Analog Buffer (ABuf)
1.0

Deprecation of ABuf

The Analog Buffer (ABuf) component and its associated data sheet have been deprecated and replaced by the OpAmp component and data sheet. This was due to a renaming of the silicon abuf to opamp and the desire to be consistent in the hardware and software.

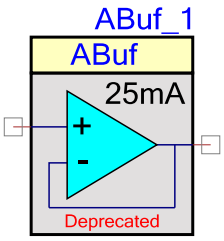
The ABuf component remains in the Component Catalog to support legacy designs; however, it will be hidden by default for new designs, and it has been moved to a "deprecated" folder.

You should update your designs that use the ABuf component to use the OpAmp component. To replace the component:

- Delete the ABuf from your design.
- Place an OpAmp at the deleted ABuf location.
- Configure the OpAmp component the same as the ABuf.

Features

- 25 mA output current
- Follower or OpAmp configuration
- Low resistance connection from output to pin



General Description

The Analog Buffer (ABuf) component provides a simple follower or basic OpAmp configuration. The inputs and output may be connected to internal routing nodes, directly to pins, or a combination of internal and external signals.

When to use an ABuf

The ABuf should be used anytime a voltage output needs to drive a load of less than 10K Ohms. These buffers can also be used as stand-alone amplifiers. The Abuf may be used as a generic OpAmp with external components.

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Input/Output Connections

This section describes the various input and output connections for the ABuf. An asterisk (*) in the list of I/O's states that the I/O may be hidden on the symbol under the conditions listed in the description of that I/O.

Non-Inverting – Analog

When the ABuf is configured as a follower, this in the voltage input. If the ABuf is configured as an OpAmp, it acts as the standard OpAmp non-inverting input.

Inverting – Analog *

When the ABuf is configured for the follower mode, this pin is unavailable to the user. When the ABuf is configured as an OpAmp, this pin is the standard Inverting pin of a basic OpAmp.

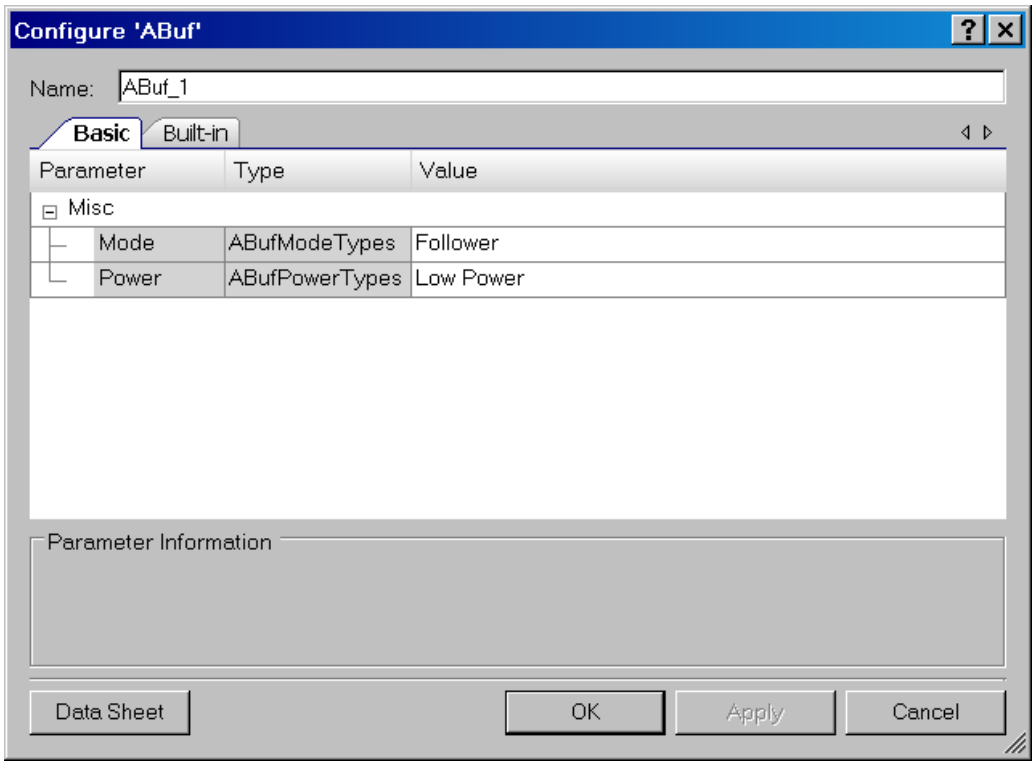
Vout – Analog

This is the standard OpAmp output signal. It is directly connected to a pin and is capable of driving 25mA.

Parameters and Setup

Drag an ABuf component onto your design and double-click it to open the Configure dialog.

Figure 1 Configure ABuf Dialog

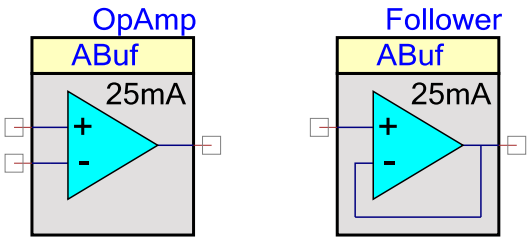


The ABuf has the following parameters:

Mode

This parameter allows you to select between two configurations: “OpAmp” and “Follower”. In OpAmp mode, all three terminals are available for connection. In Follower mode, the inverting input is internally connected to the output to create a voltage follower. The follower is the default configuration.

Figure 2 Configuration Options



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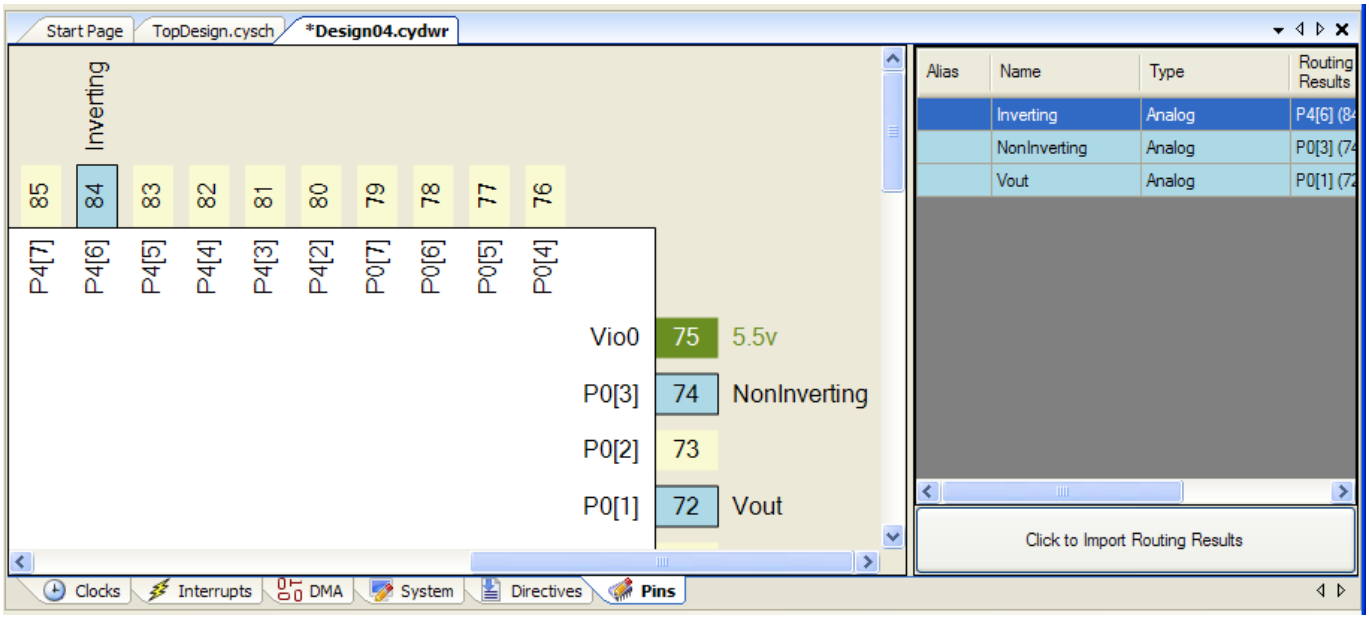
Power

This parameter allows you to select the power level of high, medium or low to adjust the OpAmp to different external loads.

Placement

Each Analog buffer is directly associated with a set of GPIO pins. See the data sheet for the part being used for the specific pin connections. The following shows one example of how the buffer may be connected using the Design-Wide Resources Pin Editor.

Figure 3 Example placement



Resources

The ABuf component uses one Abuf resource per instance. When used in the OpAmp mode with external components (i.e., not routing the output through the analog globals), no routing resources are used.

Application Programming Interface

Application Programming Interface (API) routines allow you to configure the component using software. The following table lists and describes the interface to each function. The subsequent sections cover each function in more detail.

By default, PSoC Creator assigns the instance name "ABuf_1" to the first instance of a component in a given design. You can the rename it to any unique value that follows the

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syntactic rules for identifiers. The instance name becomes the prefix of every global function name, variable, and constant symbol. For readability, the instance name used in the following table is "ABuf".

Function	Description
void ABuf_Start(void)	Enable Analog Buffer.
void ABuf_Stop(void)	Disable Analog Buffer (power down)
void ABuf_SetPower(uint8 power)	Set the power level.

void ABuf_Start(void)

Description: Turns on the Analog Buffer and sets the power level to the value chosen during the parameter selection.

Parameters: None

Return Value: None

Side Effects: None

void ABuf_Stop(void)

Description: Turn off the Analog Buffer and enable its lowest power state.

Parameters: None

Return Value: None

Side Effects: None

void ABuf_SetPower(uint8 power)

Description: Sets the power level.

Parameters: (uint8) power: Sets the power level to one of three settings, Low, Medium, or High.

Power Setting	Notes
ABuf_LOWPOWER	Uses least amount of power
ABuf_MEDPOWER	
ABuf_HIGHPOWER	Uses most amount of power

Return Value: None

Side Effects: None

Sample Firmware Source Code

The following is a C language example demonstrating the basic functionality of the ABuf component. This example assumes the component has been placed in a design with the default name "ABuf_1."

Note If you rename your component you must also edit the example code as appropriate to match the component name you specify.

```
#include <device.h>

void main()
{
    ABuf_1_Start();

}
```

DC and AC Electrical Characteristics

5.0V/3.3V DC and AC Electrical Characteristics

Parameter	Typical	Min	Max	Units	Conditions and Notes
Input					
Input Voltage Range	---		Vss to Vdd	V	
Input Offset Voltage	---		---	mV	
Input Impedance	---		---	Ω	
Bandwidth	---		---		
Low				kHz	
Medium				kHz	
High				MHz	

The input and output voltages are limited to the PSoC analog voltages, Vssa and Vdda

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