

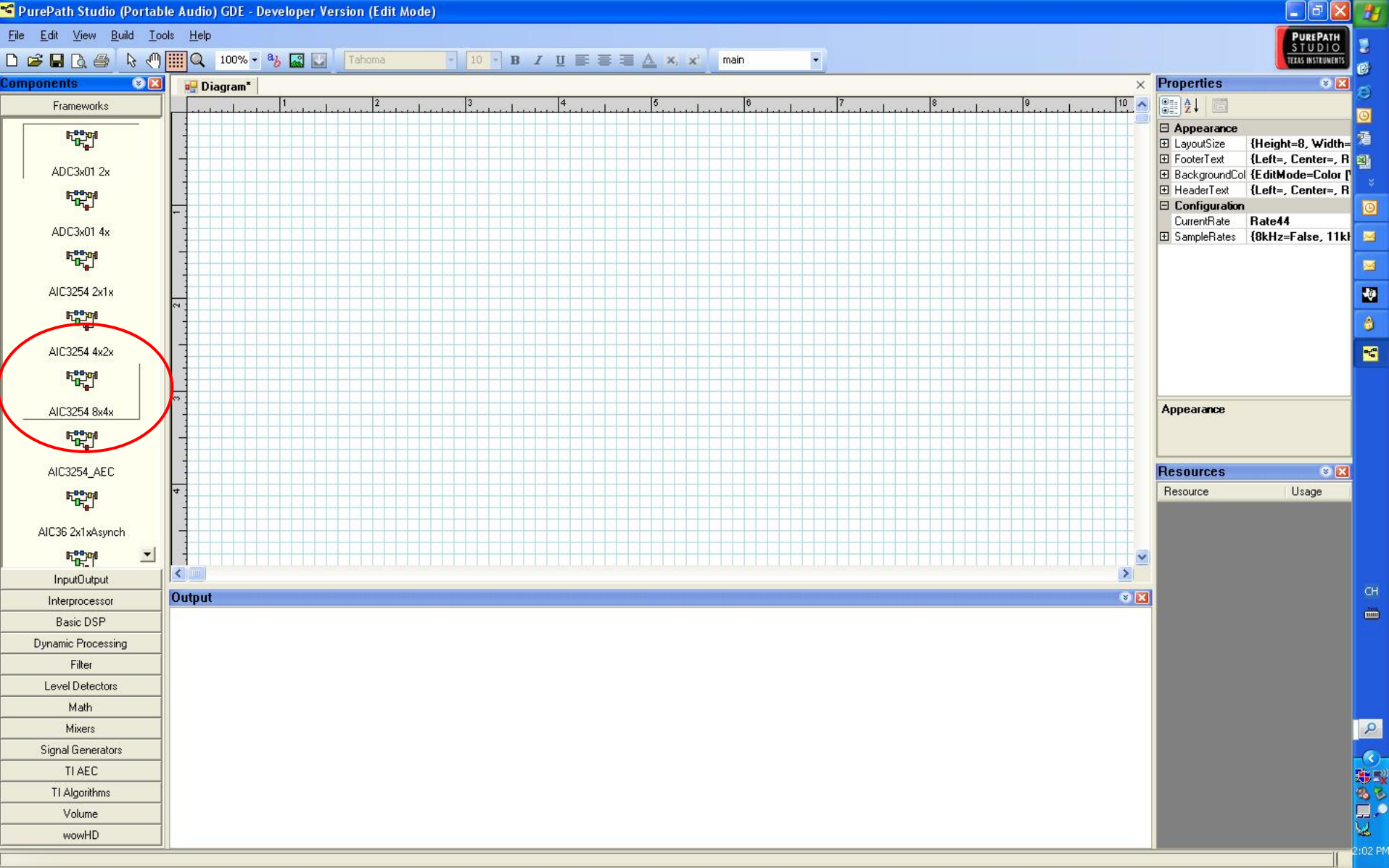
Using PurePath Studio Step by Step

Texas Instruments

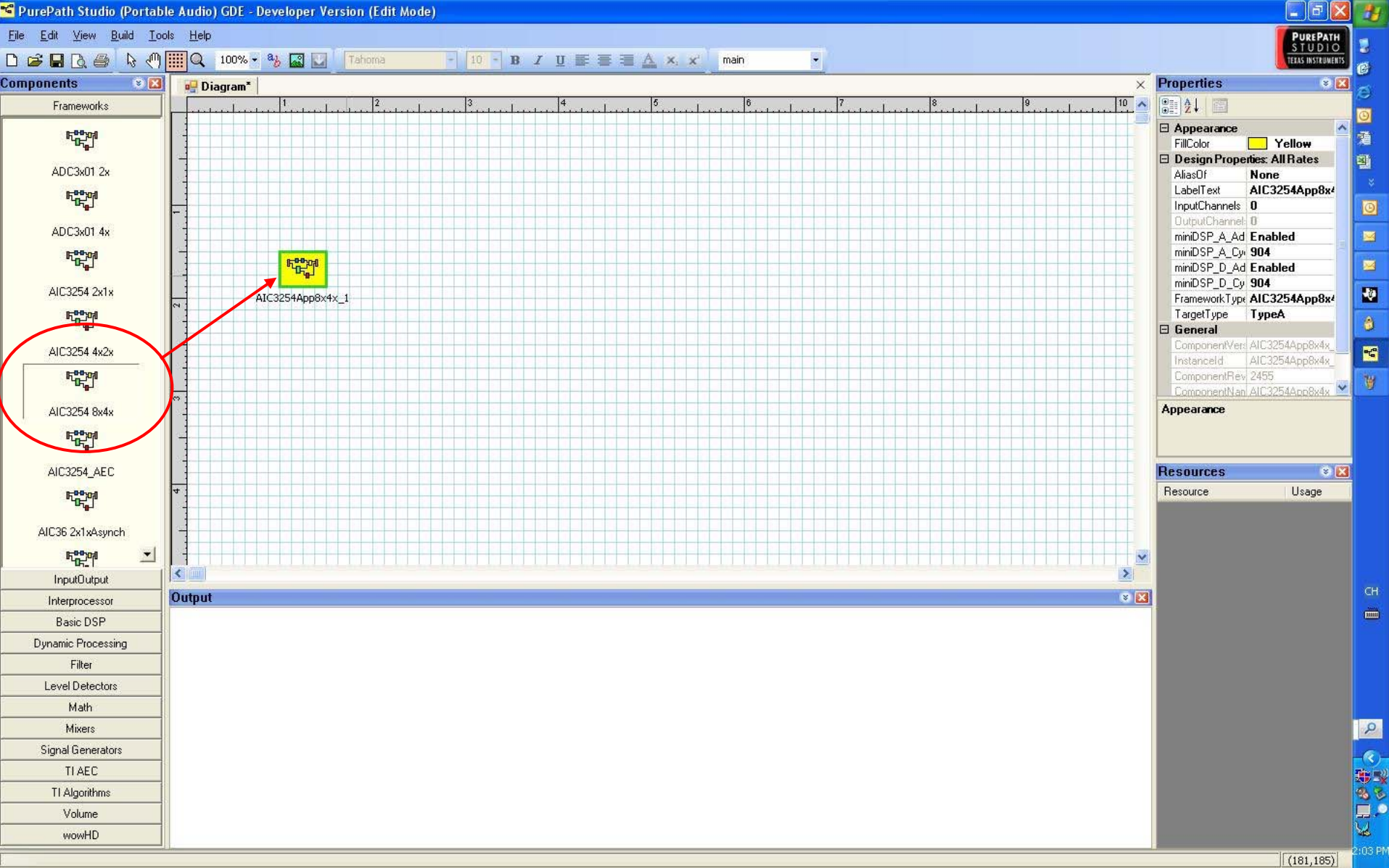
Peter Pai

Chapter 1

Quick Use



1. Find the proper Frameworks



2. Pull the correct Frameworks on the platform

PurePath Studio (Portable Audio) GDE - Developer Version (Edit Mode)

File Edit View Build Tools Help

100% Tahoma 10 B I U

main

Components

Frameworks

InputOutput

Dec1xIn

Dec2xIn

Dec4xIn

I2S_In

I2S_Out

Int2xOut

Int4xOut

Interprocessor

Basic DSP

Dynamic Processing

Filter

Level Detectors

Math

Mixers

Signal Generators

TI AEC

TI Algorithms

Volume

wowHD

Diagram*

1 2 3 4 5 6 7 8 9 10

1 2 3 4

AIC3254App8x4x_1

I2S_In_1

Properties

Appearance

FillColor LightSteelBlue

Design Properties: All Rates

AliasOf None

LabelText I2S_In_1

InputChannels 0

OutputChannel 2

TargetProcess miniDSP_D

General

ComponentVers I2S_In_TI_v1

InstanceId I2S_In_1

ComponentRev 2340

ComponentName I2S_In

Appearance

Resources

Resource Usage

Output

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The screenshot shows the PurePath Studio interface. On the left, the 'Components' panel lists various audio processing blocks. The 'I2S_In' block is highlighted with a red circle. A red arrow points from this block to the 'I2S_In_1' block in the main 'Diagram' area. The 'Properties' panel on the right shows the configuration for the selected 'I2S_In_1' block, including its appearance, design properties, and general information. The 'Output' panel at the bottom is currently empty.

3. You could pull any other blocks on the platform

PurePath Studio (Portable Audio) GDE - Developer Version (Edit Mode)

File Edit View Build Tools Help

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main

Components

Frameworks

InputOutput

Dec4xIn

I2S_In

I2S_Out

Int2xOut

Int4xOut

Int8xOut

MonoDec1xIn

Interprocessor

Basic DSP

Dynamic Processing

Filter

Level Detectors

Math

Mixers

Signal Generators

TI AEC

TI Algorithms

Volume

wowHD

Diagram*

1 2 3 4 5 6 7 8 9 10

1 2 3 4

AIC3254App8x4x_1

I2S_In_1

Int8xOut_1

Properties

Appearance

FillColor Yellow

Component Interface

Design Properties: All Rates

AliasOf None

LabelText Int8xOut_1

InputChannels 2

OutputChannel 0

TargetProcess miniDSP_D

General

ComponentVers Int8xOut_TI_v1

InstanceId Int8xOut_1

ComponentRev 2450

ComponentName Int8xOut

Runtime Properties: All Rates

Volume_Control 0.0

HPF_n0 0.99972534179

HPF_n1 -0.99972534179

Appearance

Resources

Resource Usage

Output

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4. For example, we pull the I2S input and DAC output on the platform

PurePath Studio (Portable Audio) GDE - Developer Version (Edit Mode)

File Edit View Build Tools Help

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main

Components

- Frameworks
- InputOutput
- Interprocessor
- Basic DSP
- Dynamic Processing
- Filter
- Level Detectors
- Math
- Mixers
- Signal Generators
- TI AEC
- TI Algorithms
- Volume

Diagram*

1 2 3 4 5 6 7 8 9 10

1 2 3 4

AIC3254App8x4x_1

I2S_In_1

Int8xOut_1

Volume_1

Volume

Properties

- Appearance
 - FillColor: Lime
- Component Interface
- Design Properties: All Rates
 - AliasOf: None
 - LabelText: Volume_1
 - InputChannels: 1
 - OutputChannels: 1
 - TargetProcess: miniDSP_D
- General
 - ComponentVers: Volume_T1_v2
 - InstanceId: Volume_1
 - ComponentRev: 2187
 - ComponentName: Volume
- Runtime Properties: All Rates
 - Volume: 0
 - VolumeCoefficient: 4194304

Resources

Resource	Usage
----------	-------

Output

wowHD

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5. We now trying to do a simple volume control process flow

PurePath Studio (Portable Audio) GDE - Developer Version (Edit Mode)

File Edit View Build Tools Help

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main

Components

- Frameworks
- InputOutput
- Interprocessor
- Basic DSP
- Dynamic Processing
- Filter
- Level Detectors
- Math
- Mixers
- Signal Generators
- TI AEC
- TI Algorithms
- Volume

Diagram*

1 2 3 4 5 6 7 8 9 10

1 2 3 4

AIC3254App8x4x_1

I2S_In_1

Volume_1

Int8xOut_1

Properties

Appearance

FillColor Lime

Component Interface

Design Properties: All Rates

LabelText None

InputChannels 1

OutputChannel 1

TargetProcess 2

General

ComponentVer 3

Instanceld 4

ComponentName Volume

Runtime Properties: All Rates

Volume 0

VolumeCoefficient 4194304

InputChannels

Resources

Resource Usage

Output

wowHD

6. We could change the number of channel in the Design Properties

PurePath Studio (Portable Audio) GDE - Developer Version (Edit Mode)

File Edit View Build Tools Help

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main

Components

- Frameworks
- InputOutput
- Interprocessor
- Basic DSP
- Dynamic Processing
- Filter
- Level Detectors
- Math
- Mixers
- Signal Generators
- TI AEC
- TI Algorithms
- Volume

Volume

Diagram*

1 2 3 4 5 6 7 8 9 10

1 2 3 4

AIC3254App8x4x_1

I2S_In_1

Int8xOut_1

Volume_1

Properties

Appearance

- LayoutSize {Height=8, Width=}
- FooterText {Left=, Center=, R}
- BackgroundCol {EditMode=Color P}
- HeaderText {Left=, Center=, R}

Configuration

- CurrentRate Rate44
- SampleRates {8kHz=False, 11kHz=}

Resources

Resource	Usage
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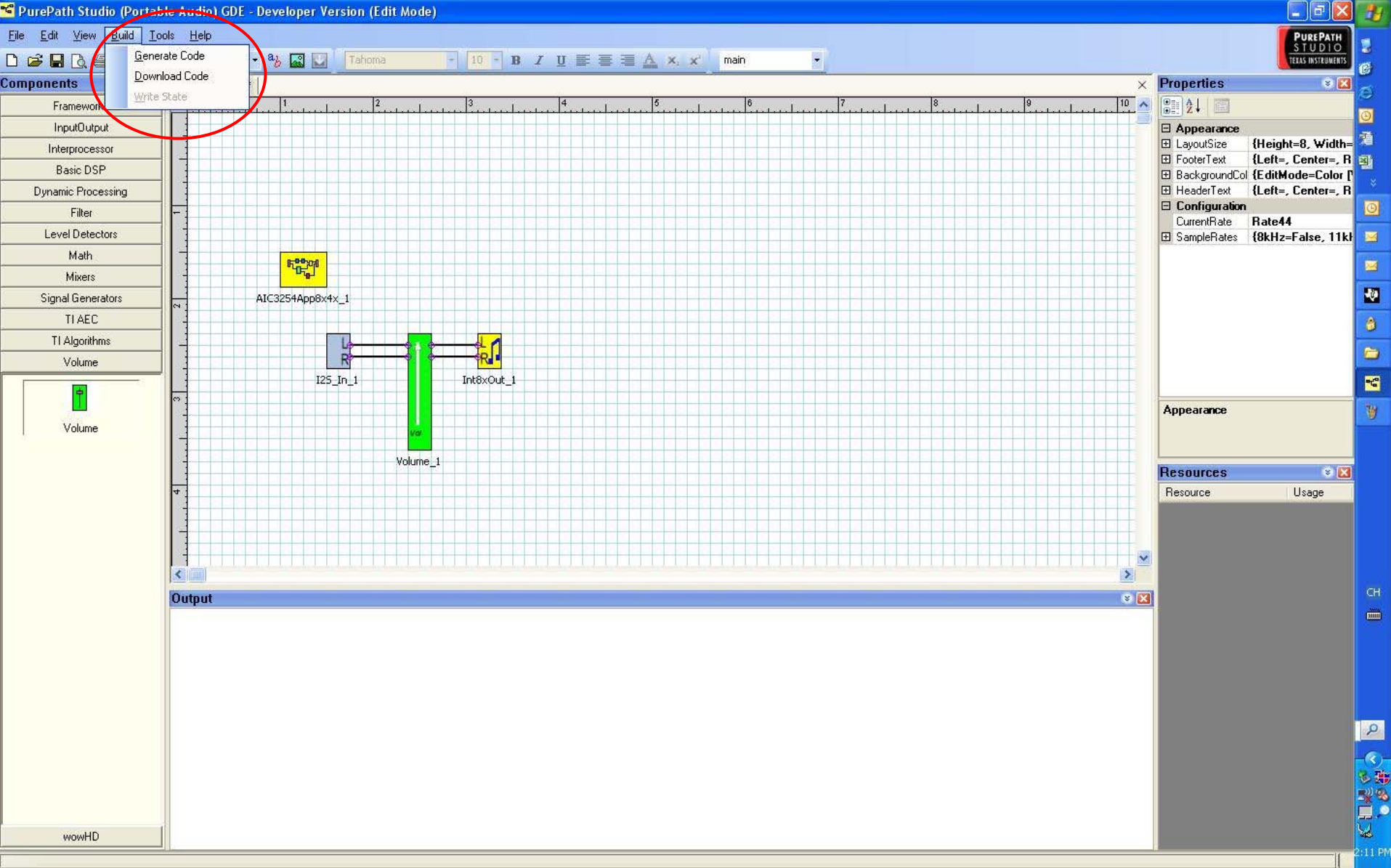
Output

wowHD

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7. Left click from point to point connecting all the blocks

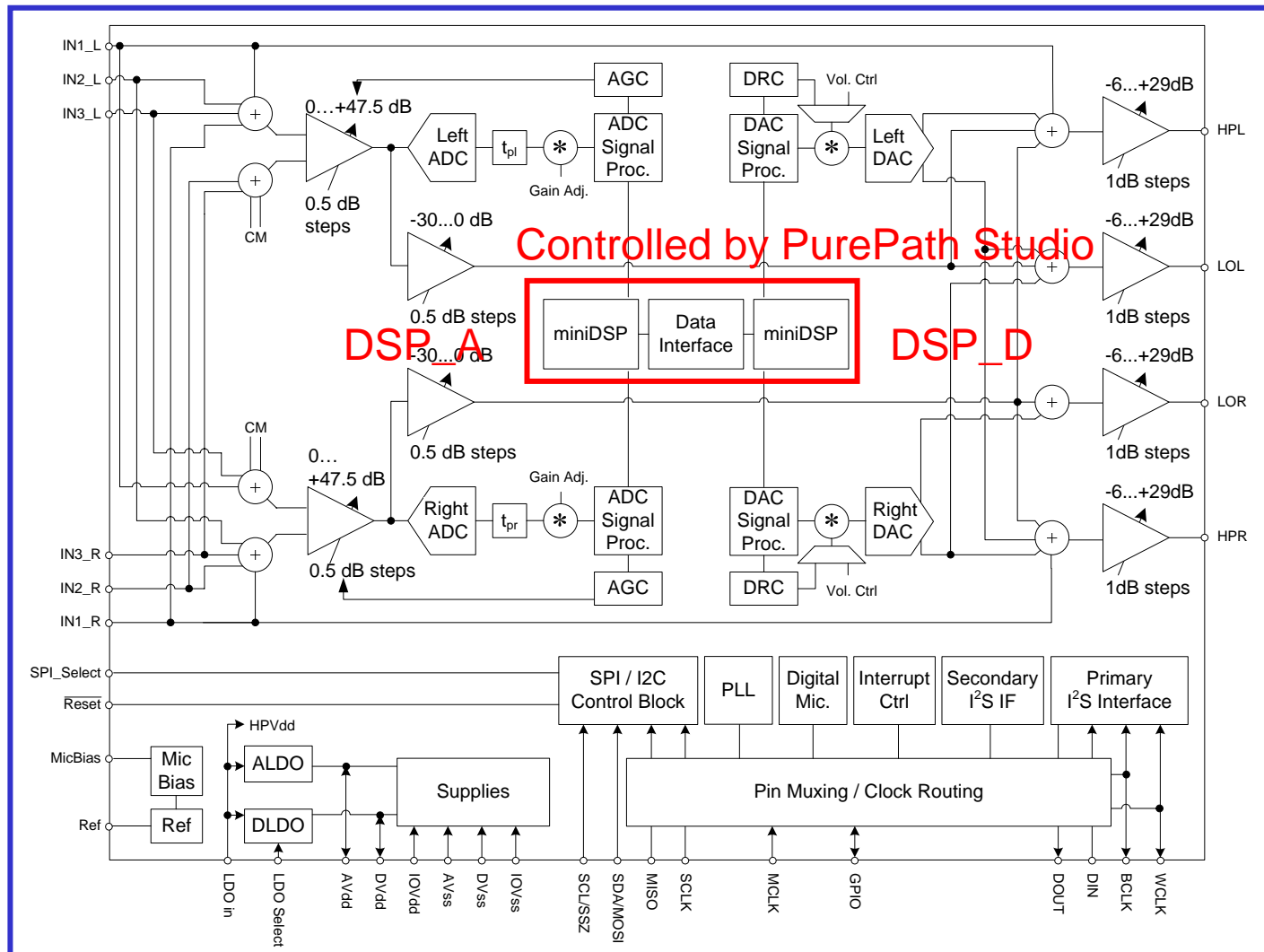


8. And then you could download the code into AIC3254EVM !

Chapter 2

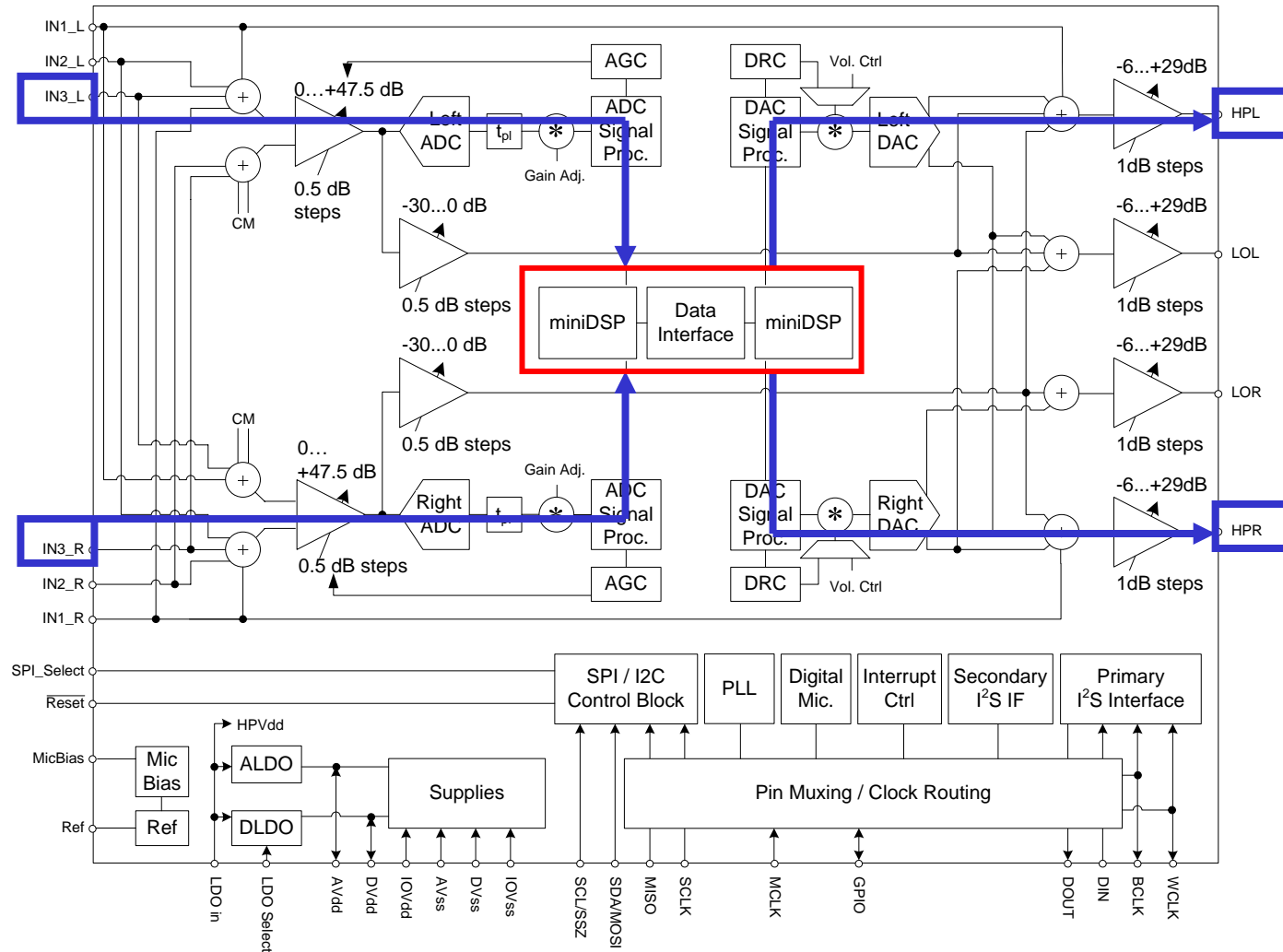
Basic concept

For example: This is the block diagram of AIC3254

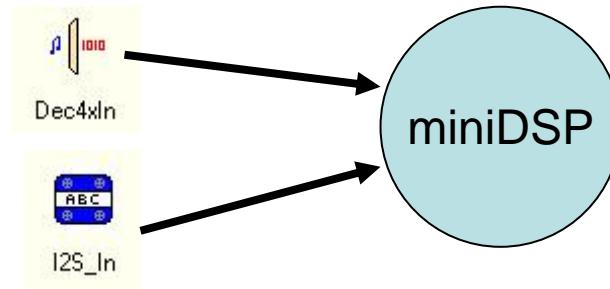


Controlled by Control Software

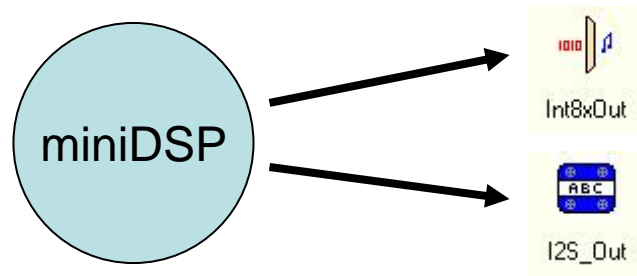
For easier evaluation, PPS uses some default settings
So, you could evaluate our codec without considering the Control Software



In PPS, miniDSP could get the Audio data from ADC or I2S interface.



Or, miniDSP could send the Audio data to DAC or I2S interface.

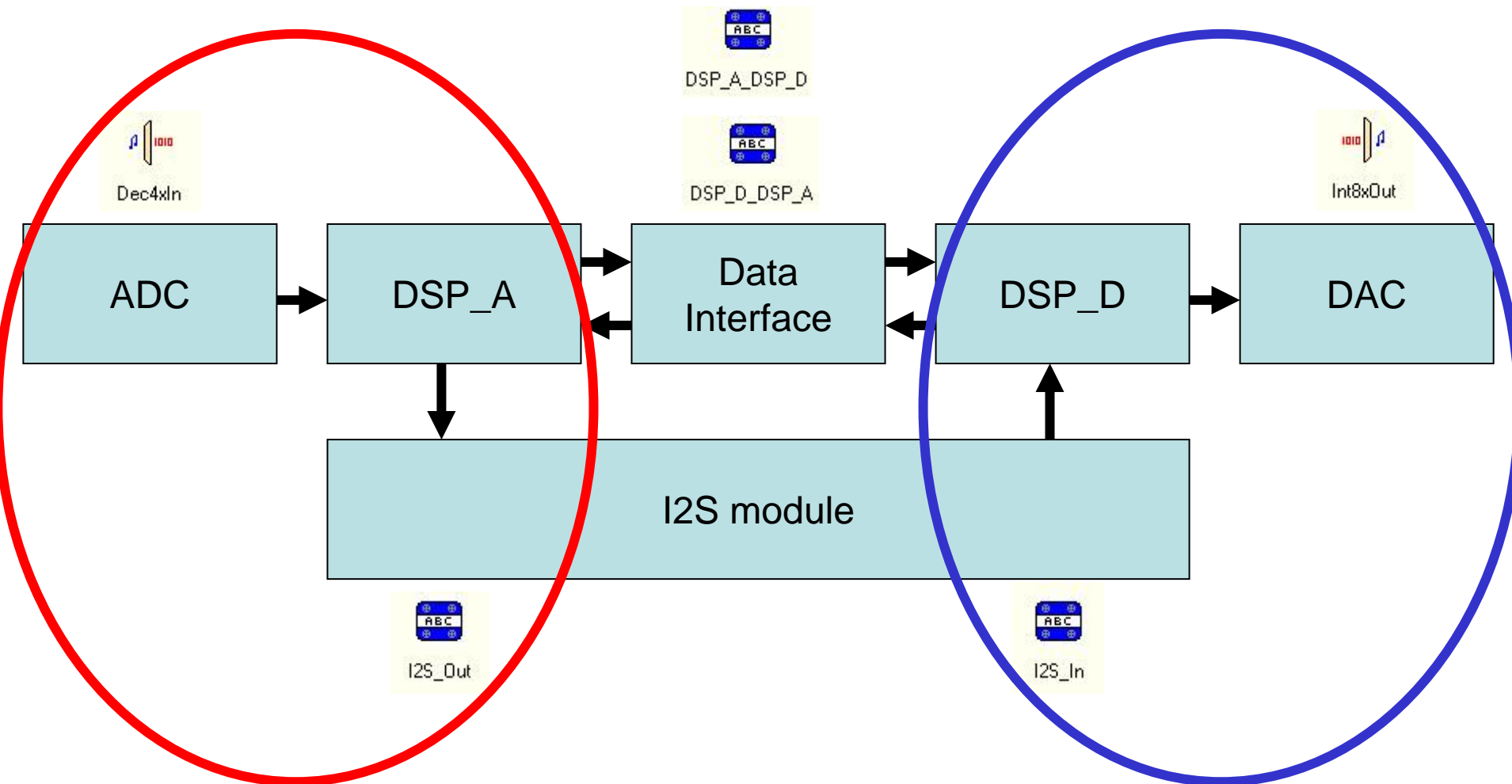


But, what are DSP_A and DSP_D?

As you could see below, here is the block diagram of how our codec works

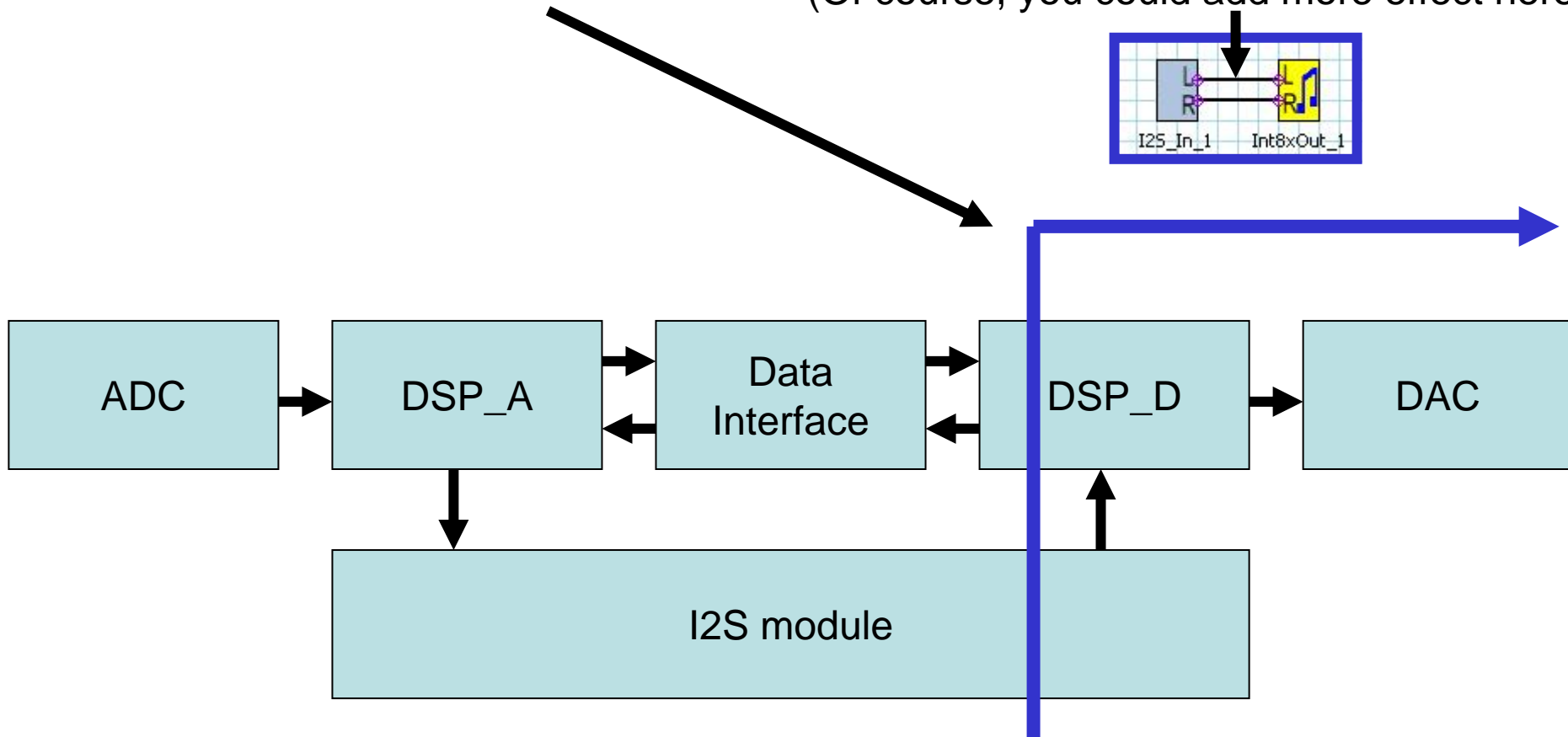
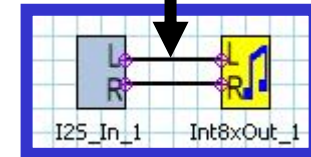
There are two miniDSPs called “DSP_A” and “DSP_D” in AIC3254.
(DSP_A means DSP of ADC, DSP_D means DSP of DAC)

Each miniDSP has its own resource and could be connected by data interface which you could find them in “Interprocessor” in PPS

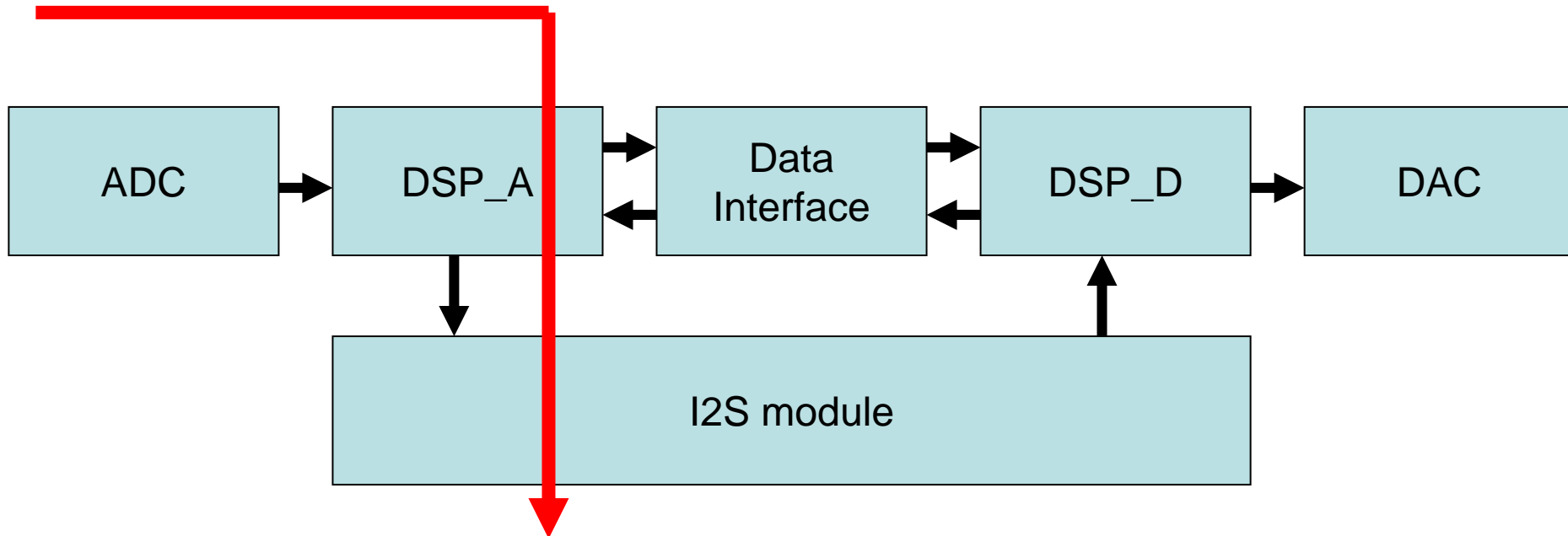
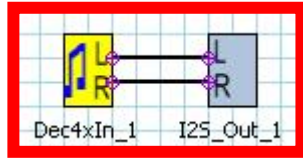


For example, blue line is the playback path
and uses DSP_D resource

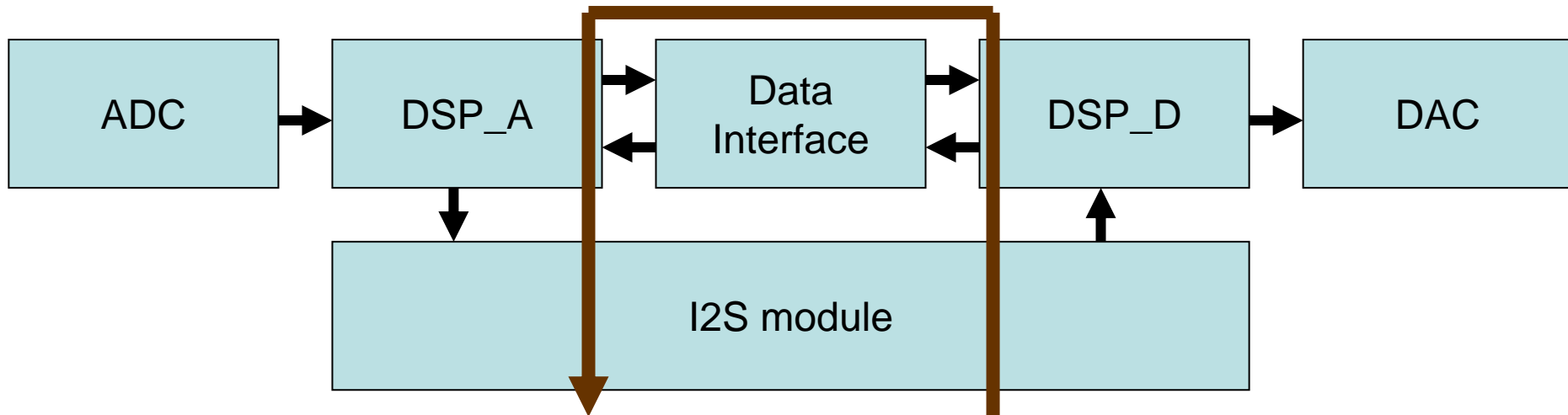
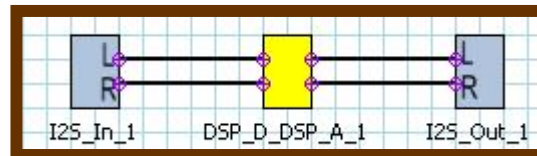
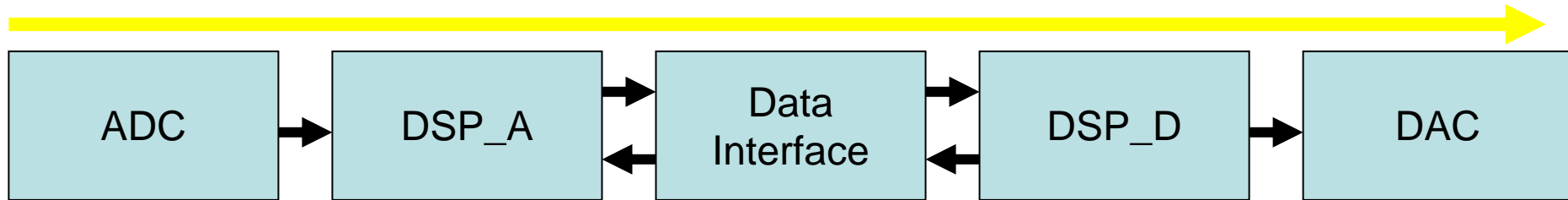
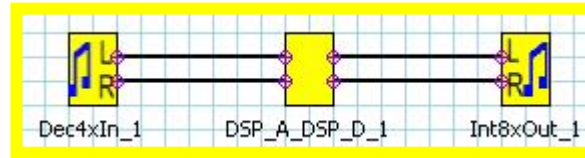
(Of course, you could add more effect here)



And red line is the record path which uses DSP_A resource



Yellow and brown lines show the possibility to use AIC3254 in Analog-Digital-Analog mode and Digital-Digital mode



Even if playback path uses DSP_D resource,
we could utilize DSP_A resource by using data interface
It's really flexible.

