37180	
Count 1: 43632, Count 2: 40905, Count 3: 43632, Count 4: 37179	
Count 1: 43631, Count 2: 40907, Count 3: 43631, Count 4: 37181	
Count 1: 43550, Count 2: 40912, Count 3: 43546, Count 4: 37185	
Court 1: 43544 Court 2: 40905 Court 3: 43631 Court 4: 37185	

Figure 18 Terminal output

Note:

The mtb_shared folder will be present in the ModusToolbox™_worspace folder and can be copied to the IDE is required. However, it is not mandatory to import it.



Schematics and designs

5 Schematics and designs

5.1 CY8CKIT-4700S-PLUS kit schematics

The section provides the CY8CKIT-4700S-PLUS kit schematics.



Schematics and designs

user guide Automotive

PSOC™ 4700S Plus: CY8CKIT-4700S-PLUS Evaluation Kit

Infineon

CY8CKIT-4700S-PLUS CONTENTS PAGE DESCRIPTION 01 Title, Table of Contents & Drawing Numbers 02 Block Diagram KitProg3 03 04 Peripherals and Power 05 PSOC™ 4700S PLUS 06 Arduino Connectors 07 Inductive Sensing Interface 08 Revision History **Drawing Number** PCBA 121-60695-01 PCB 600-60695-01 with of constitution of characteristics. With an original with the second state of th FAB DRW 610-60695-01 Legal Disclaime SCH Title : CY8CKIT-4700S-PLUS The Ink as a gu Page Title: Title Page ASSY DRW 620-60695-01 infineon and/or a Size Document Number Drawn By Approved By SCH DRW 630-60695-01 630-60695-01 RASB BOYA A4 01 Date: Thursday, November 14, 2024 1 of

Figure 19 CY8CKIT-4700S-PLUS kit schematic



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Schematics and designs



Figure 20 CY8CKIT-4700S-PLUS kit block diagram





Schematics and designs



Figure 21 PSOC[™] 5LP-based KitProg3 schematics

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J19

HDR 2

TP14 TP15

User LED

PSOC^m 5LP Program/

Debug Connector

P5LP VDD

Reset

SW2

0 Ohn

R101

R103

0 Ohm

B9R ~

0 Ohm

0 Ohm

PTS810SJG250SMTRLFS

0603 SUART_TX

0603 (UART_RX

HDR 5

VTARG

XRES>>

UART RX HV

UART TX HV

R24 15K 0402

C22

=0.1uE

50V 0402

Note: The RC circuit for Reset is not mandatory for circuit to be operational.

 \Leftrightarrow

DNI - Do Not Insert (No Load)

DNI

User guide

SG User Switch VTARG R131 15K 0402 P0_2 SW3 \Leftrightarrow PTS810SJG250SMTRLFS Communication Lines R94 R95 0402 040 P3_0(()) 0 Ohm 0 Ohm R96 **R97** 0402 DNI P3_K(>> <0>P1_ 0 Ohm 0 Ohm

CY8CKIT-4700S-PLUS kit peripherals

USB Micro Connector

BUS J

100K

C21 0.01uF 50V 0402

040

R22

VBUS

DM

ID GND

> SH SH SH

> SH

USB micro

VBUS

MF-MSMF060-2

KP_DM

XXKP DP

CG0603MLC-05LE CG0603MLC-05LE

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Figure 22

User guide

Schematics and designs user guide Automotive PSOC[™] 4700S Plus: CY8CKIT-4700S-PLUS Evaluation Kit



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ECO Crystal WCO Crystal R48 0 Ohm XTAL_16M_IN R46 0 Ohm XTAL_32K_IN P0_6 >>-P0 4 N R47 0 Ohm XTAL_16M_OUT P0 7 55 O Ohm XTAL_32K_OUT E d F XTAL 16M IN C28 C83 XTAL_32K_IN ~ 10pF Y2 PSOC™ 4700S Plus Device 12pF Y1 32.768KHz XTAL 16M OUT C26 VDDD VCCD XTAL 32K OUT C84 Т 10-1 7 ABM10-16.000MHZ-D30-T3 4886688 5 8 U31 REF P1.4 P1.2 P1.2 P1.2 P1.2 DD D 8 R123 0 Ohm 2 3 10 P2 3 📎 P2.3 P2.4 P2.5 P2.6 P2 XRES P0.7 P0.6 P0.5 P0.4 P0.3 P0.2 P0.1 P0.0 XRES | 29 28 R134 0 Ohm >>>2 4 10 P2 4 5 4 E. Test Points P2 P2 R125_00hm >>>2 6 10 P2 6 \\ P2.6 P2.7 P6.0 P6.1 P6.2 P3.0 P3.1 P3.2 CY8C4747LQS-S453 26 25 Pŧ VTARG VCCD VDDD VBUS 8 10 24 23 P3 P3 VSSD VSSD VSSA EPAD -OTP16 R2 R3 12 SWDCLK SWDIO 22 2P3 3 0 Ohm -OTP17 OTP18 4 32 o OTP20 4 OTP21 ¢ 222222222 Programming Header Decoupling Capacitors System Capacitors R116 0402 WRES XRES L>> VDDD VCCD VDDD 0 Ohm C72 470pF 50V C44 =470pF 50V C71 =2200pF 50V -C54 1uF 10V C52 C69 CintA CintB CMOD XRES 1uF 10V VCCD 0.1uF 16V 0.1uF 16V 1uF 10V 4 VDDD \Leftrightarrow \Leftrightarrow ✧ \Leftrightarrow HDR 8 0.0hm DNI 4 **B132** ↔ DN Legal Disclaimer : The Information glues a guarantee of c SCH Title : CY8CKIT-4700S-PLUS nation given in this antee of conditions no event be re anua of conditions or characteristics. With respect to a or initis given herein, any typical values state d herein y information regarding the application of the device, fectnologies hereby disclaims any and all warranties an of any kind, belution without much all warranties and of any kind, belution without much all warranties and of any kind. Page Title: PSOC™ 4700S PLUS infineon Sim Document Number Drawn B Approved By s of any kir A4 630-60695-01 RASB BOYA Date: Thursday, November 14, 2024 5 of Sheet Figure 23 **CY8CKIT-4700S-PLUS kit schematics**

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Figure 24 CY8CKIT-4700S-PLUS kit components schematics

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Schematics and designs





Figure 25 CY8CKIT-4700S-PLUS kit Arduino-compatible header schematics

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Schematics and designs

5.2 CY8CKIT-4700S-PLUS kit assembly drawings

This section shows the CY8CKIT-4700S-PLUS kit assembly drawings.



Figure 26 CY8CKIT-4700S-PLUS kit assembly drawing (top view)



Figure 27 CY8CKIT-4700S-PLUS kit assembly drawing (bottom view)



References

References

- [1] 002-34139: Automotive PSOC[™] 4 MCU: PSOC[™] 4700S Plus datasheet
- [2] 001-96359: KitProg user guide
- [3] 002-24616: KitProg3 user guide

For more information, see Automotive PSOC[™] 4700S Plus webpage and contact Infineon Support to obtain this document.



Glossary

Glossary

LED light emitting diode

MCU microcontroller

MTB ModusToolbox™

PCB printed circuit board

PWM pulse width modulation

USB Universal Serial Bus



Revision history

Revision history

Document revision	Date	Description of changes	
**	2023-12-11	Initial release.	
*A	2024-11-19	Publish to web.	

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