

Мікропроцесорна техніка

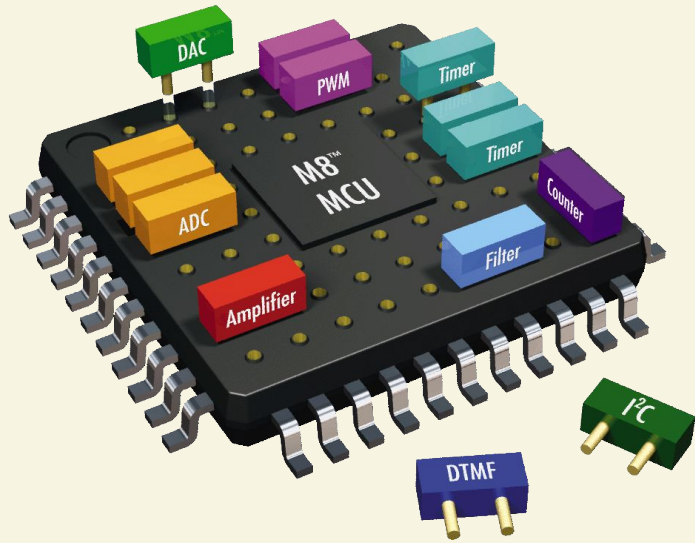
(лекція 1)
Благітко Б.Я.
2019 р.

PSoC Creator 4.2
Designing with PSoC 3/5



- Знайомство з PSoC 3/5
- Основні можливості мікроконтролера
- Інструментальні засоби розробки PSoC 3/5 Development kit
- Програмні засоби розробки Creator 3.0

Що таке PSoC 3/5?



PSoC 3/5 = Програмована система на кристалі для реалізації вбудовуваних систем **низької вартості з мінімальною кількістю зовнішніх компонент**

PSoC 3/5 включає в себе можливість обробки аналогових, цифрових і змішаних сигналів, а також можливість формування аналогових і цифрових сигналів, охоплюючи широкий спектр прикладних задач

- **Особливості PSoC 3/5:**
 - Реконфігуровувані Аналогові модулі:
 - Вбудовані АЦП і ЦАП, аналогові фільтри різних типів, підсилювачі аналогових сигналів, компаратори, аналогові модулятори і т. д.
 - Реконфігуровувані Цифрові модулі:
 - Вбудовані таймери, лічильники, PWM, UART, SPI, IrDA, I2C і т. д.
 - Flash від 4КВ до 32КВ для зберігання програми
 - SRAM от 256В до 2КВ для зберігання даних
 - Процесорне ядро - МК8051, CISC, 4MIPS

Фільтри

- 2-4 полюсні фільтри на комутованих конденсаторах низьких частот, смугові, загороджувальні, верхніх частот

Підсилювачі

- Підсилювач із програмованим коефіцієнтом підсилення
- Інструментальні підсилювачі
- Інвертуючі підсилювачі

Програмовані компаратори

- Компаратор із програмованим порогом спрацювання
- Тригер Шмідта із програмованим порогом спрацювання

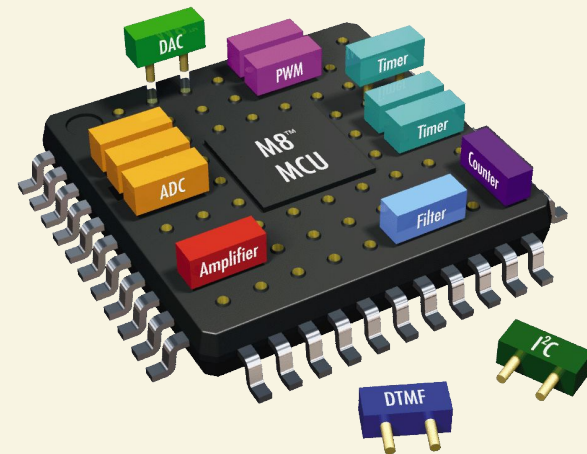
DTMF генератор і детектор

А/Ц Перетворювачі

- Послідовного наближення
- Сигма-дельта 8-14 біт
- Накоплювальний 8-14 біт

Ц/А Перетворювачі

- 6, 8, и 9-бітні ЦАП
- 6 и 8-бітні перемножуючі ЦАП



8, 16, 24, 32-бітні таймери

8, 16, 24, 32-бітні лічильники імпульсів

8, 16-бітні ШІМ

8, 16-бітні Dead Band Генератори

- (генерація 2-о фазних сигналів для управління силовими ключами)

Генератори псевдо-випадкових сигналів (PRS)

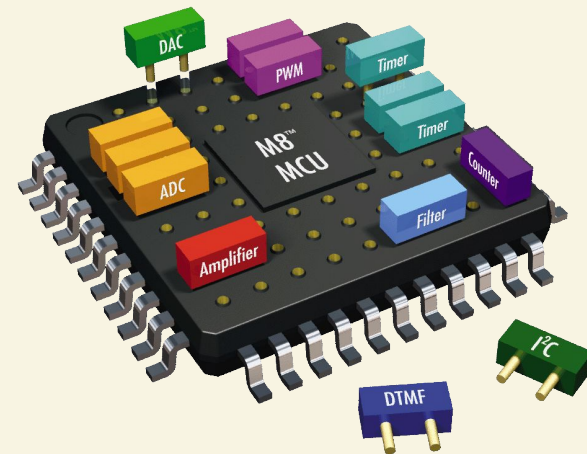
Генератори цифрових контрольних сум (CRC)

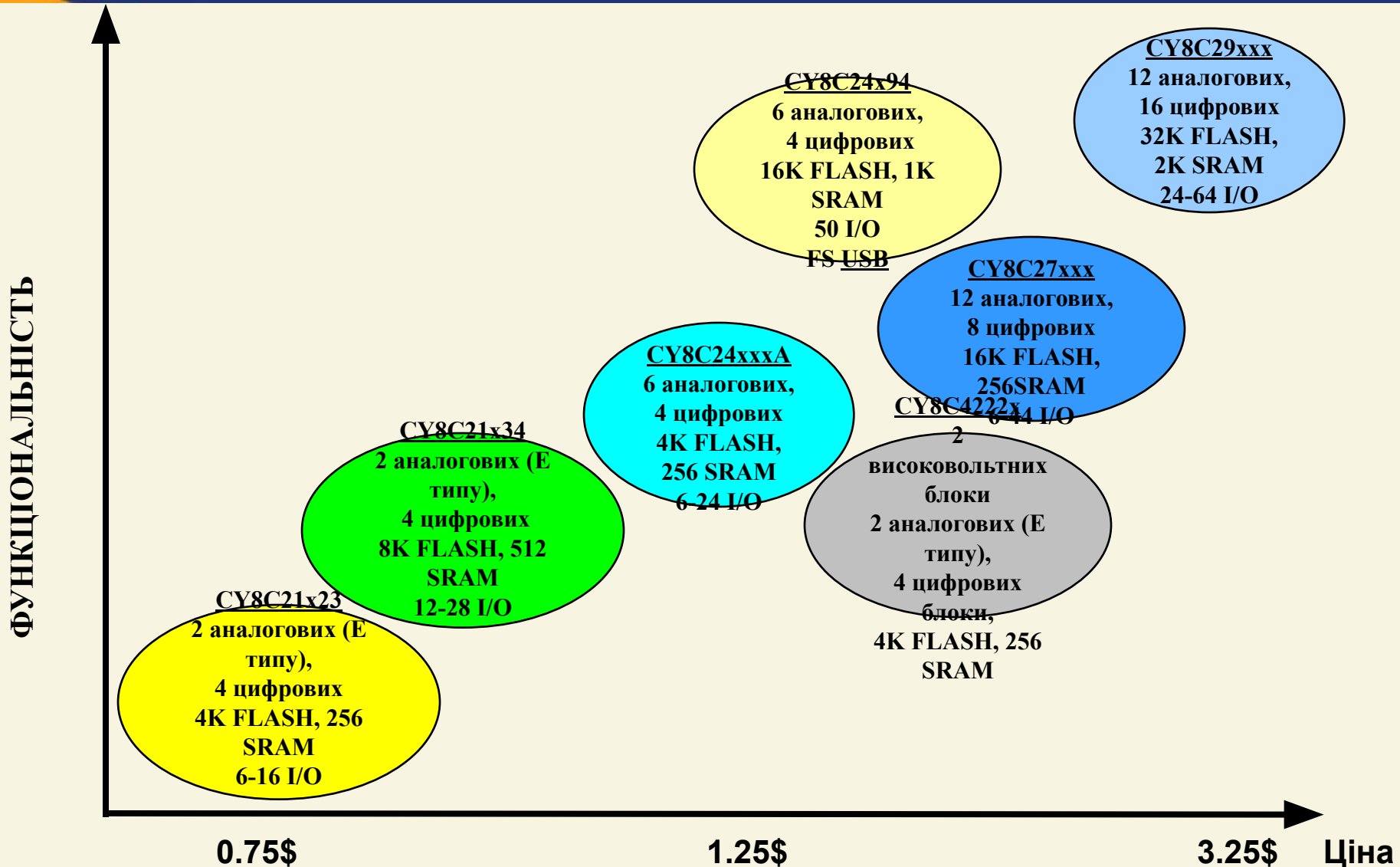
I²C майстер/підлеглий

SPI майстри/підлегли

Повнодуплексні UART

IrDA приймачі та передавачі





Всі кристали сімейства PSoC не містять Pb починаючи з 2005 року!

- Номери елементів, які не містять Pb перед температурним кодом мають мітку 'X'
- Наприклад:

Стандартний номер елемента = CY8C27443-24PI

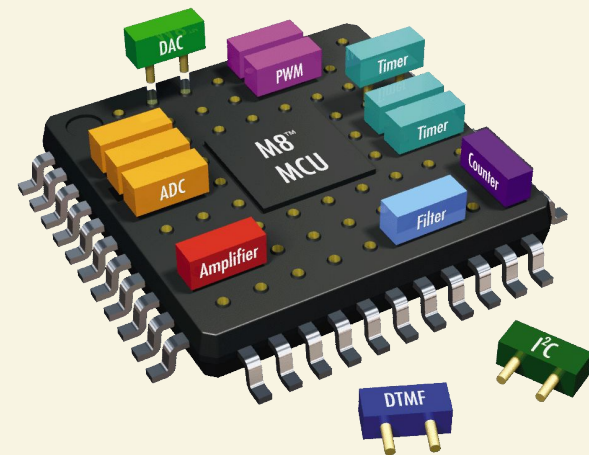
Номер елемента,

який не містить Pb

= CY8C27443-24PXI

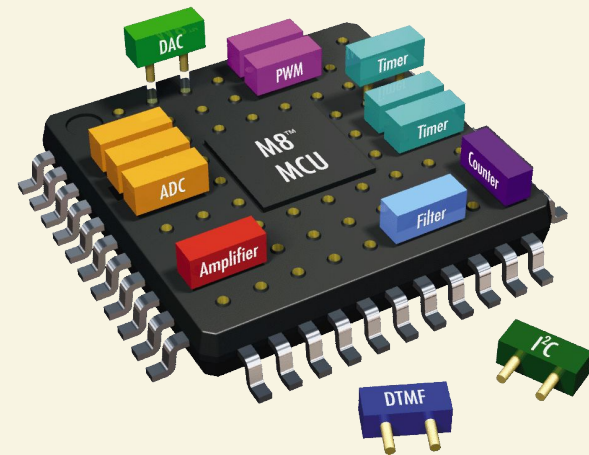


- Інтегроване середовище розробника PSoC Creator
- Оцінювальні плати
- Програматори
- Апаратні емулятори



PSoC Creator – це:

- Інтуїтивний інтерфейс
- Простота з'єднань
- Підтримка динамічної реконфігурації процесора



Оптимальними для PSoC являються задачі, коли необхідна обробка аналогових сигналів на апаратному рівні (підсилення, фільтрація, АМ/ФМ модуляція, демодуляція) із наступним перетворенням в цифрову форму в смузі аналогових сигналів до 100 кГц.

Виграш полягає в переносі зовнішніх дискретних компонентів у середину процесора.

PSoC Creator 2.1

File Edit View Debug Project Build Tools Window Help

Workspace Explorer

Source Components Datasheets Results

Start Page

PSoC® Creator™

简体中文 日本語 한국어 English

Recent Projects

- HelloWorld_Blinky01.cywrk
- CapSense_CSD_Design01...
- CapSense_CSD_Design01...
- CharLCD_CustomFont01.c...
- CharLCD_CustomFont01.c...

Create New Project...
Open Existing Project...

Getting Started

- PSoC Creator Start Page
- Quick Start Guide
- Intro to PSoC
- Intro to PSoC Creator
- PSoC Creator Training
- Help Tutorials
- Getting Started With PSoC 3
- Getting Started With PSoC 5

Examples and Kits

- Find Example Project...
- No Kit Packages Installed

PSoC Creator News and Information

Happy Lunar New Year!
Posted on 02/11/2013

Gong Xi Fa Cai! As many of my friends and colleagues are celebrating the New Year and welcoming in the year of the water snake, I wanted to take a minute and wish you all well. May the New Year bring each of you prosperity, good luck and a new PSoC design.
[Read More](#)

Tips + Tricks: Menu Customization
Posted on 01/24/2013

Did you know you can create a customized menu in PSoC® Creator? Right click in a blank area of the top menu and select customize from the

Notice List

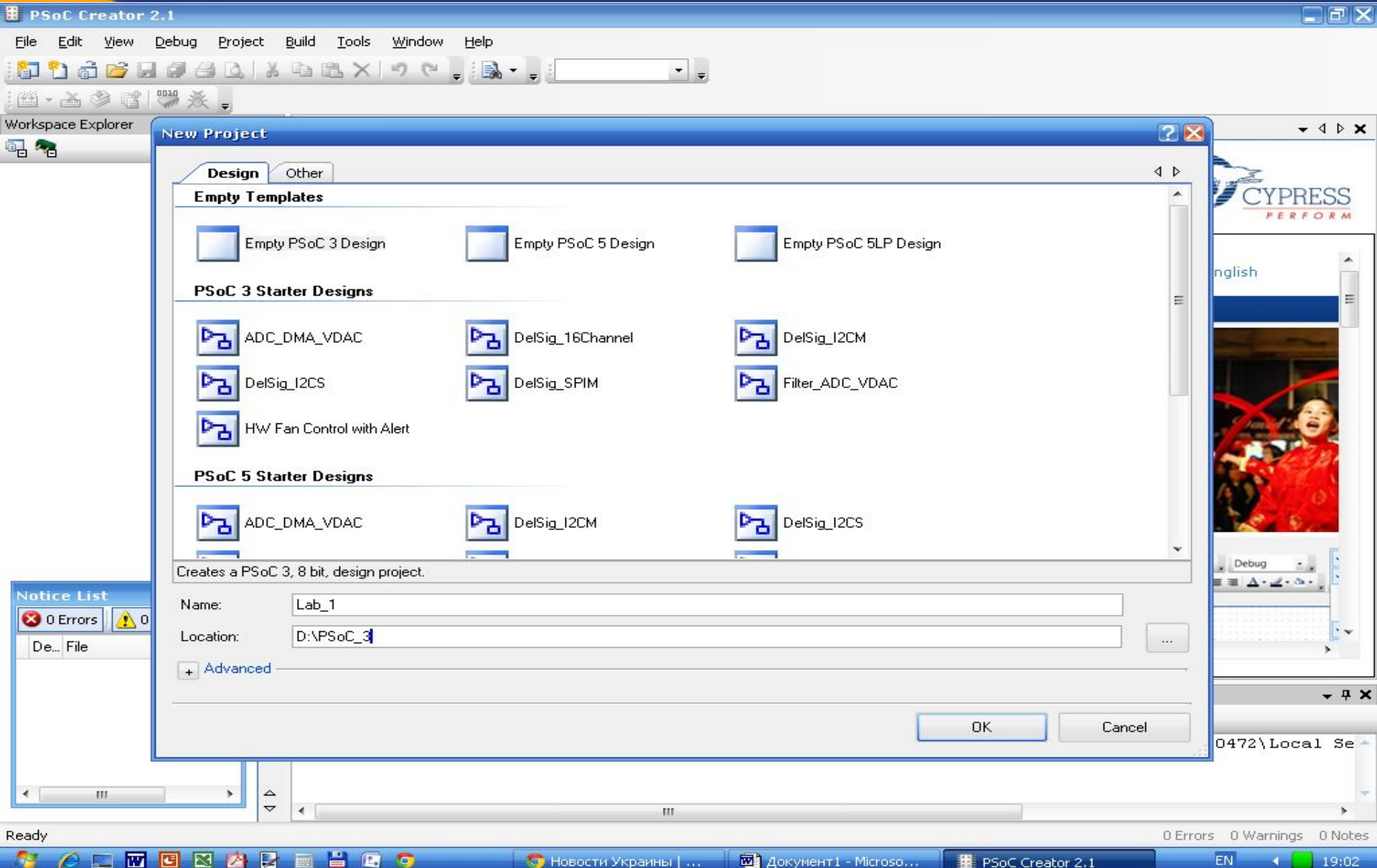
0 Errors 0 Warnings

De... File Error L

Output

Show output from: All

Log file for this session is located at: C:\Documents and Settings\Admin.MICROSOFT-7D0472\Local Se



The screenshot displays the PSoC Creator 2.1 application window. The main menu bar includes File, Edit, View, Debug, Project, Build, Tools, Window, and Help. The toolbar contains various icons for file operations and project management. The Workspace Explorer on the left shows a project structure. The central 'New Project' dialog box is open, showing a list of templates under the 'Design' tab. The 'Empty Templates' section includes 'Empty PSoC 3 Design', 'Empty PSoC 5 Design', and 'Empty PSoC 5LP Design'. The 'PSoC 3 Starter Designs' section includes 'ADC_DMA_VDAC', 'DelSig_16Channel', 'DelSig_I2CM', 'DelSig_I2CS', 'DelSig_SPIM', and 'Filter_ADC_VDAC'. The 'PSoC 5 Starter Designs' section includes 'ADC_DMA_VDAC', 'DelSig_I2CM', and 'DelSig_I2CS'. Below the templates, a description reads 'Creates a PSoC 3, 8 bit, design project.' The 'Name' field is set to 'Lab_1' and the 'Location' field is set to 'D:\PSoC_3'. The 'Advanced' section is expanded. The 'OK' and 'Cancel' buttons are visible at the bottom right of the dialog box. A 'Notice List' window is open in the bottom left corner, showing '0 Errors' and '0 Warnings'. The Windows taskbar at the bottom shows the system tray with '0 Errors', '0 Warnings', and '0 Notes', and the system clock showing '19:02'.

PSoC Creator 2.1

File Edit View Debug Project Build Tools Window Help

Workspace Explorer

New Project

Design Other

Empty Templates

- Empty PSoC 3 Design
- Empty PSoC 5 Design
- Empty PSoC 5LP Design

PSoC 3 Starter Designs

- ADC_DMA_VDAC
- DelSig_16Channel
- DelSig_I2CM
- DelSig_I2CS
- DelSig_SPIM
- Filter_ADC_VDAC
- HW Fan Control with Alert

PSoC 5 Starter Designs

- ADC_DMA_VDAC
- DelSig_I2CM
- DelSig_I2CS

Creates a PSoC 3, 8 bit, design project.

Name: Lab_1

Location: D:\PSoC_3

Advanced

OK Cancel

Notice List

0 Errors 0 Warnings

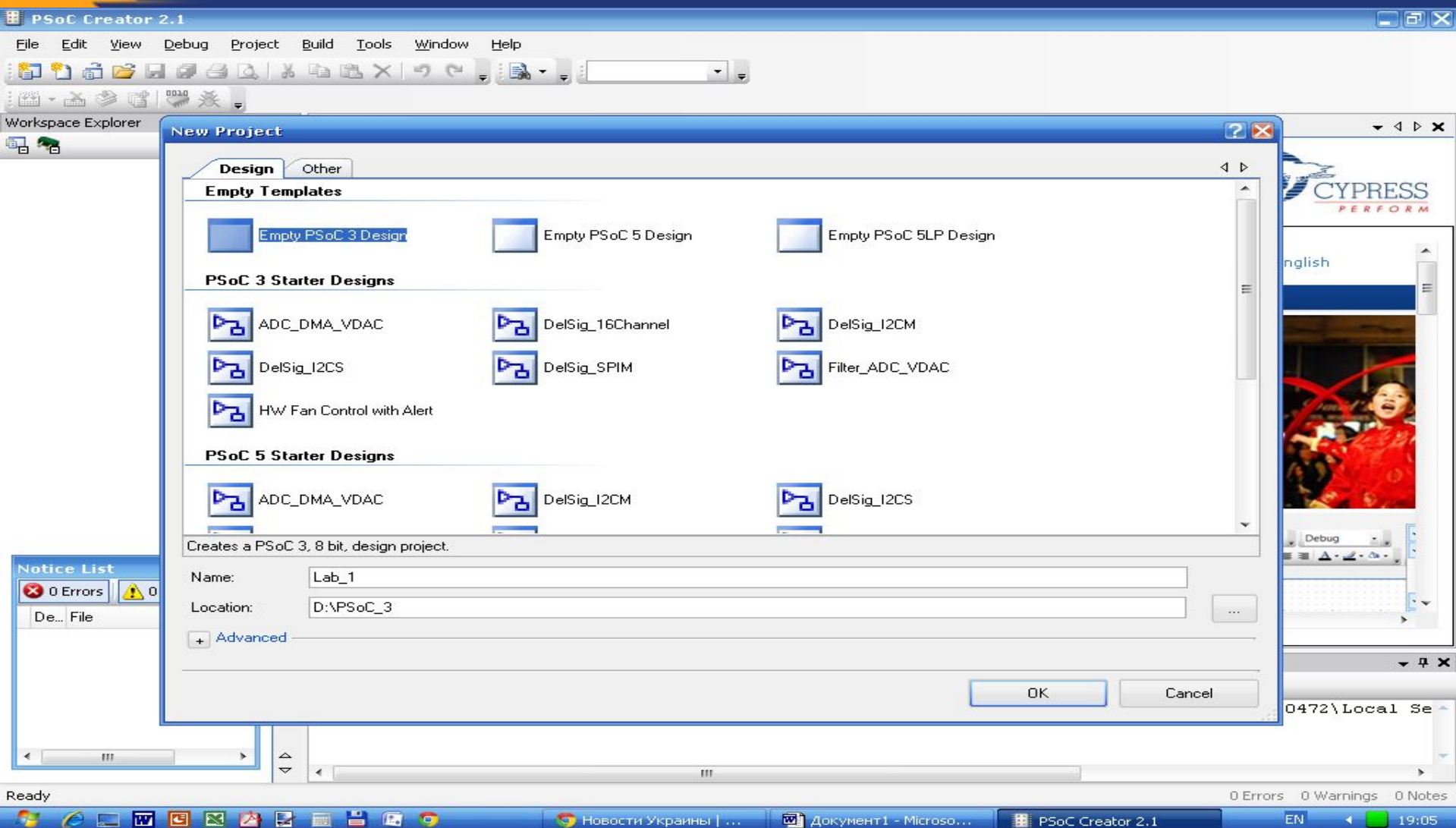
De... File

Ready

0 Errors 0 Warnings 0 Notes

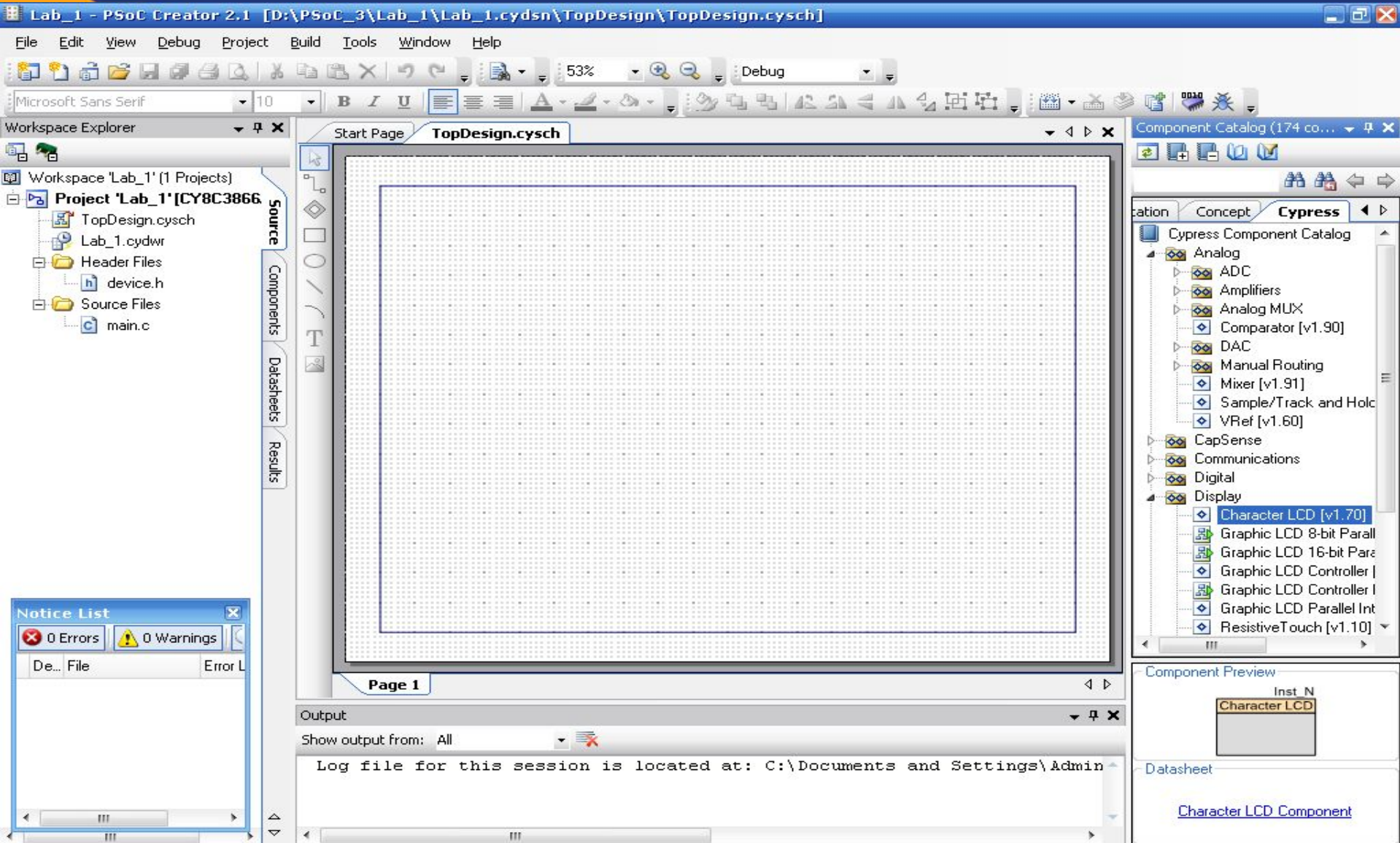
EN 19:02

Empty PSoC 3/5 Design



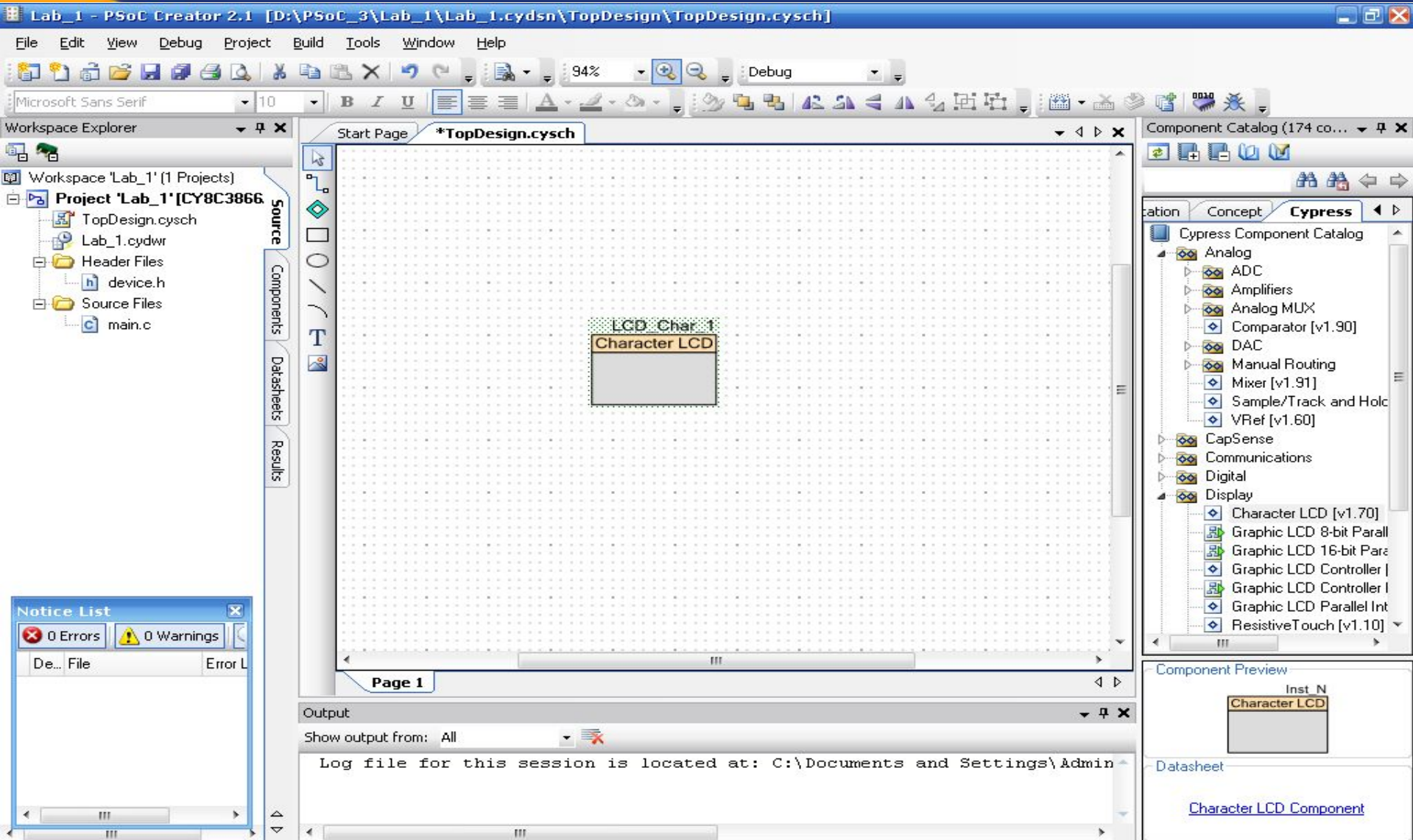
The screenshot displays the PSoC Creator 2.1 interface. The main window is titled 'PSoC Creator 2.1' and shows a menu bar (File, Edit, View, Debug, Project, Build, Tools, Window, Help) and a toolbar. The 'Workspace Explorer' is visible on the left. A 'New Project' dialog box is open in the center, with the 'Design' tab selected. The dialog lists 'Empty Templates' (Empty PSoC 3 Design, Empty PSoC 5 Design, Empty PSoC 5LP Design), 'PSoC 3 Starter Designs' (ADC_DMA_VDAC, DelSig_I2CS, HW Fan Control with Alert, DelSig_16Channel, DelSig_SPIM, Filter_ADC_VDAC), and 'PSoC 5 Starter Designs' (ADC_DMA_VDAC, DelSig_I2CM, DelSig_I2CS). Below the list, it states 'Creates a PSoC 3, 8 bit, design project.' The 'Name' field contains 'Lab_1' and the 'Location' field contains 'D:\PSoC_3'. There is an 'Advanced' button with a plus sign. At the bottom right of the dialog are 'OK' and 'Cancel' buttons. In the bottom left, a 'Notice List' shows '0 Errors' and '0 Warnings'. The Windows taskbar at the bottom shows the system tray with '0 Errors 0 Warnings 0 Notes', the language 'EN', and the time '19:05'. Open applications include 'Новости Украины', 'Документ1 - Micro...', and 'PSoC Creator 2.1'.

Custom Window



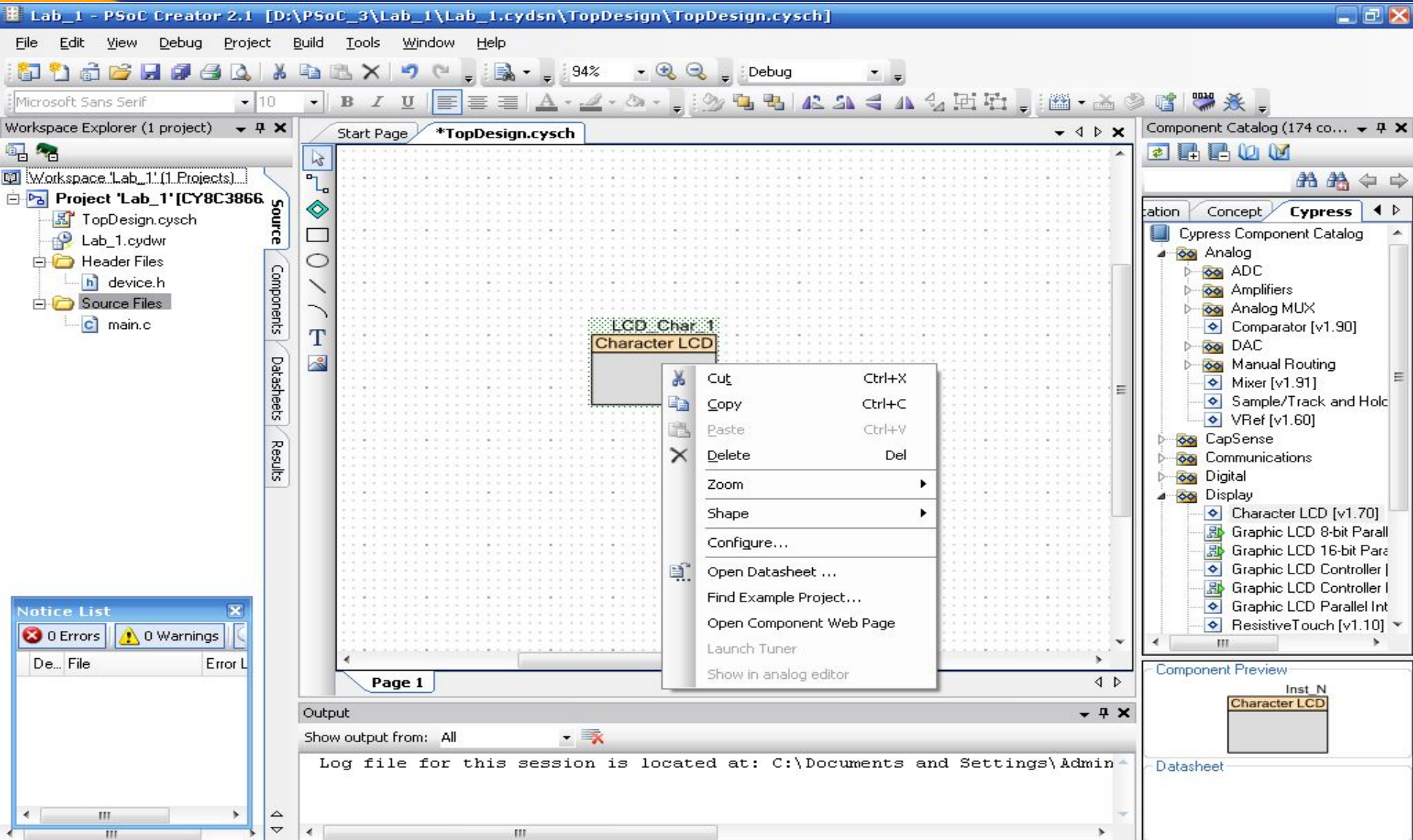
The screenshot displays the PSoC Creator 2.1 software interface. The main workspace is a grid-based design area for 'TopDesign.cysch'. The interface includes a menu bar (File, Edit, View, Debug, Project, Build, Tools, Window, Help), a toolbar, and a workspace explorer on the left showing the project structure. A 'Notice List' window is open in the bottom-left corner, showing 0 errors and 0 warnings. The 'Component Catalog' on the right lists various components, with 'Character LCD [v1.70]' selected. The 'Output' window at the bottom shows a log message: 'Log file for this session is located at: C:\Documents and Settings\Admin...'. The status bar at the bottom indicates 'Ready' and '0 Errors 0 Warnings 0 Notes'.

Character LCD



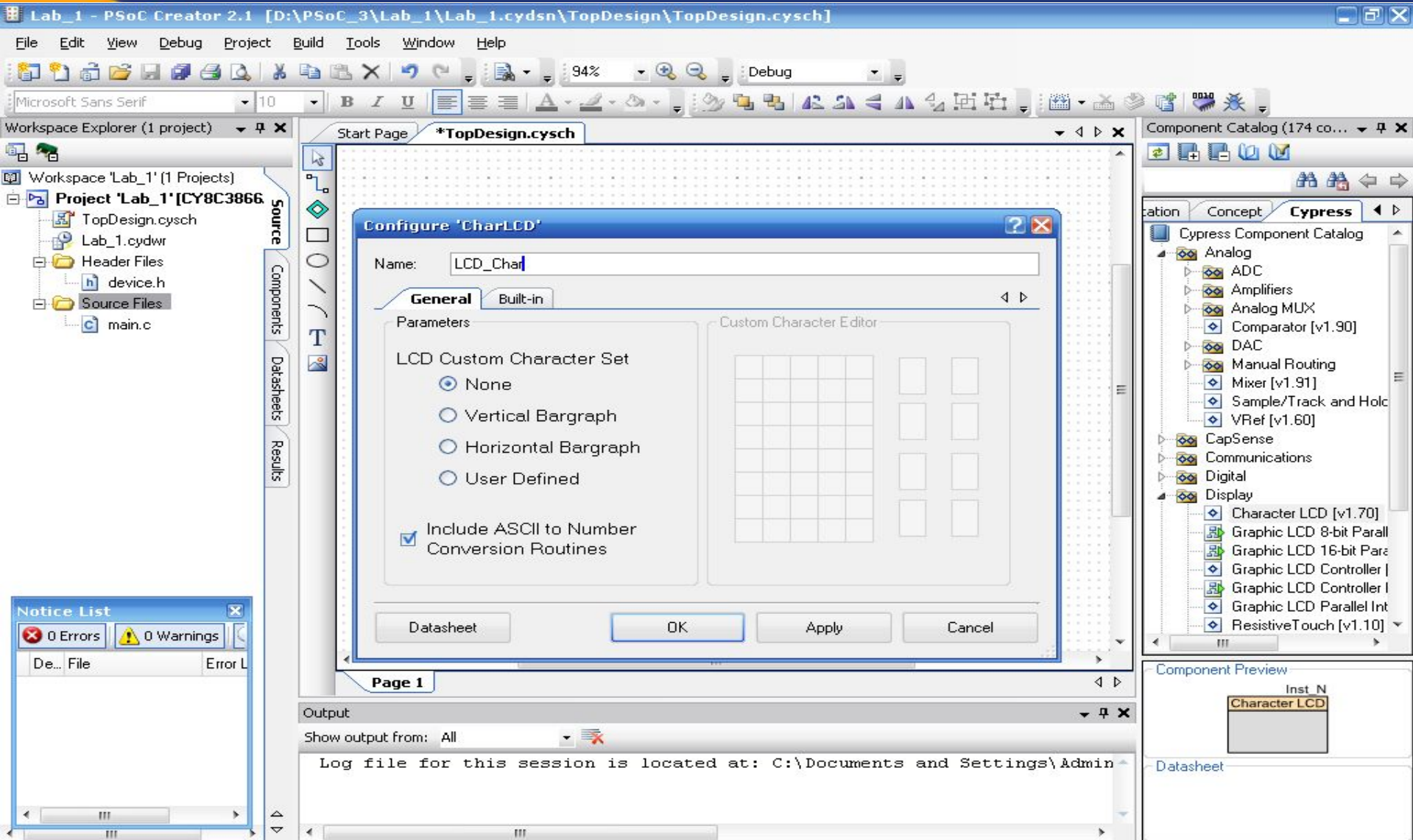
The screenshot displays the PSoC Creator 2.1 software interface. The main workspace shows a design page with a grid background. A component labeled "LCD Char 1" is being placed, and a smaller component labeled "Character LCD" is visible below it. The Component Catalog on the right lists various components, including "Character LCD [v1.70]". The Notice List window in the bottom left shows 0 Errors and 0 Warnings. The Output window at the bottom displays the message: "Log file for this session is located at: C:\Documents and Settings\Admin...".

Character LCD



The screenshot shows the PSoC Creator 2.1 IDE. The main workspace displays a schematic with a grid. A component labeled "Character LCD" is being placed on the grid. A context menu is open over the component, listing actions such as Cut, Copy, Paste, Delete, Zoom, Shape, Configure..., Open Datasheet..., Find Example Project..., Open Component Web Page, Launch Tuner, and Show in analog editor. The Component Catalog on the right shows the "Character LCD [v1.70]" component selected under the "Display" category. The Notice List in the bottom left shows 0 Errors and 0 Warnings. The Output window at the bottom displays the log file path: "Log file for this session is located at: C:\Documents and Settings\Admin...".

Configure LCD



Lab_1 - PSoC Creator 2.1 [D:\PSOC_3\Lab_1\Lab_1.cydsn\TopDesign\TopDesign.cysch]

File Edit View Debug Project Build Tools Window Help

Microsoft Sans Serif 10 B I U

Workspace Explorer (1 project)

Project 'Lab_1' (1 Projects)

- Project 'Lab_1' [CY8C3866]
 - TopDesign.cysch
 - Lab_1.cydwr
 - Header Files
 - device.h
 - Source Files
 - main.c

Start Page *TopDesign.cysch

Component Catalog (174 co...)

Character LCD [v1.70]

Character LCD [v1.70]

Graphic LCD 8-bit Paralle...

Graphic LCD 16-bit Paralle...

Graphic LCD Controller I...

Graphic LCD Controller I...

Graphic LCD Parallel Int...

Resistive Touch [v1.10]

Notice List

0 Errors 0 Warnings

De... File Error L

Output

Show output from: All

Log file for this session is located at: C:\Documents and Settings\Admin...

Page 1

Configure 'CharLCD'

Name: LCD_Char

General Built-in

Parameters Custom Character Editor

LCD Custom Character Set

- None
- Vertical Bargraph
- Horizontal Bargraph
- User Defined

Include ASCII to Number Conversion Routines

Datasheet OK Apply Cancel

Component Preview

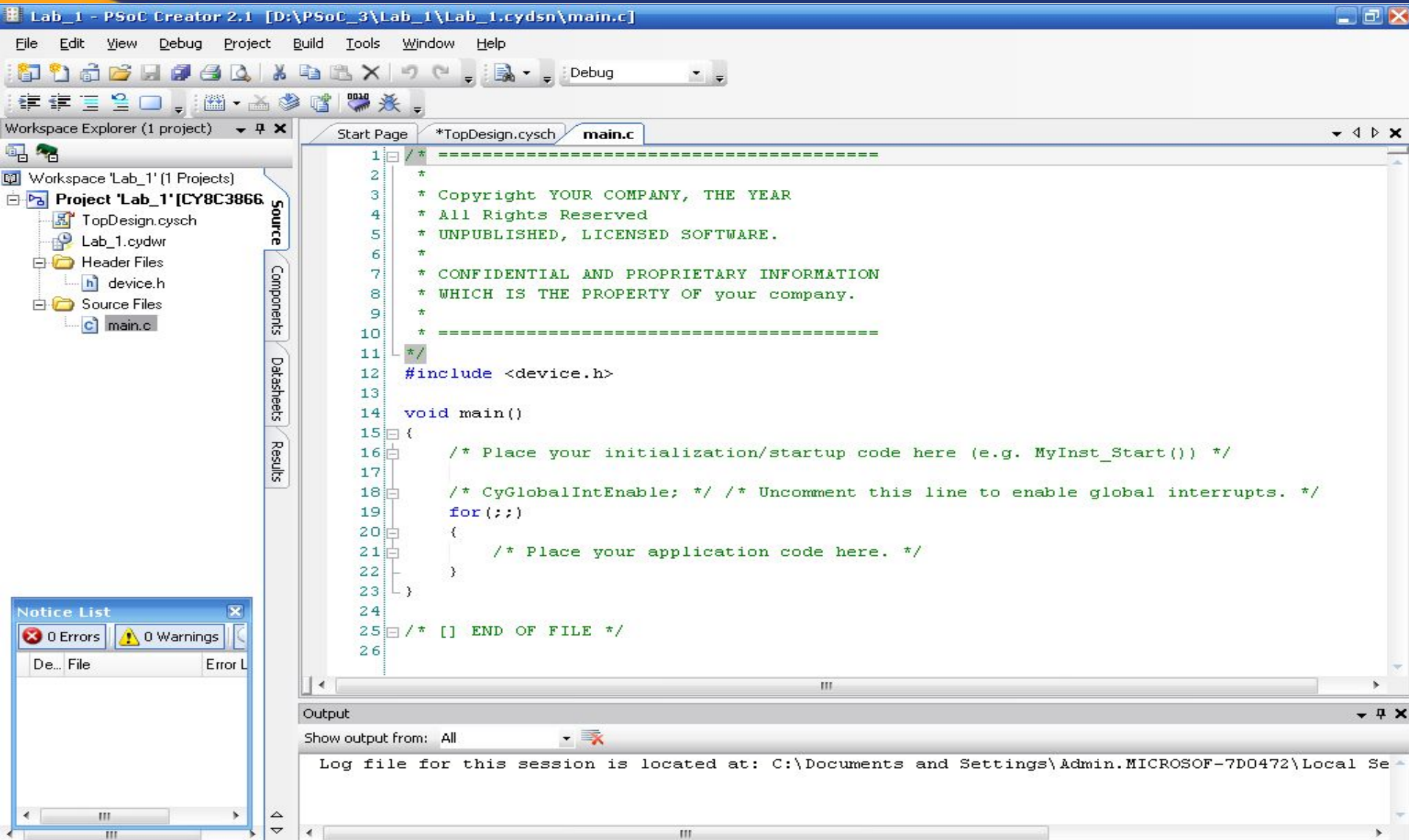
Inst N

Character LCD

Datasheet

Ready {X=295,Y=131} 0 Errors 0 Warnings 0 Notes

Новости Украины | ... Do_Present_1.doc - ... PSoC Creator 2.1 EN 19:25



Lab_1 - PSoC Creator 2.1 [D:\PSoC_3\Lab_1\Lab_1.cydsn\main.c]

File Edit View Debug Project Build Tools Window Help

Debug

Workspace Explorer (1 project)

Project 'Lab_1' [CY8C3866]

- TopDesign.cysch
- Lab_1.cydwr
- Header Files
- device.h
- Source Files
- main.c

```
1  /* -----  
2  *  
3  * Copyright YOUR COMPANY, THE YEAR  
4  * All Rights Reserved  
5  * UNPUBLISHED, LICENSED SOFTWARE.  
6  *  
7  * CONFIDENTIAL AND PROPRIETARY INFORMATION  
8  * WHICH IS THE PROPERTY OF your company.  
9  *  
10 * -----  
11 */  
12 #include <device.h>  
13  
14 void main()  
15 {  
16     /* Place your initialization/startup code here (e.g. MyInst_Start()) */  
17  
18     /* CyGlobalIntEnable; */ /* Uncomment this line to enable global interrupts. */  
19     for (;;)   
20     {  
21         /* Place your application code here. */  
22     }  
23 }  
24  
25 /* [] END OF FILE */  
26
```

Notice List

0 Errors 0 Warnings

De...	File	Error L
-------	------	---------

Output

Show output from: All

Log file for this session is located at: C:\Documents and Settings\Admin.MICROSOFT-7D0472\Local Se

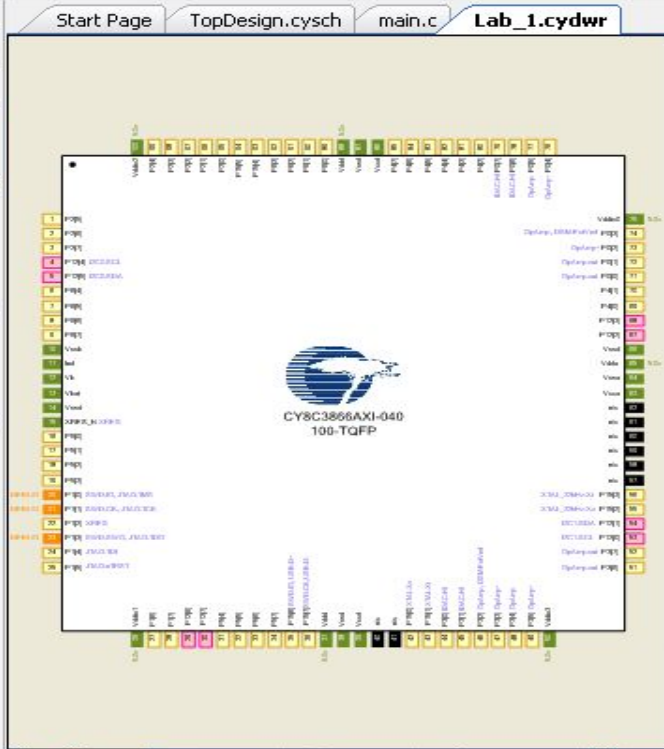
Ln 1 Col 1 INS 0 Errors 0 Warnings 0 Notes

Lab_1 - PSoC Creator 2.1 [D:\PSoC_3\Lab_1\Lab_1.cydsn\Lab_1.cydw] 37% Debug

File Edit View Debug Project Build Tools Window Help

Workspace Explorer (1 project)

- Workspace 'Lab_1' (1 Projects)
 - Project 'Lab_1' [CY8C3866]
 - TopDesign.cysch
 - Lab_1.cydw
 - Header Files
 - device.h
 - Source Files
 - main.c



Alias	Name	Port	Pin	Lock
	\LCD_Char:LCDPort[6:0]\			
		P0[6:0]	IDAC:HC	
		P0[7:1]	IDAC:HC	
		P2[6:0]		
		P2[7:1]		
		P3[6:0]	OpAmp:c	
		P3[7:1]	OpAmp:c	
		P4[6:0]		
		P4[7:1]		
		P5[6:0]		

LCD_Char_LCDPort_6 - Digital
LCD_Char_LCDPort_5 - Digital
LCD_Char_LCDPort_4 - Digital

Notice List

0 Errors 0 Warnings

De... File Error L

Pins Analog Clocks Interrupts DMA System Directives Flash Security

Output

Show output from: All

Log file for this session is located at: C:\Documents and Settings\Admin.MICROSOFT-7D0472\Local Se



Build – Debug - Program

The screenshot shows the PSoC Creator 2.1 IDE interface. The main window displays the source code for `main.c`. The code includes a copyright notice and a `main()` function. The build output window at the bottom shows the following message:

```
SRAM used: 93 of 8192 bytes (1.1%).  
----- Build Succeeded: 02/14/2013 19:39:40 -----
```

The Workspace Explorer on the left shows the project structure for `Project 'Lab_1' [CY8C3]`, including source files like `device.h`, `main.c`, and various system files under `Generated_Source` and `PSoC3`.



LCD Custom Character Set

Lab_1 - PSoC Creator 2.1 [D:\PSoC_3\Lab_1\Lab_1.cydsn\TopDesign\TopDesign.cysch]

File Edit View Debug Project Build Tools Window Help

Microsoft Sans Serif 10 B I U

Workspace Explorer

Project 'Lab_1' [CY8C3866AX-040]

Source Components Datasheets Results

Configure 'CharLCD'

Name: LCD_Char

General Built-in

Parameters

LCD Custom Character Set

- None
- Vertical Bargraph
- Horizontal Bargraph
- User Defined

Include ASCII to Number Conversion Routines

Custom Character Editor

Custom 7

Datasheet OK Apply Cancel

Page 1

Output

Show output from: All

```
Verify Checksum...
Device 'PSoC 3 CY8C3866AX*-040' was successfully programmed at 02/14/2011
```

Notice List

0 Errors 0 Warnings

Component Catalog (174 components)

Cypress Component Catalog

- Analog
 - ADC
 - Amplifiers
 - Analog MUX
 - Comparator [v1.90]
 - DAC
 - Manual Routing
 - Mixer [v1.91]
 - Sample/Track and Hold
 - VRef [v1.60]
- CapSense
- Communications
- Digital
 - Character LCD [v1.70]
 - Graphic LCD 8-bit Parallel
 - Graphic LCD 16-bit Parallel
 - Graphic LCD Controller I
 - Graphic LCD Controller II
 - Graphic LCD Parallel Interface
 - Resistive Touch [v1.10]

Component Preview

Inst N

Character LCD

Datasheet

Ready {X=442,Y=450} 0 Errors 0 Warnings 0 Notes



Open Project/Workspace

The screenshot shows the PSoC Creator 2.1 application window. The 'File' menu is open, and the 'Open' option is selected. A sub-menu is visible, showing 'Project/Workspace', 'File... Ctrl+O', and 'Example Project...'. The main workspace contains a 'Recent Projects' list with items like 'CharLCD_CustomFont01.c...', 'Lab_1.cywrk', and 'HelloWorld_Blinky01.cywrk'. There are also sections for 'Getting Started' and 'Examples and Kits'. A 'Notice List' window is open in the bottom left, showing '0 Errors' and '0 Warnings'. The 'Output' window at the bottom shows a log message: 'Log file for this session is located at: C:\Documents and Settings\Admin.MICROSOFT-7D0472\Local Se...'. The status bar at the bottom right shows '0 Errors 0 Warnings 0 Notes'.



Lab_1 Character LCD

The screenshot shows the PSoC Creator 2.1 IDE interface. The main workspace displays a grid with a component labeled "LCD" and "Character LCD" placed on it. The Component Catalog on the right shows the "Character LCD [v1.70]" component selected under the "Display" category. The Workspace Explorer on the left shows the project structure, including "Header Files", "Source Files", and "Generated_Source". The Output window at the bottom shows the message: "Log file for this session is located at: C:\Documents and Settings\Admin...". A "Notice List" window is also visible in the bottom-left corner, showing "0 Errors" and "0 Warnings".



Lab_1 Character LCD

CharLCD_CustomFont01 - PSoC Creator 2.1 [F:\LCD_Font_1\CharLCD_CustomFont01\CharLCD_CustomFont01.cydsn\main.c]

File Edit View Debug Project Build Tools Window Help

Debug

Workspace Explorer (1 project)

- Project 'CharLCD_CustomFont01'
 - TopDesign.cysch
 - CharLCD_CustomFont01
 - Header Files
 - device.h
 - Source Files
 - main.c
 - Generated_Source
 - PSoC3
 - cy_boot
 - CyBootAsmk
 - CyDmac.c
 - CyDmac.h
 - CyFlash.c
 - CyFlash.h
 - CyLib.c
 - CyLib.h
 - cymem.a51
 - cypins.h

Source Components Datasheets Results

```
1 /*****  
2 * File Name: main.c  
3 *  
4 * Version: 2.0  
5 *  
6 * Description:  
7 * The example project displays " CYPRESS" in a custom font on 2X16 LCD  
8 * available with CY8CKIT-001.  
9 *  
10 *****/  
11 * Copyright 2012, Cypress Semiconductor Corporation. All rights reserved.  
12 * This software is owned by Cypress Semiconductor Corporation and is protected  
13 * by and subject to worldwide patent and copyright laws and treaties.  
14 * Therefore, you may use this software only as provided in the license agreement  
15 * accompanying the software package from which you obtained this software.  
16 * CYPRESS AND ITS SUPPLIERS MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED,  
17 * WITH REGARD TO THIS SOFTWARE, INCLUDING, BUT NOT LIMITED TO, NONINFRINGEMENT,  
18 * IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.  
19 *****/  
20  
21 #include <device.h>  
22  
23 extern uint8 const CYCODE LCD_customFonts[];  
24  
25 /*****  
26 * Function Name: main  
27 *****/
```

Notice List

0 Errors 0 Warnings

De... File Error L

Output

Show output from: All

Log file for this session is located at: C:\Documents and Settings\Admin.MICROSOFT-7D0472\Local Se



Lab_1 Character LCD

CharLCD_CustomFont01 - PSoC Creator 2.1 [F:\LCD_Font_1\CharLCD_CustomFont01\CharLCD_CustomFont01.cydsn\main.c]

File Edit View Debug Project Build Tools Window Help

Debug

Workspace Explorer (1 project)

Project 'CharLCD_CustomFont01'

- TopDesign.cysch
- CharLCD_CustomFont01
 - Header Files
 - device.h
 - Source Files
 - main.c
 - Generated_Source
 - PSoC3
 - cy_boot
 - CyBootAsmk
 - CyDmac.c
 - CyDmac.h
 - CyFlash.c
 - CyFlash.h
 - CyLib.c
 - CyLib.h
 - cymem.a51
 - cypins.h

```
25 /*****  
26 * Function Name: main  
27 *****/  
28 *  
29 * Summary:  
30 * The main program does the following  
31 * 1. Initialiaes the LCD.  
32 * 2. Load the custom fonts.  
33 * 3. Puts "CYPRESS" in custom available font on the row 0 of the LCD.  
34 * 4. Prints " Perform" in normal font on the row 1 of the LCD.  
35 *  
36 * Parameters:  
37 * None.  
38 *  
39 * Return:  
40 * None.  
41 *  
42 *****/  
43 void main()  
44 {  
45     uint8 pos = 1u;  
46     uint8 row = 0u;  
47  
48     LCD_Start();  
49     LCD_LoadCustomFonts(LCD_customFonts);  
50 }
```

Notice List

0 Errors 0 Warnings

De... File Error L

Output

Show output from: All

Log file for this session is located at: C:\Documents and Settings\Admin.MICROSOFT-7D0472\Local Se



Lab_1 Character LCD

CharLCD_CustomFont01 - PSoC Creator 2.1 [F:\LCD_Font_1\CharLCD_CustomFont01\CharLCD_CustomFont01.cydsn\main.c]

File Edit View Debug Project Build Tools Window Help

Debug

Workspace Explorer (1 project)

- Workspace 'CharLCD_CustomFont01'
 - Project 'CharLCD_CustomFont01'
 - TopDesign.cysch
 - CharLCD_CustomFont01
 - Header Files
 - device.h
 - Source Files
 - main.c
 - Generated_Source
 - PSoC3
 - cy_boot
 - CyBootAsmk
 - CyDmac.c
 - CyDmac.h
 - CyFlash.c
 - CyFlash.h
 - CyLib.c
 - CyLib.h
 - cymem.a51
 - cypins.h

Source Components Datasheets Results

```
50
51 LCD_Position(row, pos);
52 LCD_PutChar(LCD_CUSTOM_0);
53 pos += 1u;
54
55 LCD_Position(row, pos);
56 LCD_PutChar(LCD_CUSTOM_1);
57 pos += 1u;
58
59 LCD_Position(row, pos);
60 LCD_PutChar(LCD_CUSTOM_2);
61 pos += 1u;
62
63 LCD_Position(row, pos);
64 LCD_PutChar(LCD_CUSTOM_3);
65 pos += 1u;
66
67 LCD_Position(row, pos);
68 LCD_PutChar(LCD_CUSTOM_4);
69 pos += 1u;
70
71 LCD_Position(row, pos);
72 LCD_PutChar(LCD_CUSTOM_5);
73 pos += 1u;
74
75 LCD_Position(row, pos);
76 LCD_PutChar(LCD_CUSTOM_6);
77 pos += 1u;
```

Output

Show output from: All

Log file for this session is located at: C:\Documents and Settings\Admin.MICROSOFT-7D0472\Local Se

Notice List

0 Errors 0 Warnings

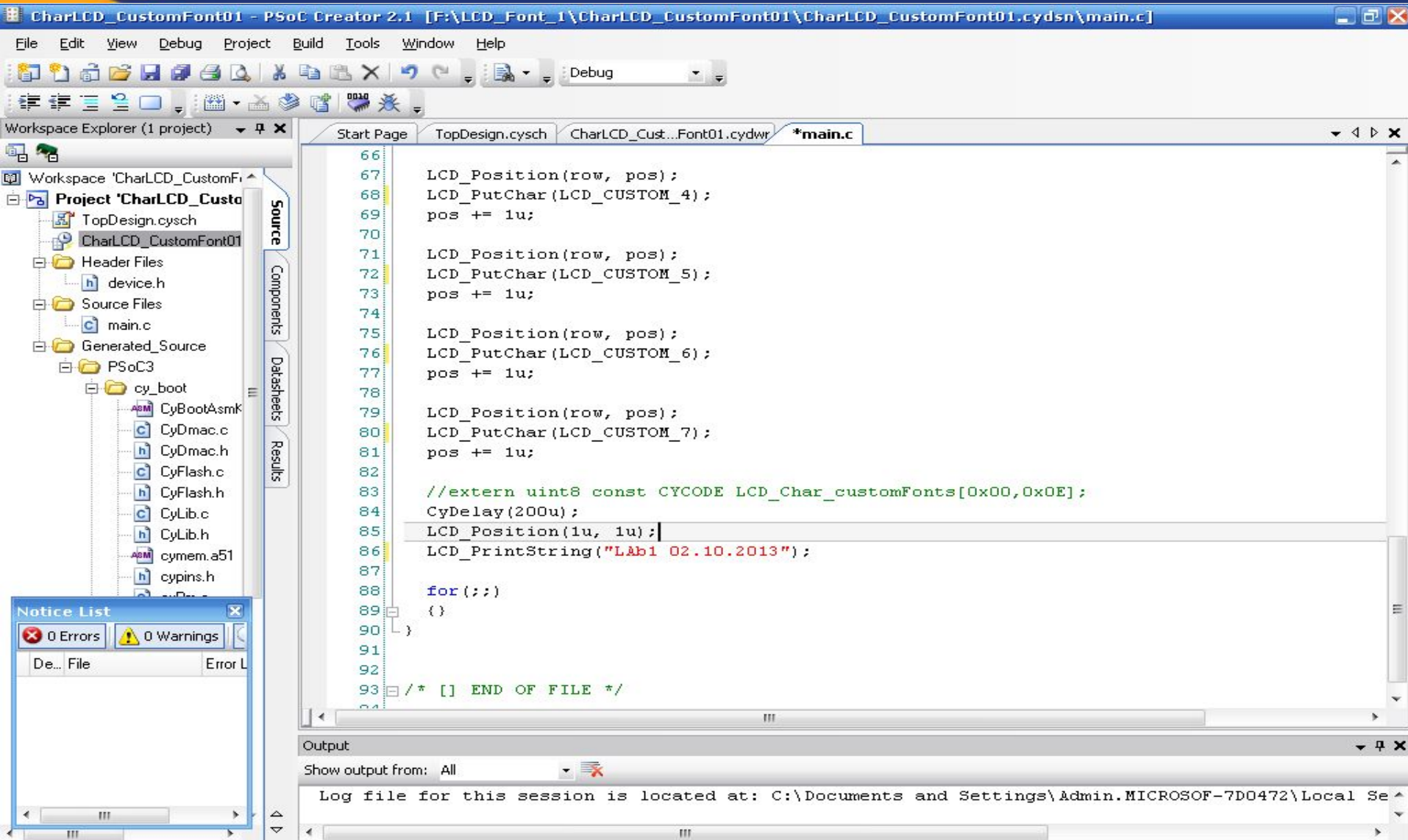
De...	File	Error L
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Ready

Ln 76 Col 37 INS 0 Errors 0 Warnings 0 Notes

Новости ... Do_Prese... Microsoft ... CharLCD... EN 7:43

Lab_1 Character LCD



The screenshot shows the PSoC Creator 2.1 IDE with the following components:

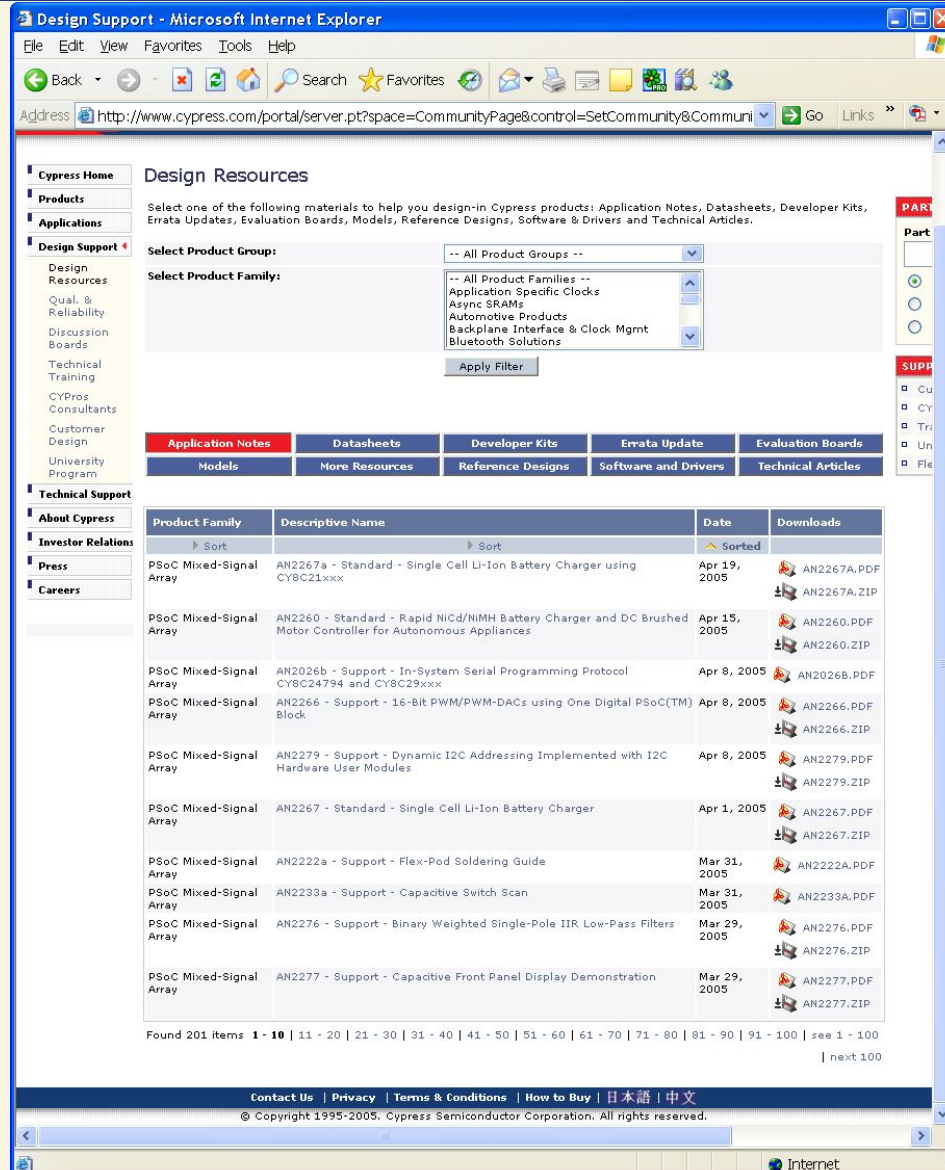
- Workspace Explorer:** Shows the project structure for 'CharLCD_CustomFont01', including source files like 'main.c' and 'device.h'.
- Source Editor:** Displays the C code in 'main.c' with the following content:


```

66
67     LCD_Position(row, pos);
68     LCD_PutChar(LCD_CUSTOM_4);
69     pos += 1u;
70
71     LCD_Position(row, pos);
72     LCD_PutChar(LCD_CUSTOM_5);
73     pos += 1u;
74
75     LCD_Position(row, pos);
76     LCD_PutChar(LCD_CUSTOM_6);
77     pos += 1u;
78
79     LCD_Position(row, pos);
80     LCD_PutChar(LCD_CUSTOM_7);
81     pos += 1u;
82
83     //extern uint8 const CYCODE LCD_Char_customFonts[0x00,0x0E];
84     CyDelay(200u);
85     LCD_Position(1u, 1u);
86     LCD_PrintString("L&ab1 02.10.2013");
87
88     for (;;)
89     {}
90 }
91
92
93 /* [] END OF FILE */

```
- Notice List:** Shows '0 Errors' and '0 Warnings'.
- Output Window:** Displays the message: 'Log file for this session is located at: C:\Documents and Settings\Admin.MICROSOFT-7D0472\Local Se...'.

На сайті фірми Cypress знаходиться більше **200** Application Notes і Reference Designs, які ілюструють області застосування мікроконтролерів PSoC.



The screenshot shows the 'Design Resources' page on the Cypress website. It features a navigation menu on the left, a search and filter section at the top, and a table of application notes below. The table lists various product families and their corresponding application notes, including dates and download links.

Product Family	Descriptive Name	Date	Downloads
PSoC Mixed-Signal Array	AN2267a - Standard - Single Cell Li-Ion Battery Charger using CY8C21xxx	Apr 19, 2005	AN2267A.PDF AN2267A.ZIP
PSoC Mixed-Signal Array	AN2260 - Standard - Rapid NiCd/NiMH Battery Charger and DC Brushed Motor Controller for Autonomous Appliances	Apr 15, 2005	AN2260.PDF AN2260.ZIP
PSoC Mixed-Signal Array	AN2026b - Support - In-System Serial Programming Protocol CY8C24794 and CY8C29xxx	Apr 8, 2005	AN2026B.PDF
PSoC Mixed-Signal Array	AN2266 - Support - 16-Bit PWM/PWM-DACs using One Digital PSoC(TM) Block	Apr 8, 2005	AN2266.PDF AN2266.ZIP
PSoC Mixed-Signal Array	AN2279 - Support - Dynamic I2C Addressing Implemented with I2C Hardware User Modules	Apr 8, 2005	AN2279.PDF AN2279.ZIP
PSoC Mixed-Signal Array	AN2267 - Standard - Single Cell Li-Ion Battery Charger	Apr 1, 2005	AN2267.PDF AN2267.ZIP
PSoC Mixed-Signal Array	AN2222a - Support - Flex-Pod Soldering Guide	Mar 31, 2005	AN2222A.PDF
PSoC Mixed-Signal Array	AN2233a - Support - Capacitive Switch Scan	Mar 31, 2005	AN2233A.PDF
PSoC Mixed-Signal Array	AN2276 - Support - Binary Weighted Single-Pole IIR Low-Pass Filters	Mar 29, 2005	AN2276.PDF AN2276.ZIP
PSoC Mixed-Signal Array	AN2277 - Support - Capacitive Front Panel Display Demonstration	Mar 29, 2005	AN2277.PDF AN2277.ZIP

Found 201 items 1 - 10 | 11 - 20 | 21 - 30 | 31 - 40 | 41 - 50 | 51 - 60 | 61 - 70 | 71 - 80 | 81 - 90 | 91 - 100 | see 1 - 100 | next 100

Мікропроцесорна техніка

(лекція 1, кінець)
Благітко Б.Я.
2019 р.

