Overview

The CT7601 serial chip is a high performance USB audio bridge. It supports the DSD I/F and DoP on S/PDIF input/output channels. The I2C software control mode is available on this chip.

There are 2 kind of package on CT7601 serial chip: LQFP 80pin and QFN 48pin. The evaluation boards also have 2 types available for these 2 different package chips:

EVM-G-A: for LQFP 80 pin

EVM-G-B: for QFN 48 pin

CT7601_EVM-G-A is a full function audio evaluation system for LQFP 80pin type package. The SPDIF, I2S, DSD/DOP, SRC, DAC and MCU control are combined on this board. This architecture is simple to verify and apply CT7601 family chip to any audio system product.

The CT7601_EVM-G-A interface:

- digital audio input port
  - USB SPDIF x 1
  - Record SPDIF x1
- digital audio output port
  - USB SPDIF output port x2
  - SRC SPDIF output port x2
- analog audio output port
  - AUX analog output with high performance I2S DAC x2
- analog audio input port
  - high performance 8 channel record port

- Hardware control mode
  - Power on latch configuration
- Software control
  - External I2C control path to access CT7601 directly
  - Internal 8051 MCU with GPIO/I2C control

Block Diagram

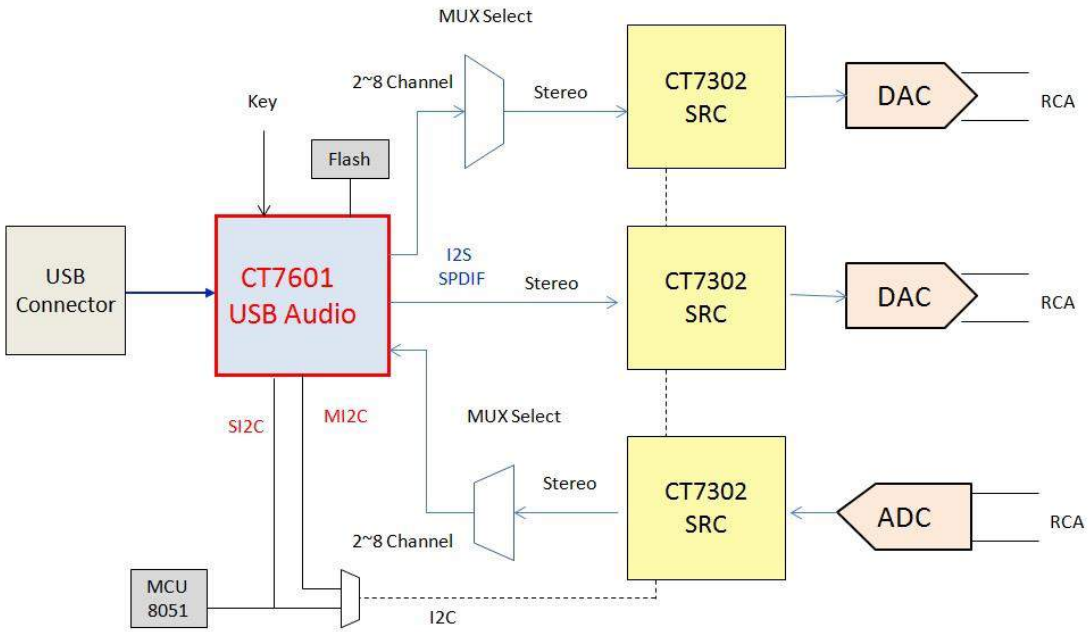


Figure1. Block diagram

PCB Overview

EVM-G-A for LQFP 80 pin

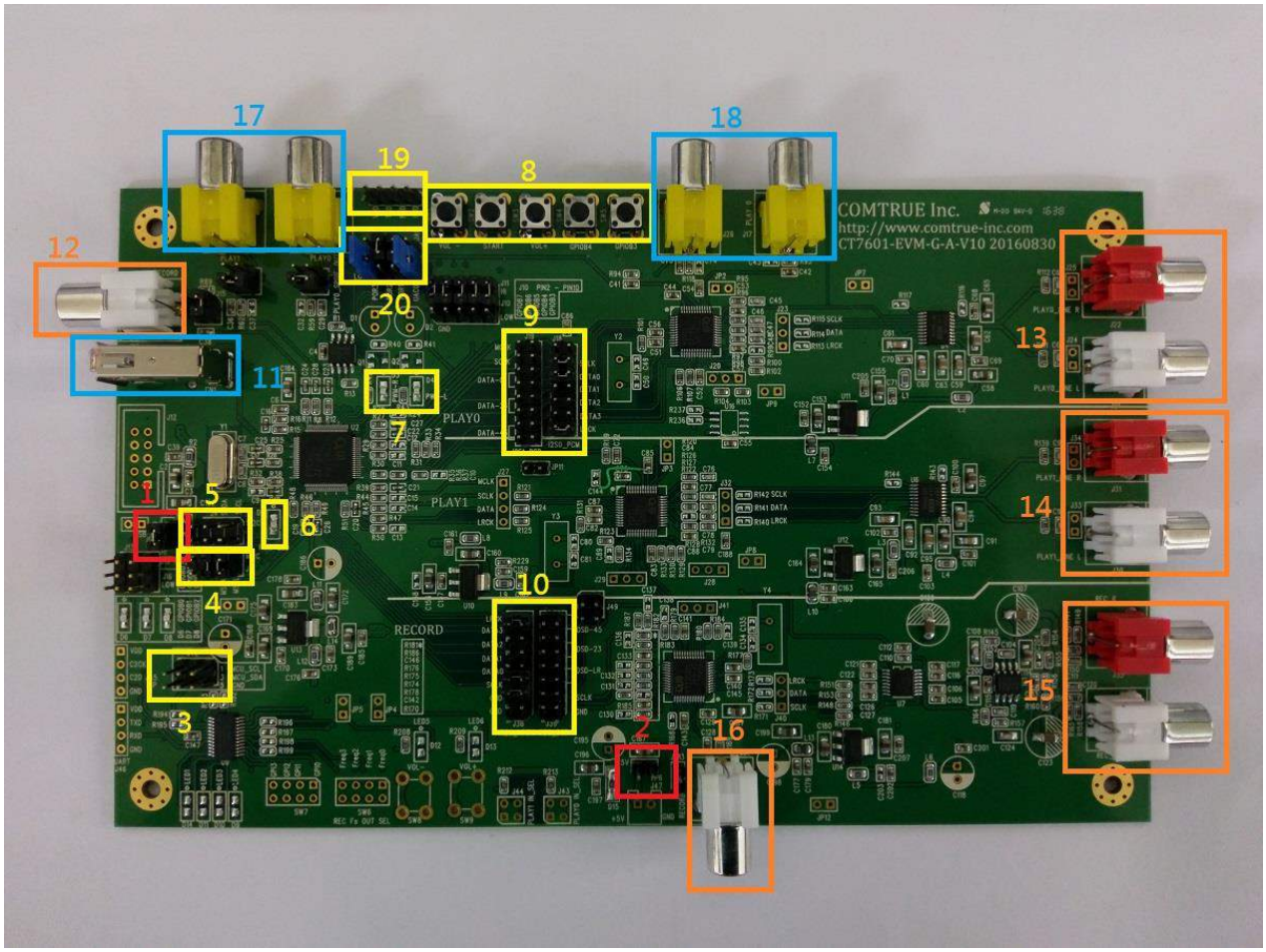
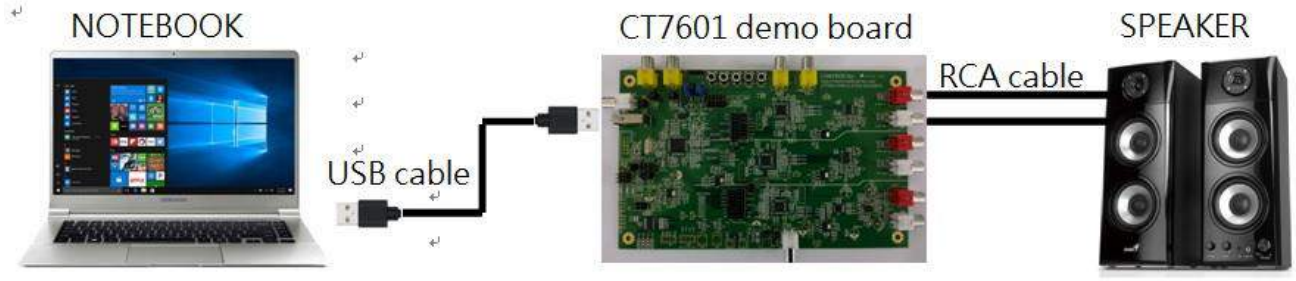


Figure2. PCB Overview

No	Function	Description
1	USB bus power jump	Use USB bus power to demo board when jump short it
2	Self power jump	Provide external +5V power to demo board
3	MCU I2C	I2C control select
4	Master I2C	I2C control select (default use)
5	Slave I2C	I2C control select
6	PWM LED	Default : Breathing light mode Play Music : Rhythm light mode
7	PWM-L/R	Default : Breathing light mode Play Music : Rhythm light mode
8	Control button	HID button control (support VOL+/VOL-/Play/Previous/Next)
9	Play0 data output port	Select Play0 output data from PCM or DSD
10	Record data input port	Select Record input data from PCM or DSD
11	USB connector	Connect to USB host port
12	USB SPDIF IN	USB SPDIF IN
13	Play0 analog output	Play0 analog output
14	Play1 analog output	Play1 analog output
15	Record analog input	Record analog input
16	SPDIF record input	Record input source from SPDIF port
17	USB SPDIF output	J6 : USB Play0 SPDIF output J9 : USB Play1 SPDIF output
18	SRC SPDIF output	J17 : CT7302 Play0 SPDIF output J26 : CT7302 Play1 SPDIF output
19	USB UART control port	USB UART control port
20	USB mode select pin	It have 3 different mode can choose 1:UAC2 mode 2:UAC1 mode 3:firmware update mdoe

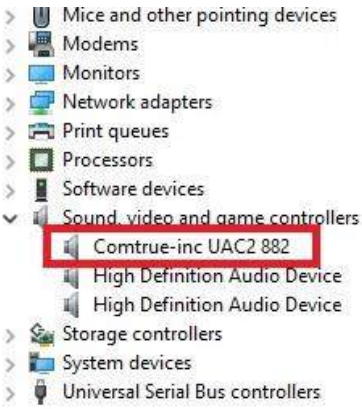
Quickly Start

Playback Connection Diagram



This EVM board is ready for use immediately. User can follow the procedure to set up the evaluation system for test.

1. Connect USB A-TYPE cable to EVM board's USB port and another side USB cable connect to windows / MAC or Linux USB port.
2. Install ct7601_setup.exe and and check Device Manager. Under Sound, video and game controllers, it will have new device "Comtrue-inc UAC2 822".
   https://www.comtrue-inc.com/index.php/download2/category/4-ct7601

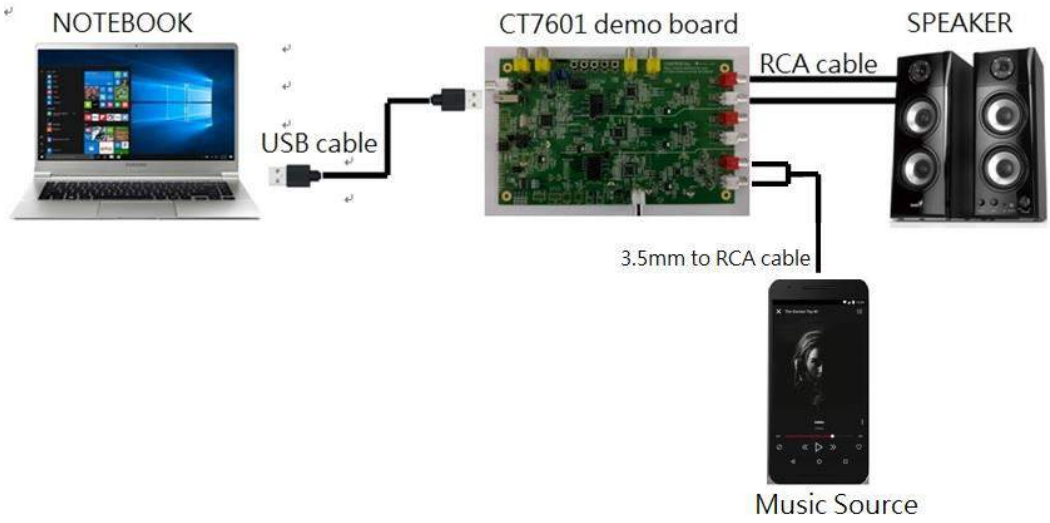


3. If you use win7 and can't install driver, please install Microsoft hotfixed as below link
   https://www.microsoft.com/en-us/download/details.aspx?id=46148

4. The EVM board's driver have two play music mode. One is WDM mode another one is ASIO mode. For WDM mode it can use Microsoft Media Player to play it. The maximum support PCM 384K/32bit. For ASIO mode need use third party software to play it. We suggest use foobar2000 to play it. Please see how to install foobar2000 as below.
5. Download latest stable version and Install foobar2000 to play ASIO driver. http://www.foobar2000.org/download
6. Download and install ASIO support 2.1.2 component for foobar2000
   http://www.foobar2000.org/components/view/foo_out_asio
7. Download and install foo_input_sacd component for foobar2000
   https://sourceforge.net/projects/sacddecoder/files/foo_input_sacd/

8. Download and install ASIO proxy https://sourceforge.net/projects/sacddecoder/files/foo_dsd_asio/
9. Connect analog output to your speaker.
10. Start play music and enjoy it

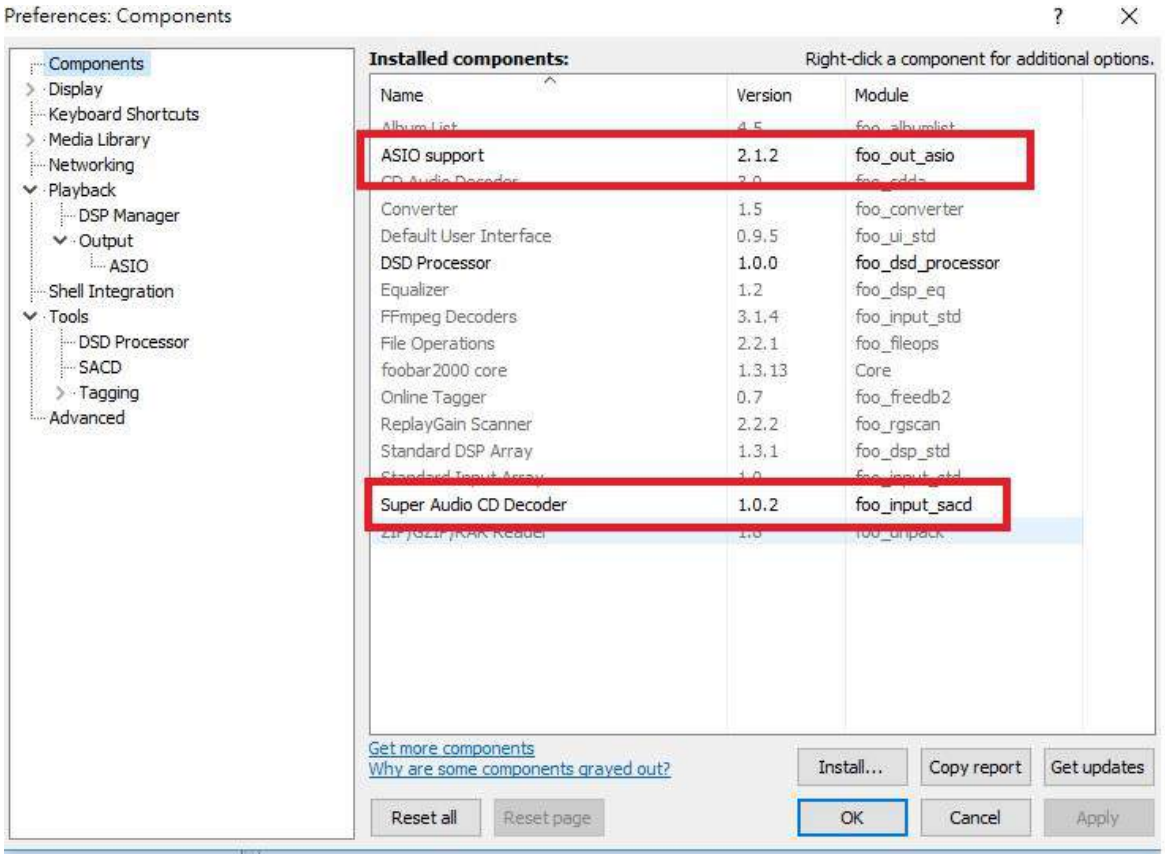
Record Connection Diagram



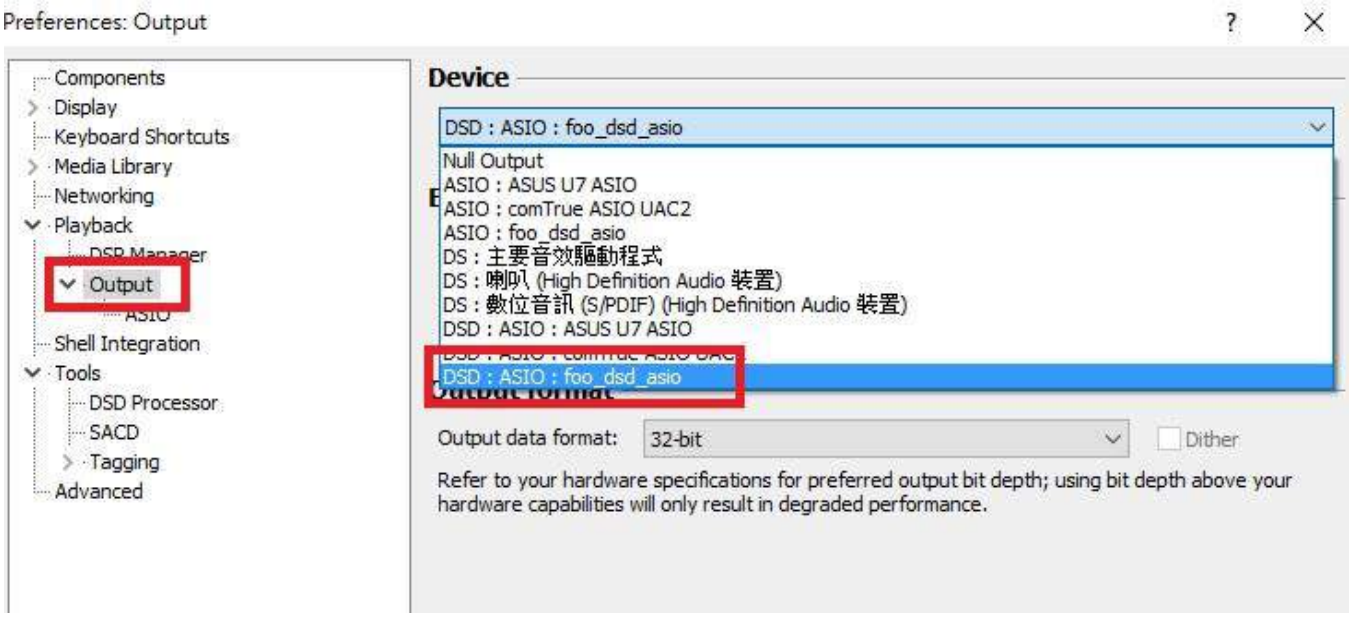
1. Connect USB A-TYPE cable to EVM board's USB port and another side USB cable connect to windows / MAC or Linux USB port.
2. Connect music source to EVM board's like DVD player , media player , mobile phone…
3. Connect analog output to your speaker if you want to listen it.
4. Use Microsoft default tool "Sound Recorder" or other recorder software to record file
5. Start record music and enjoy it

How to setup foobar2000

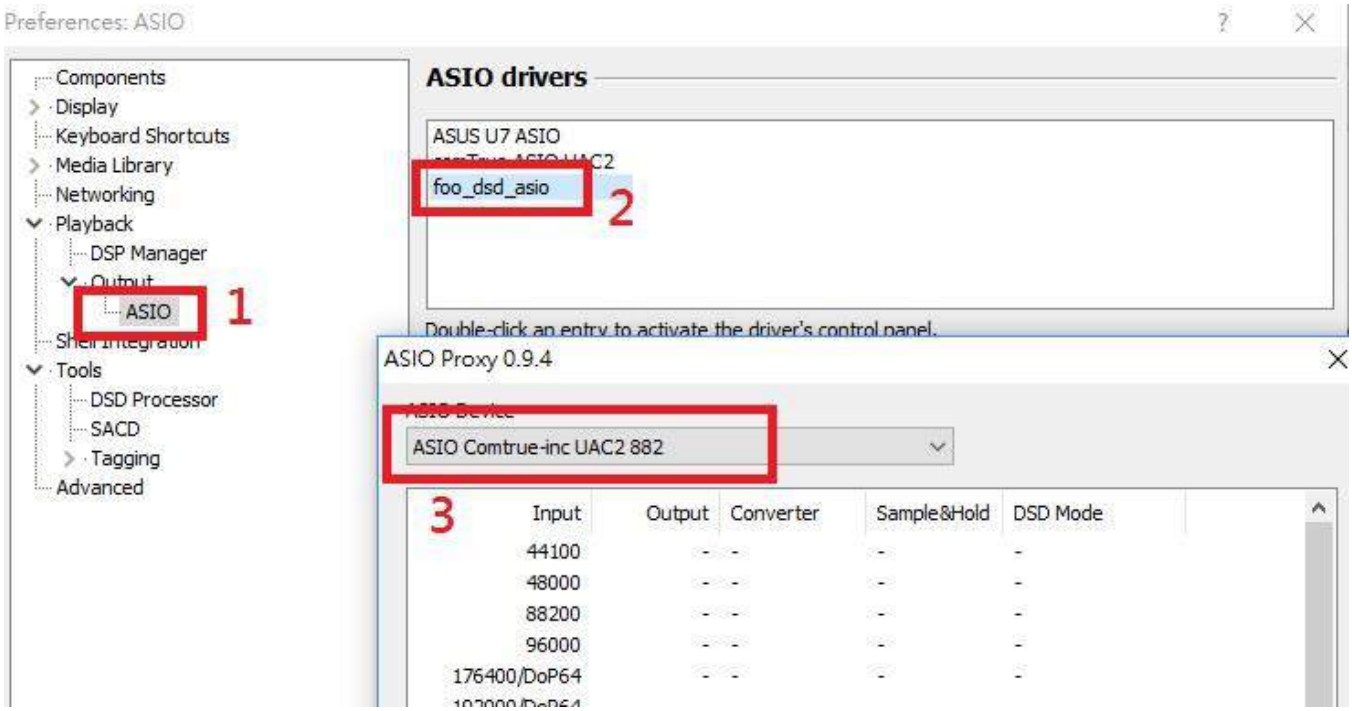
1. Go to file/Preferences/Components Check external component install success, the will add new component like as below picture



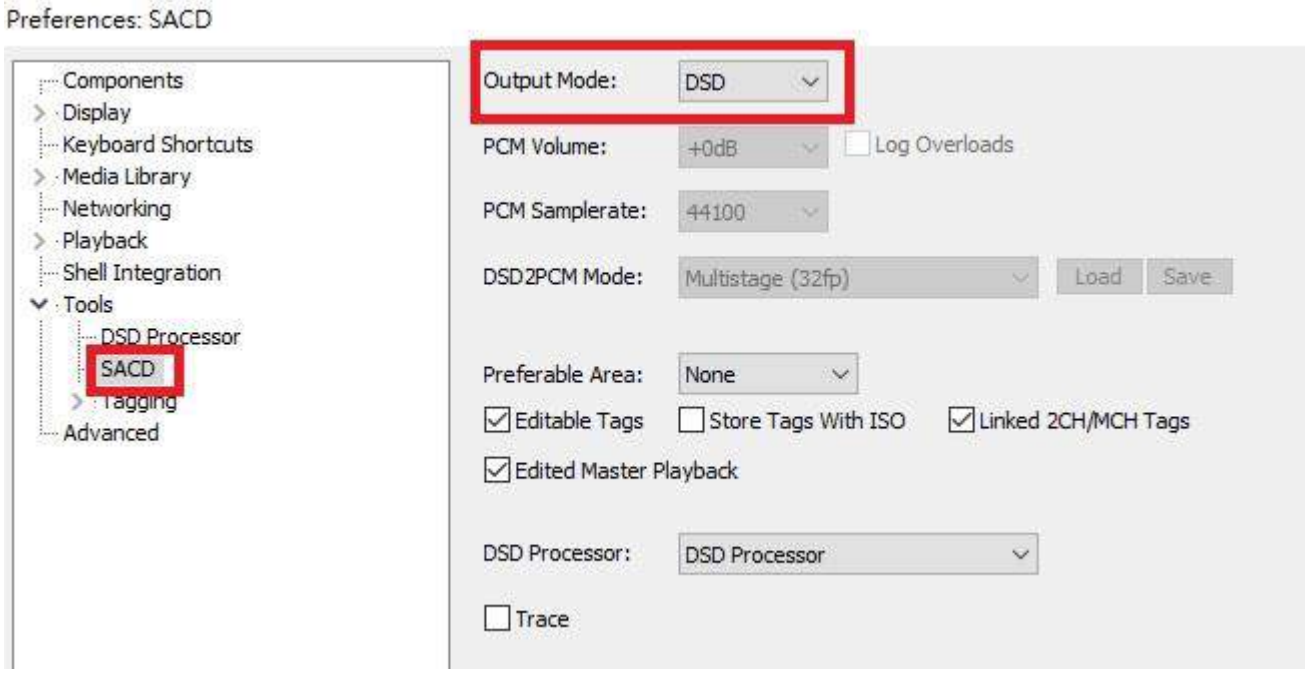
2. Go to file/Preferences/Playback/Output Choose DSD:ASIO:foo_dsd_asio



3 Go to file/Preferences/Playback/Output/ASIO, double click foo_dsd_asio andchoose" ASIO Comtrue-inc UAC2 882"



4 Go to file/Preferences/Tools/SACD, Output Mode please choose DSD



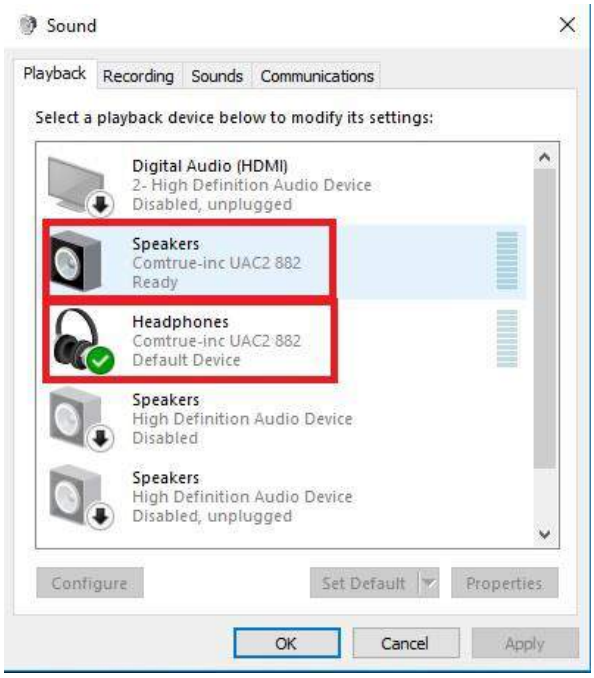
5. Choose music and you can play it now.

How to change different Play mode

Windows Play mode setup

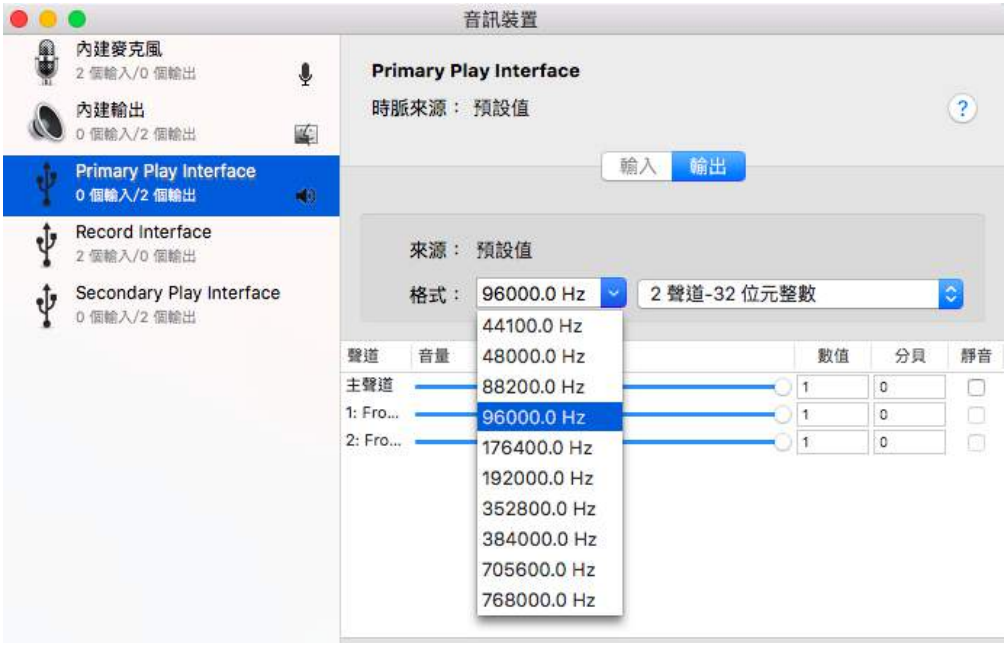
1. Choose Speck and click mouse right button then select “Sounds”.

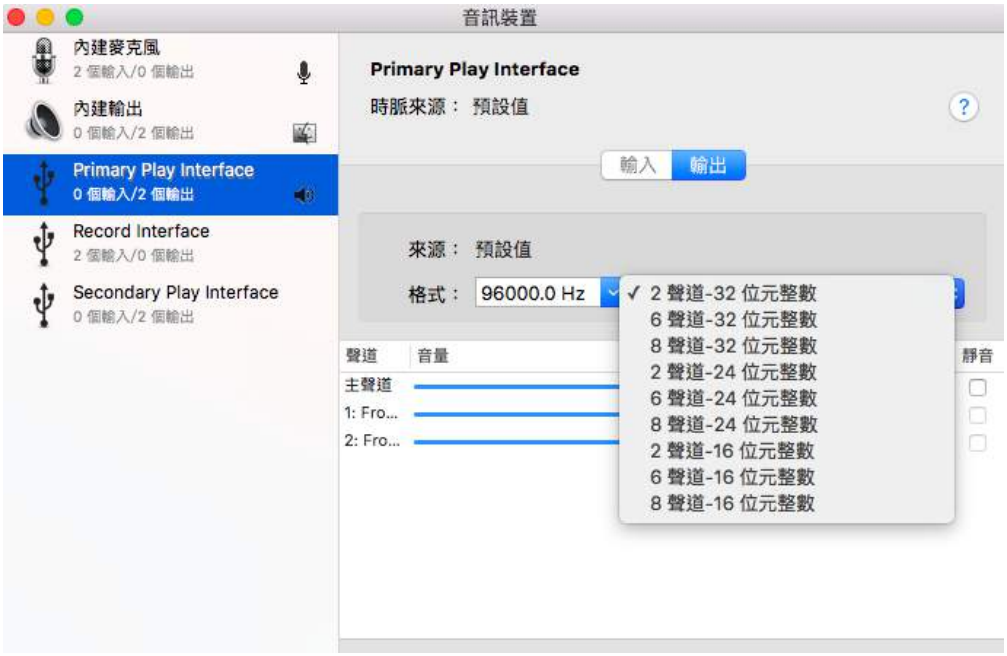
2. You can see two USB audio, one is Speakers for Play0 another one is Headhones for Play1. Play0 support 8 Channels, Play0 support stereo channel.



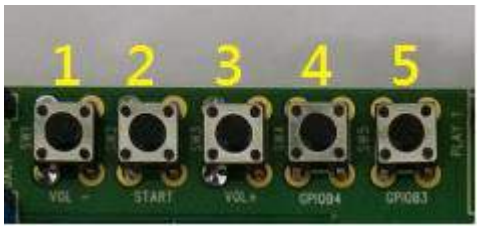
MAC Play mode setup

1. MAC use UAC2 standard driver, so demo board don’t need install driver. Please directly plug demo board to MAC USB port.
2. Use Spotlight to search “Midi” and use it to select Play mode. Primary Play Interface=> Play0 mode, Secondary Play Interface=> Play1 mode.
3. The MIDI also can select audio format and channels. The audio format maximum can support to 768K/32bit.



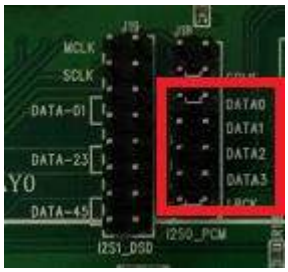


HID Button



NO.	NAME	FUNCTION
1	VOL-	Volume -
2	START	Playback
3	VOL+	Volume +
4	GPIOB4	Next
5	GPIOB3	Previous

Multi-Channel setting (J18)



NAME	5.1 Channel	7.1 Channel
DATA0	Front-L/R	Front-L/R
DATA1	Center/Subwoofer	Center/Subwoofer
DATA2	Surround-L/R	Rear-L/R
DATA3	N/A	Surround-L/R

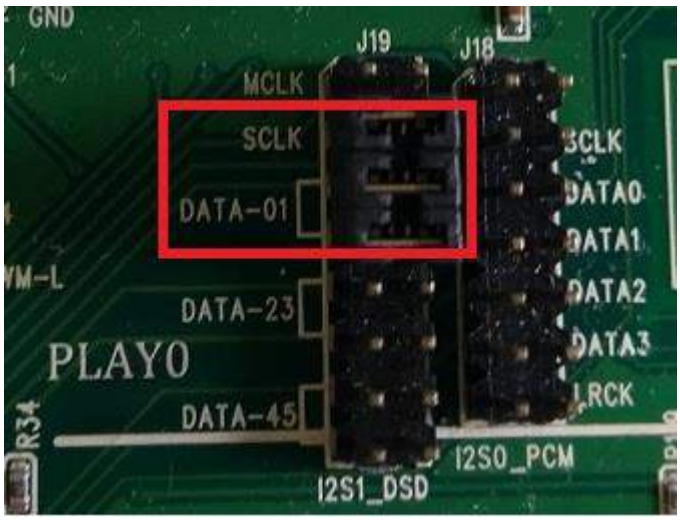
I2C Function

NAME	Description
SI2C(J4)	Slave I2C mode, use external I2C to control CT7601 and others chipset
MI2C(J7)	Master I2C mode, CT7601 use internal 8051 control others chipset

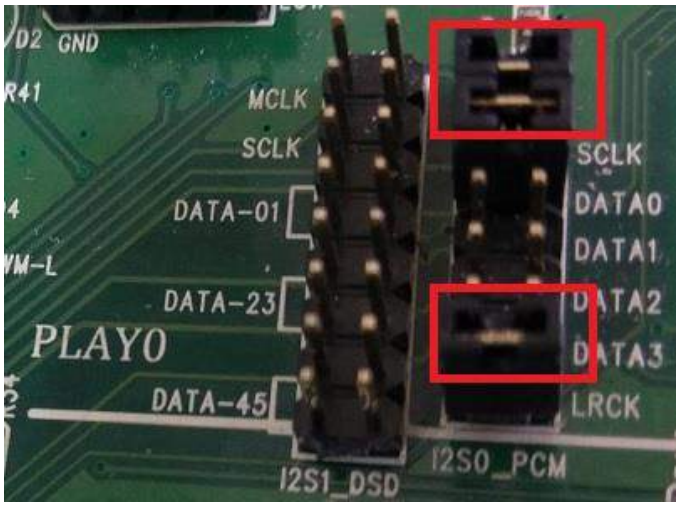
How to change CT7601 Play0 I2S DSD or PCM output source

It can change jump setting to select I2S DSD or PCM output

1. I2S DSD output setting(J19) : move jump setting to “SCLK” and “DATA-01” like below picture



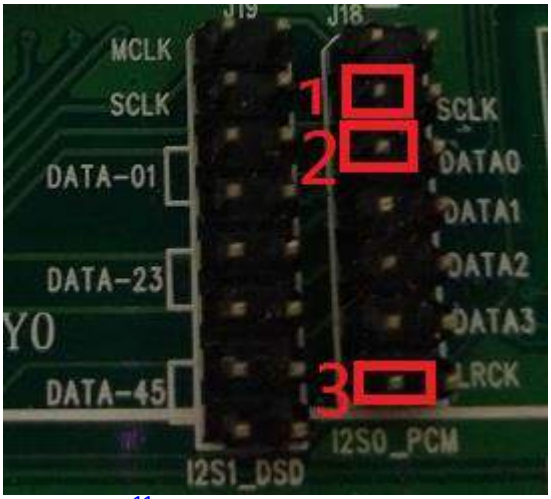
2. I2S PCM output setting(J18) : move jump setting to “SCLK”,” DATA0” and “LRCK” like below picture



How to use I2S PCM directly output

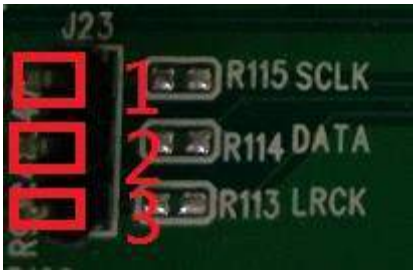
1. It can use CT7601 I2S PCM output function (J18) jump to your system I2S PCM input.

NO.	NAME
1	SCLK
2	DATA0
3	LRCK



2. It can use CT7302 I2S PCM output function (J23) jump to your system I2S PCM input.

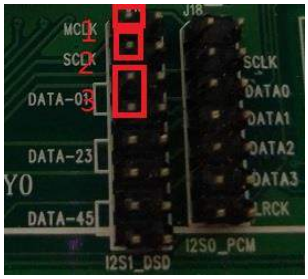
NO.	NAME
1	SCLK
2	DATA0
3	LRCK



How to I2S DSD directly output

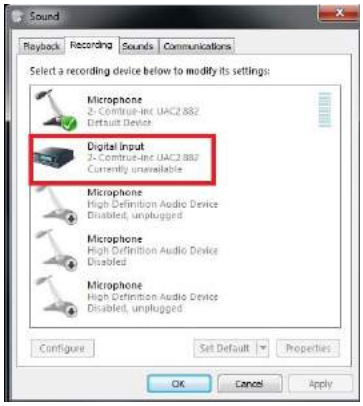
1. It can use CT7601 I2S DSD output function (J18) jump to your system I2S DSD input.

NO.	NAME	FUNCTION
1	MCLK	Depends your codes use it.
2	SCLK	I2S serial clock output
3	DATA-01	I2S serial data output

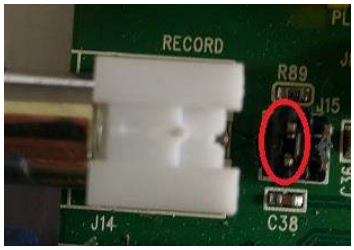


How to use SPDIF record

1. Plug-in SPDIF output source to EVM board record SPDIF input(J14)
2. Click mouse right button, change “Digital Input” to set as Default Device.



3. Check J15 jump is correct like below picture.



4. Use record software like windows built in software “Sound Recorder” start to record.