Segment Display example project
1.10

Features

- Bar graph, 7 Segment and 14 Segment helpers
- Always active mode operation
- Refresh rate – 100 Hz
- Type A waveforms
- PSoC5 devices

General Description

This example project demonstrates the Segment Display component operation in Always Active mode. In this example project, Bar graph, 7 Segment and 14 Segment helpers handle data processing and proper pixel reflection output on the LCD's Bar graph, 7 segments or 14 Segment digits. You will need a PSoC3/5 DVK CY8CKIT-001 and PSoC® LCD Segment Drive Expansion Board Kit CY8CKIT-029. The LCD expansion board has to be connected to port A of CY8CKIT001. Bar graph, 7 Segment and 14 Segment helpers handle data processing and proper pixel reflection output on LCD's Bar graph, 7 Segment digits or 14 Segment characters.

Development kit configuration

You will need a PSoC3/5 DVK CY8CKIT-001 and PSoC® LCD Segment Drive Expansion Board Kit CY8CKIT-029. The LCD expansion board has to be connected to port A of CY8CKIT001 as shown in Figure 1. Build the project and program the hex file on to CY8C5588AXI-060 using MiniProg3

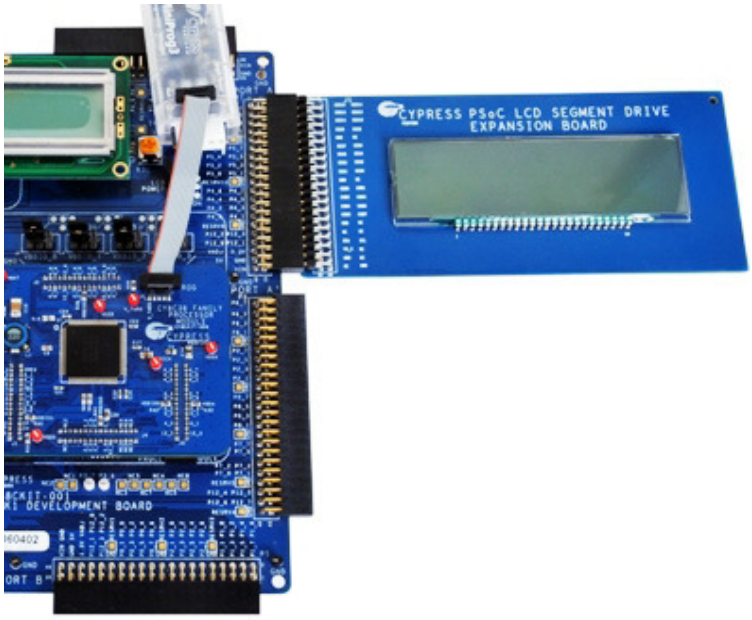


Figure 1. LCD Expansion Board Connection to PSoC3/5 DVK

Component configuration

There are no other components required so the design is pretty simple. The Segment LCD configuration should be set as on the following diagrams:

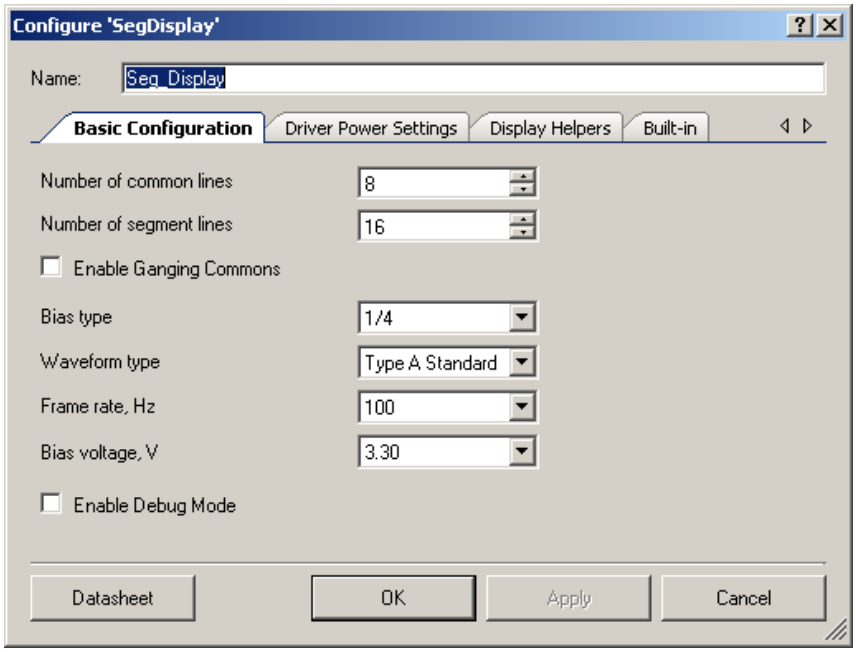


Figure 2. Basic Configuration window.

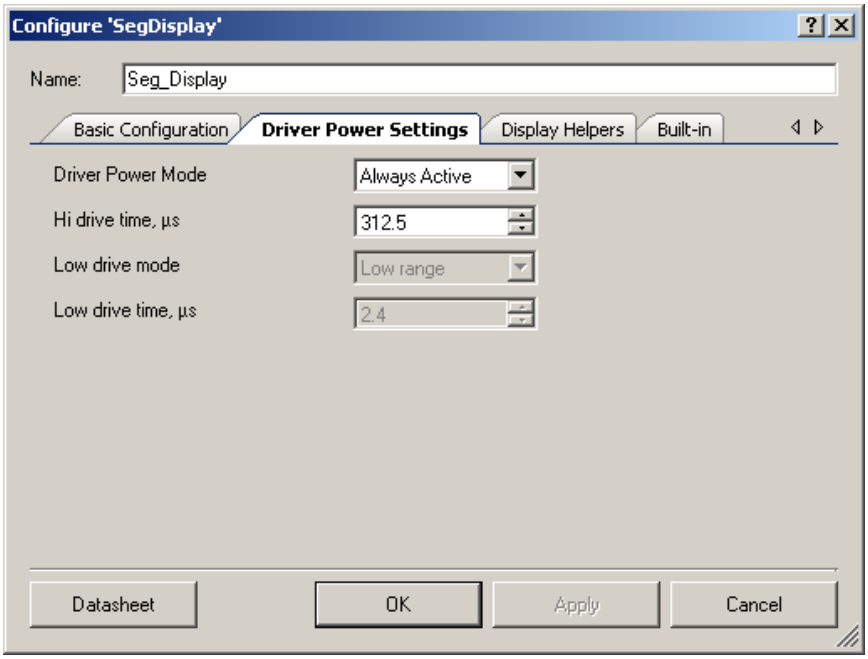
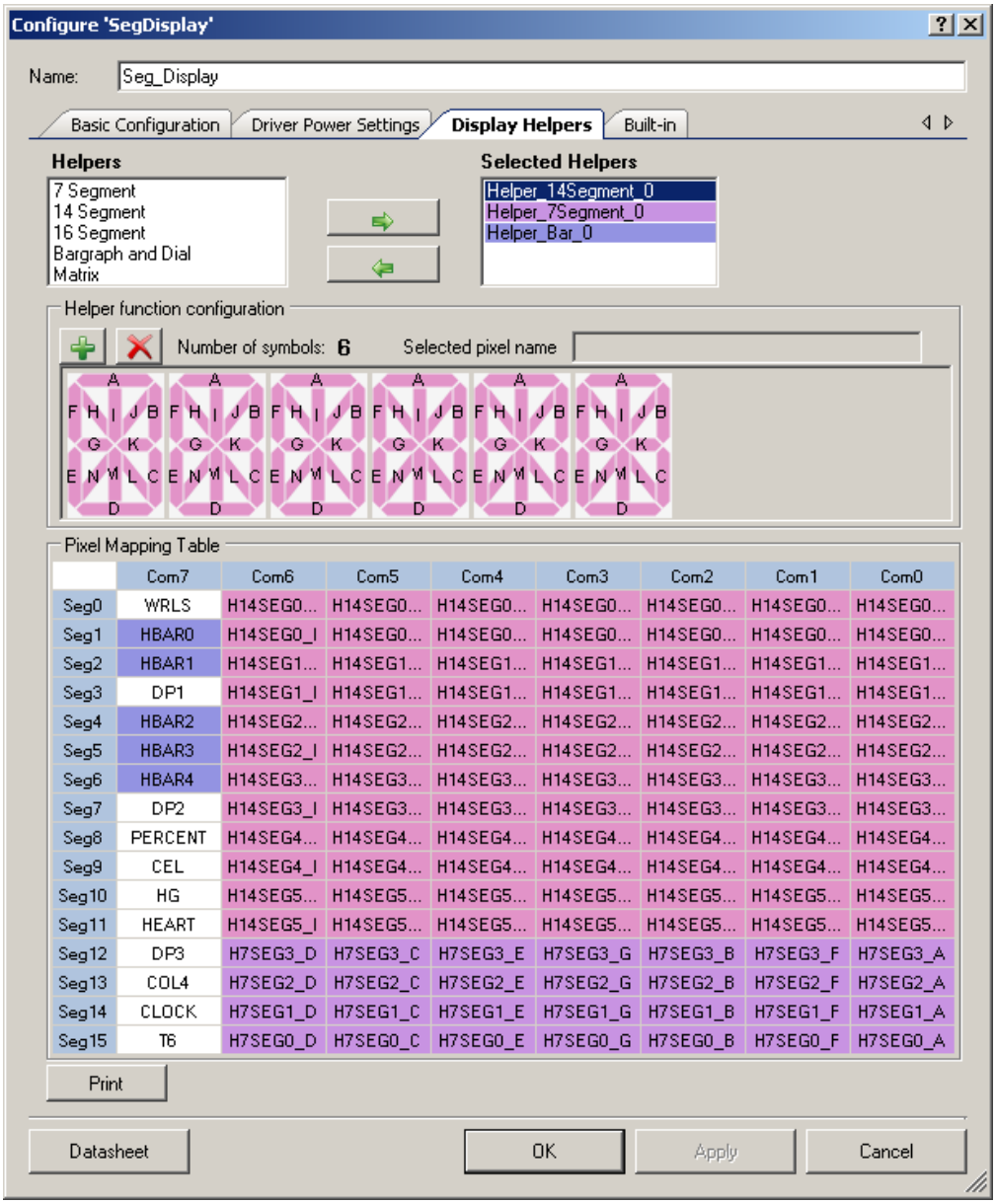


Figure 3. Driver Power settings window.



	Com7	Com6	Com5	Com4	Com3	Com2	Com1	Com0
Seg0	WRLS	H14SEG0...	H14SEG0...	H14SEG0...	H14SEG0...	H14SEG0...	H14SEG0...	H14SEG0...
Seg1	HBAR0	H14SEG0_I	H14SEG0...	H14SEG0...	H14SEG0...	H14SEG0...	H14SEG0...	H14SEG0...
Seg2	HBAR1	H14SEG1...	H14SEG1...	H14SEG1...	H14SEG1...	H14SEG1...	H14SEG1...	H14SEG1...
Seg3	DP1	H14SEG1_I	H14SEG1...	H14SEG1...	H14SEG1...	H14SEG1...	H14SEG1...	H14SEG1...
Seg4	HBAR2	H14SEG2...	H14SEG2...	H14SEG2...	H14SEG2...	H14SEG2...	H14SEG2...	H14SEG2...
Seg5	HBAR3	H14SEG2_I	H14SEG2...	H14SEG2...	H14SEG2...	H14SEG2...	H14SEG2...	H14SEG2...
Seg6	HBAR4	H14SEG3...	H14SEG3...	H14SEG3...	H14SEG3...	H14SEG3...	H14SEG3...	H14SEG3...
Seg7	DP2	H14SEG3_I	H14SEG3...	H14SEG3...	H14SEG3...	H14SEG3...	H14SEG3...	H14SEG3...
Seg8	PERCENT	H14SEG4...	H14SEG4...	H14SEG4...	H14SEG4...	H14SEG4...	H14SEG4...	H14SEG4...
Seg9	CEL	H14SEG4_I	H14SEG4...	H14SEG4...	H14SEG4...	H14SEG4...	H14SEG4...	H14SEG4...
Seg10	HG	H14SEG5...	H14SEG5...	H14SEG5...	H14SEG5...	H14SEG5...	H14SEG5...	H14SEG5...
Seg11	HEART	H14SEG5_I	H14SEG5...	H14SEG5...	H14SEG5...	H14SEG5...	H14SEG5...	H14SEG5...
Seg12	DP3	H7SEG3_D	H7SEG3_C	H7SEG3_E	H7SEG3_G	H7SEG3_B	H7SEG3_F	H7SEG3_A
Seg13	COL4	H7SEG2_D	H7SEG2_C	H7SEG2_E	H7SEG2_G	H7SEG2_B	H7SEG2_F	H7SEG2_A
Seg14	CLOCK	H7SEG1_D	H7SEG1_C	H7SEG1_E	H7SEG1_G	H7SEG1_B	H7SEG1_F	H7SEG1_A
Seg15	T6	H7SEG0_D	H7SEG0_C	H7SEG0_E	H7SEG0_G	H7SEG0_B	H7SEG0_F	H7SEG0_A

Figure 4. Display Helpers window

Display helpers tab contains pixel mapping configuration and it should match pixel mapping configuration LCD glass.

PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
COM8	COM8								T7	S1	S2	COL1	S3	S4	S5	COL2	T1	T4	T2	T3	COL3	COL4	T5	T6
COM7		COM7							1A	1J	2A	2J	3A	3J	4A	4J	5A	5J	6A	6J	10D	9D	8D	7D
COM6			COM6						1P	1K	2P	2K	3P	3K	4P	4K	5P	5K	6P	6K	10C	9C	8C	7C
COM5				COM5					1F	1B	2F	2B	3F	3B	4F	4B	5F	5B	6F	6B	10E	9E	8E	7E
COM4					COM4				1G	1L	2G	2L	3G	3L	4G	4L	5G	5L	6G	6L	10G	9G	8G	7G
COM3						COM3			1E	1C	2E	2C	3E	3C	4E	4C	5E	5C	6E	6C	10B	9B	8B	7B
COM2							COM2		1M	1R	2M	2R	3M	3R	4M	4R	5M	5R	6M	6R	10F	9F	8F	7F
COM1								COM1	1N	1D	2N	2D	3N	3D	4N	4D	5N	5D	6N	6D	10A	9A	8A	7A

Figure 5. LCD Glass pixel mapping table.

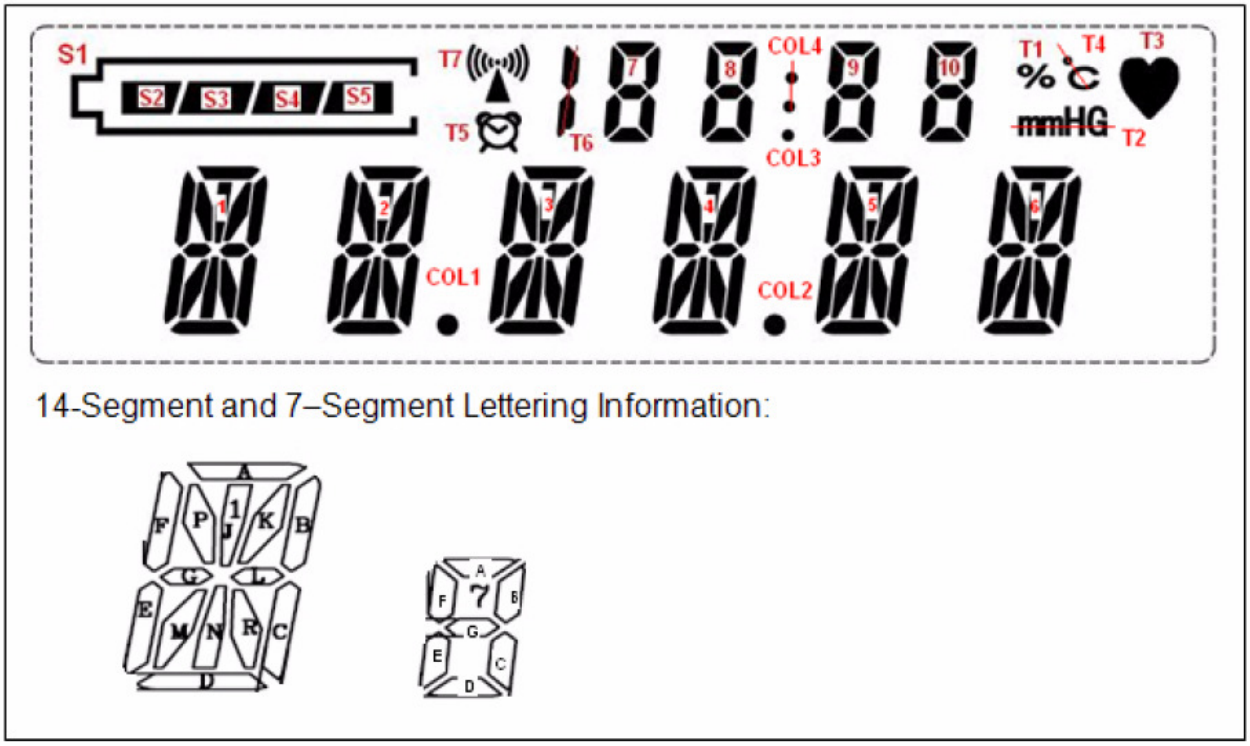


Figure 6. LCD Glass lettering information.

Project description and setup

This example project designed to demonstrate the operation of different helpers in one design. It uses 7 segment, Bargraph and 14 Segment helpers. The general idea of the design is in sequential displaying of the 14 segment characters using their ASCII codes. The ASCII codes of characters for the 14 segment helper are lying in the range from 0 to 128, so this example project displays one line of six 14 Segment characters for ones. And the two pushbuttons are used to “navigate” through the characters. 7 Segment helper is used to display the range of ASCII numbers of characters that are currently displayed on the LCD in hexadecimal format. Bargraph helper shows the progress of the “navigation” through the 14 Segment Helper characters.

Component setup was described above and the PSoC3/5 DVK CY8CKIT-001 is also required to be properly set up. At the beginning CY8CKIT-029 should be plugged to Port A of CY8CKIT-001. The Segment Display pins are already assigned to the correct places. The other thing that is required to be done manually is to connect the pushbuttons to proper pins. This is required because the pin components configured to generate an ISR each time the button is pressed. On the diagram below it is shown how the pins and buttons are connected. Button “SW1” (Rewind) is connected to Port 0 Pin 7 and Button “SW2” (Forward) is connected to Port 1 Pin 5

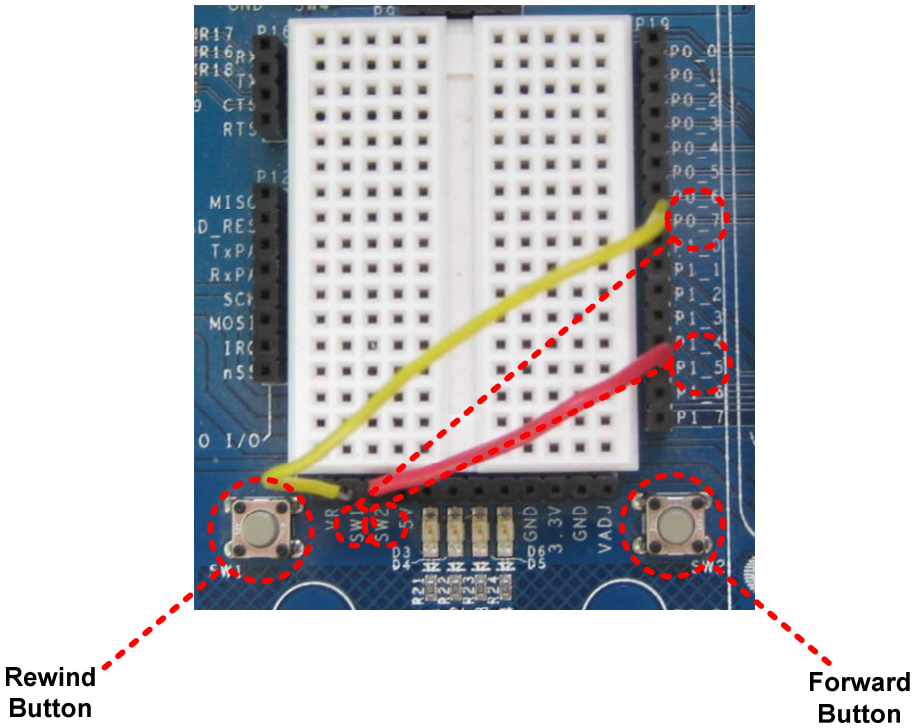


Figure 7. Buttons connections.

Expected results

The diagram below demonstrates a part of expected result of the example project. The screen capture shown corresponds to displayed character ASCII number range of 0x42 – 0x47.

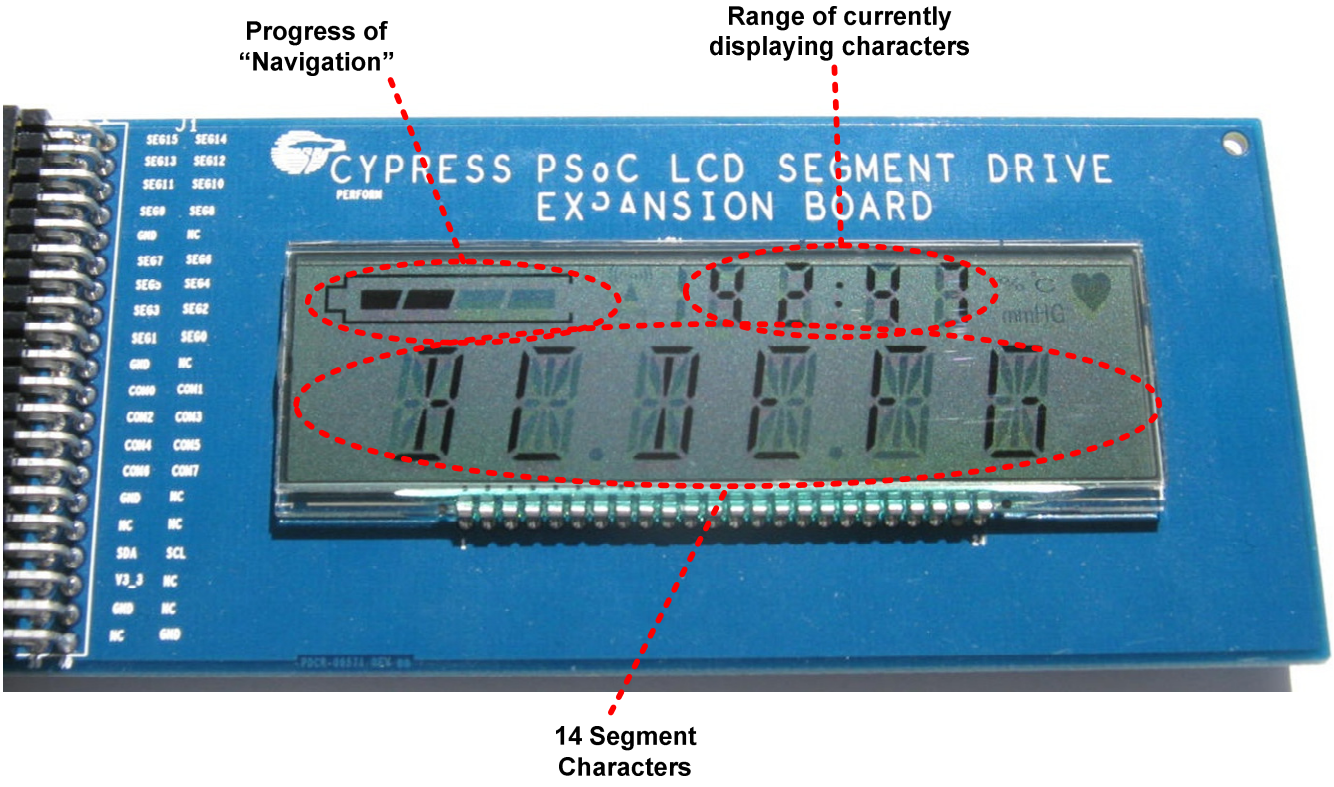


Figure 8. Expected result.

© Cypress Semiconductor Corporation, 2009-2012. The information contained herein is subject to change without notice. Cypress Semiconductor Corporation assumes no responsibility for the use of any circuitry other than circuitry embodied in a Cypress product. Nor does it convey or imply any license under patent or other rights. Cypress products are not warranted nor intended to be used for medical, life support, life saving, critical control or safety applications, unless pursuant to an express written agreement with Cypress. Furthermore, Cypress does not authorize its products for use as critical components in life-support systems where a malfunction or failure may reasonably be expected to result in significant injury to the user. The inclusion of Cypress products in life-support systems application implies that the manufacturer assumes all risk of such use and in doing so indemnifies Cypress against all charges.

PSoC® is a registered trademark, and PSoC Creator™ and Programmable System-on-Chip™ are trademarks of Cypress Semiconductor Corp. All other trademarks or registered trademarks referenced herein are property of the respective corporations.

Any Source Code (software and/or firmware) is owned by Cypress Semiconductor Corporation (Cypress) and is protected by and subject to worldwide patent protection (United States and foreign), United States copyright laws and international treaty provisions. Cypress hereby grants to licensee a personal, non-exclusive, non-transferable license to copy, use, modify, create derivative works of, and compile the Cypress Source Code and derivative works for the sole purpose of creating custom software and or firmware in support of licensee product to be used only in conjunction with a Cypress integrated circuit as specified in the applicable agreement. Any reproduction, modification, translation, compilation, or representation of this Source Code except as specified above is prohibited without the express written permission of Cypress.

Disclaimer: CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Cypress reserves the right to make changes without further notice to the materials described herein. Cypress does not assume any liability arising out of the application or use of any product or circuit described herein. Cypress does not authorize its products for use as critical components in life-support systems where a malfunction or failure may reasonably be expected to result in significant injury to the user. The inclusion of Cypress' product in a life-support systems application implies that the manufacturer assumes all risk of such use and in doing so indemnifies Cypress against all charges.

Use may be limited by and subject to the applicable Cypress software license agreement.