

Opamp_P4 example project

1.1

Features:

- General purpose signal amplifier

General Description

This example project demonstrates the functionality of the Opamp as the/a general purpose signal amplifier.

Development kit configuration

This example project is designed to run on the CY8CKIT-042 kit from Cypress Semiconductor. A description of the kit, along with more example programs and ordering information, can be found at <http://www.cypress.com/go/cy8ckit-042>.

The project requires configuration settings changes to run on other kits from Cypress Semiconductor. Table 1 is the list of the supported kits. To switch from CY8CKIT-042 to any other kit, change the project's device with the help of Device Selector called from the project's context menu.

Table 1. Development Kits vs Parts

| Development Kit | Device |
|-----------------|-------------------|
| CY8CKIT-042 | CY8C4245AXI-483 |
| CY8CKIT-042-BLE | CY8C4247LQI-BL483 |
| CY8CKIT-044 | CY8C4247AZI-M485 |
| CY8CKIT-046 | CY8C4248BZI-L489 |
| CY8CKIT-041 | CY8C4146AZI-S433 |

The pin assignments for the supported kits are in Table 2.

Table 2. Pin Assignment

| Pin Name | Development Kit | | | | |
|----------|-----------------|-----------------|-------------|-------------|-------------|
| | CY8CKIT-042 | CY8CKIT-042 BLE | CY8CKIT-044 | CY8CKIT-046 | CY8CKIT-041 |
| Vminus | P1[1] | P1[1] | P1[1] | P1[1] | P1[1] |
| Vplus | P1[0] | P1[0] | P1[0] | P1[0] | P1[0] |
| Vout | P1[2] | P1[2] | P1[2] | P1[2] | P1[2] |

The following steps should be performed to observe the project's operation:

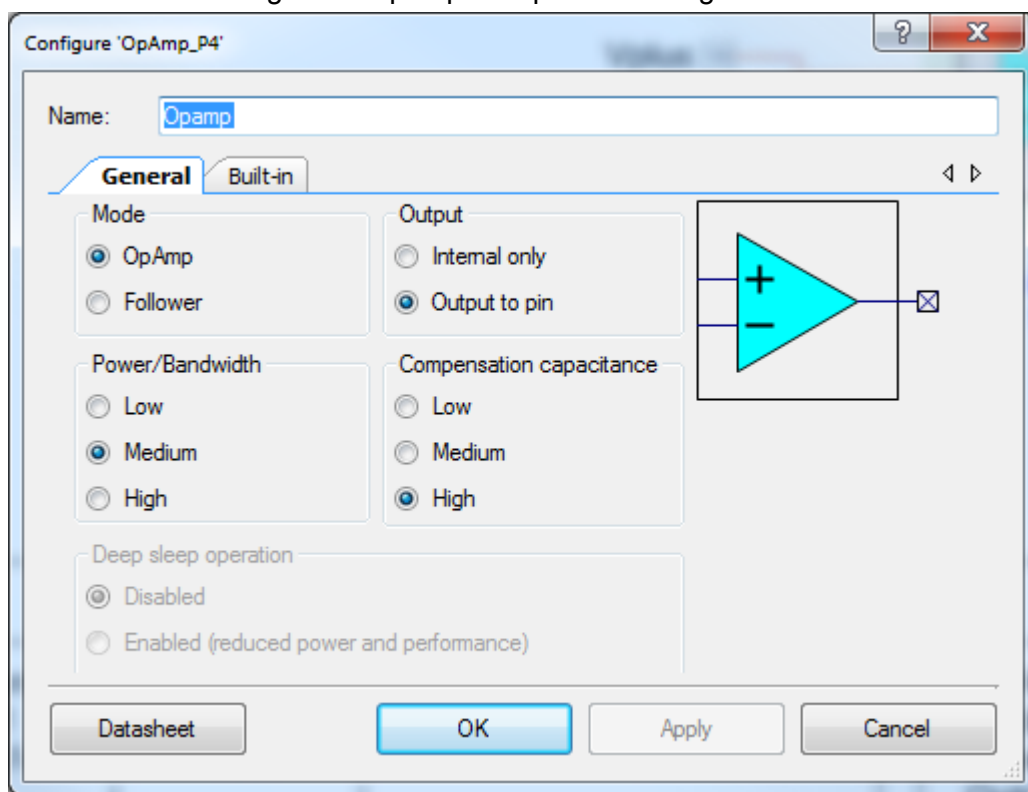
1. Connect a Rf resistor between the Vminus and Vout pins.
2. Connect a R1 resistor between Vminus pin and GND.

3. Connect the input voltage (V_{in}) source (e.g. 0.5V) to the Vplus pin.
4. Build the project and program the hex file on to the target device.
5. Power cycle the device and observe the voltage level (1V) on Vout pin using a multimeter, refer to the Expected result section for more information.

Project configuration

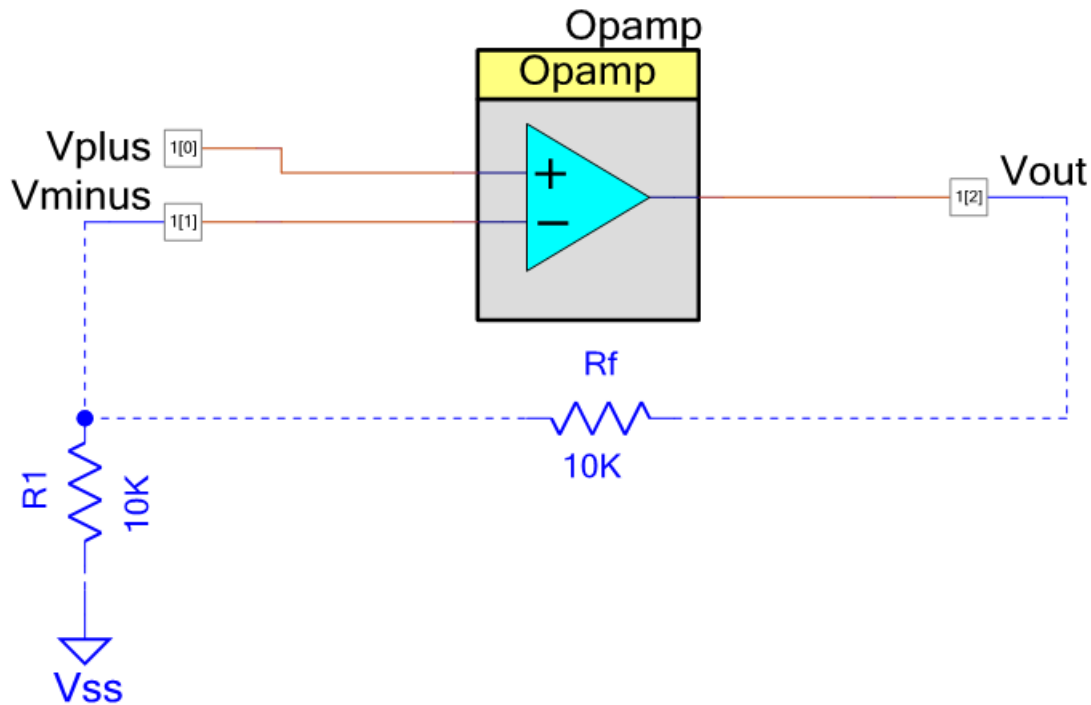
The example project consists of the analog pins and Opamp Components. The Opamp component configuration is shown in Figure 1.

Figure 1. Opamp Component Configuration



The top design schematic is shown in Figure 2.

Figure 2. Top Design Schematic



Expected results

The Opamp component works as an amplifier with the next gain: $\text{Gain} = 1 + R_f/R_1$. The output voltage is $V_{out} = V_{in} * \text{Gain}$. In our case $R_f = R_1 = 10k$, so $\text{Gain} = 2$ and the observed output voltage should be twice bigger than the input voltage. For example if $V_{in} = 0.5V$, then $V_{out} = 1V$.

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