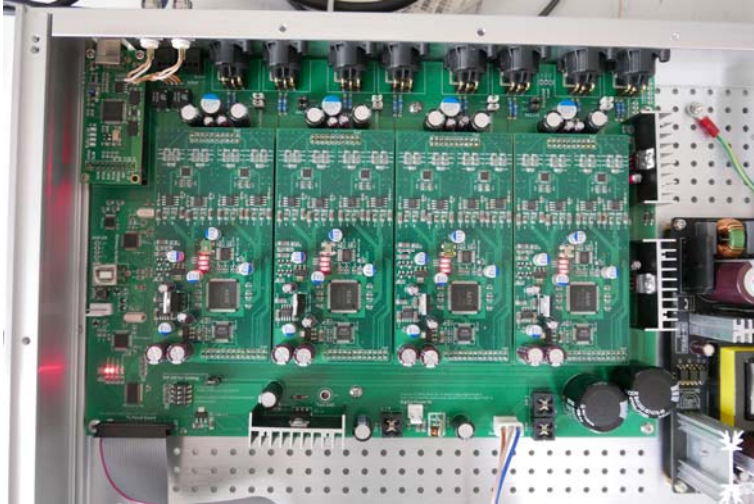# Step 4 test from here. (QG1 needs to be implemented)

7. Preparation for "digital input test".

The test must be connected to A_1345897 and A_1350385. A_1350385 can operate normally if there are 1, 2, or 4 from the right. (If "○" is empty and "●" is A_1350385, then "○○○●" or "○○●●" or "●●●●")

The hardware used here must be connected to your PC via USB. The connector is USB 3.0, but 2.0 will work just fine. You will need to install the driver on your Windows PC. Please download from the following link. UnRAR and install it and connect to USB from PC.
https://www.matrix-digi.com/en/products/314.html

Secondly, you will need a function generator for testing. The purpose of this is to create a sine wave on your PC and send it to a USB audio device. It doesn't matter what method you use.
https://listoffreeware.com/best-free-signal-generator-software-windows/
If your selected software uses the standard Windows audio output, make sure you change your Windows sound output device to "Matrix X-SPDIF".
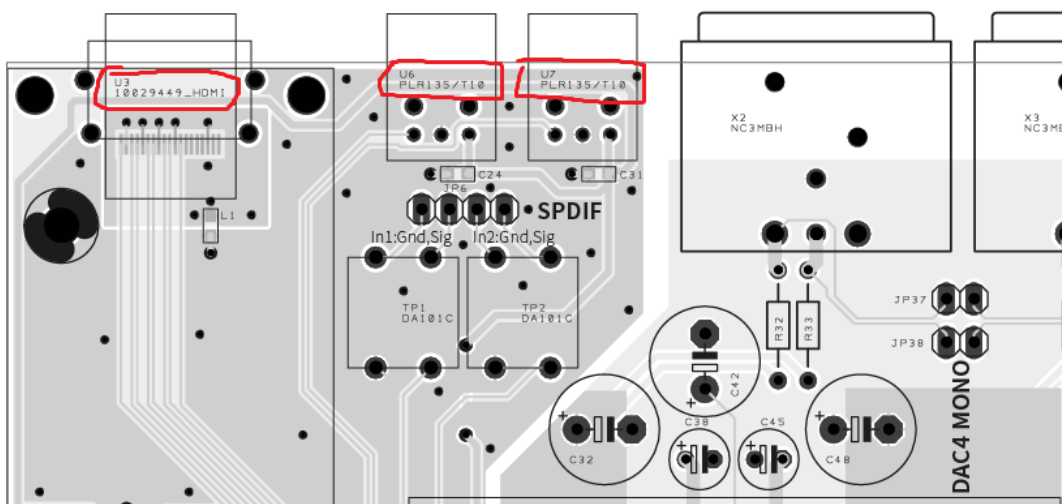
I'm using Japanese software. My explanation is via this software.
http://efu.jp.net/soft/wg/down_wg.html

8. Connect the board to the X-SPDIF.

Prepare cables for Optical and IIS-LVDS and connect them to the board. The cables are shipped with X-SPDIF.
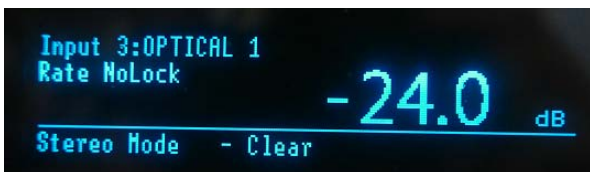

There are here on the board that you will make the connection. Test the connection in three locations.

9. Does the board correctly recognize the digital input?

When connected as shown in this image, A_1350338 should display the following. The input change is operated from A_1350338. To change the input, please see steps 3-4.


The reason why Optical1 is "NoLock", this is because the connector is empty.


Checkpoint

- The frequency displayed in sample is "44.1 kHz", but this may change depending on the PC's setting. The operation is good except for "NoLock".
- If everything is NoLock, the X-SPDIF may not be working properly.
- If OPTICAL 1 or 2 are NoLock, the problem may be with IC2 and its surrounding components.
- If HDMI I2S is NoLock, there may be a problem with U2 or IC2 and its peripheral components.

## 10. Output signal test from the A_1345897 + A_1350385
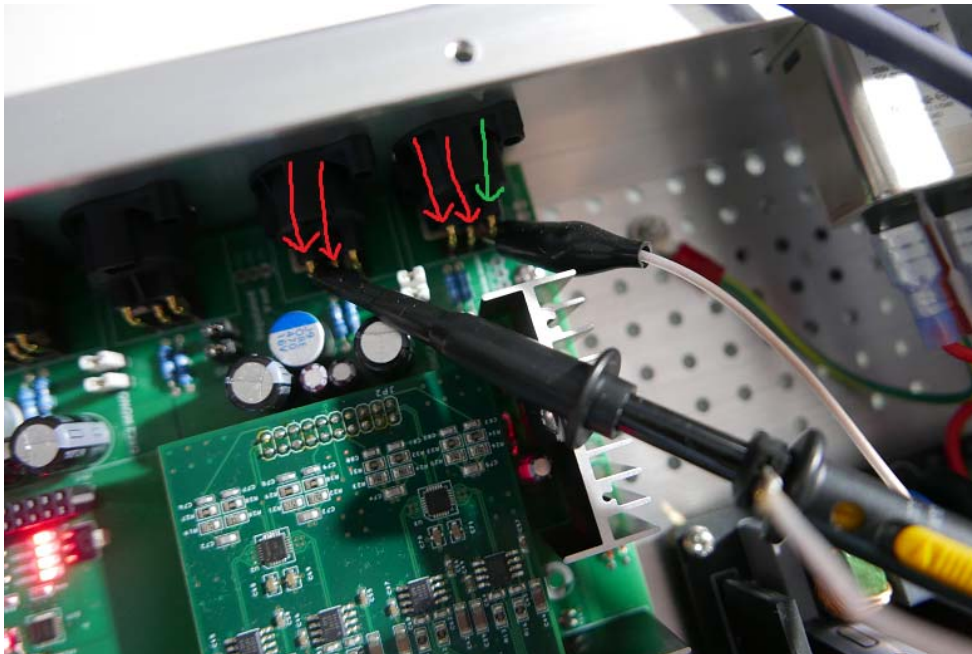
Prepare an oscilloscope and connect it as shown in the image. The pins to be measured are the red arrows and the GND is the green arrow.

Next, your PC should output to X-SPDIF a full scale sine wave. Full scale is 0dB-FS, but it may take some knowledge, because in FS, 0dB is the maximum and Lesser values are indicated by a negative value. So this is how the screen in my software is set up.
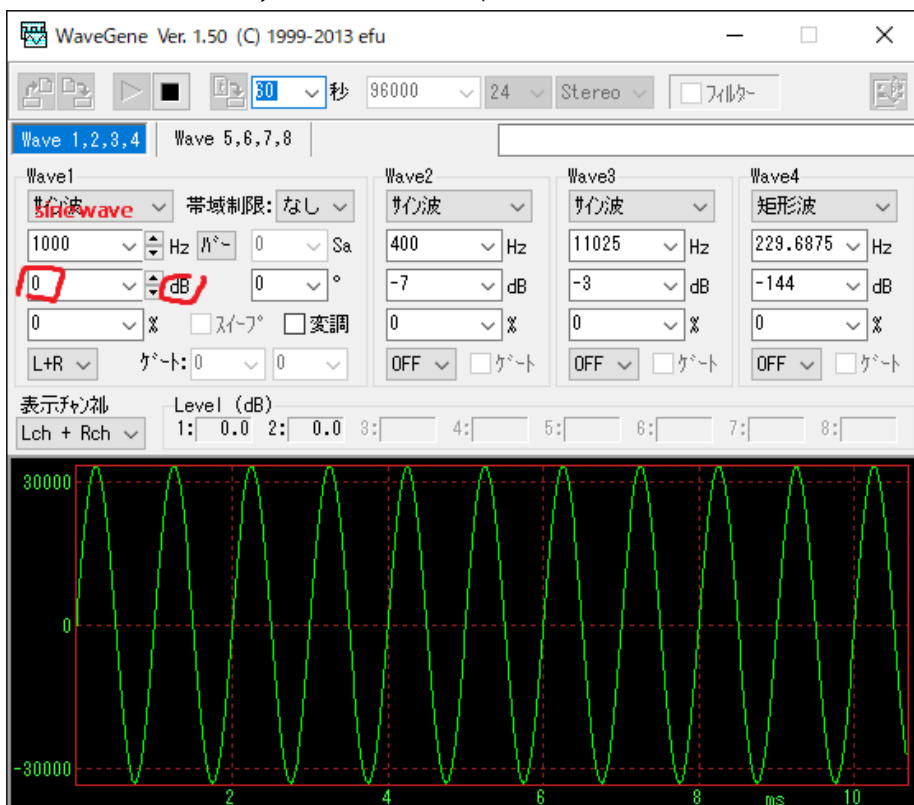
The dB number on the screen should be "0.0". If it is a small number "-24.0", the voltage may be too small for the oscilloscope.
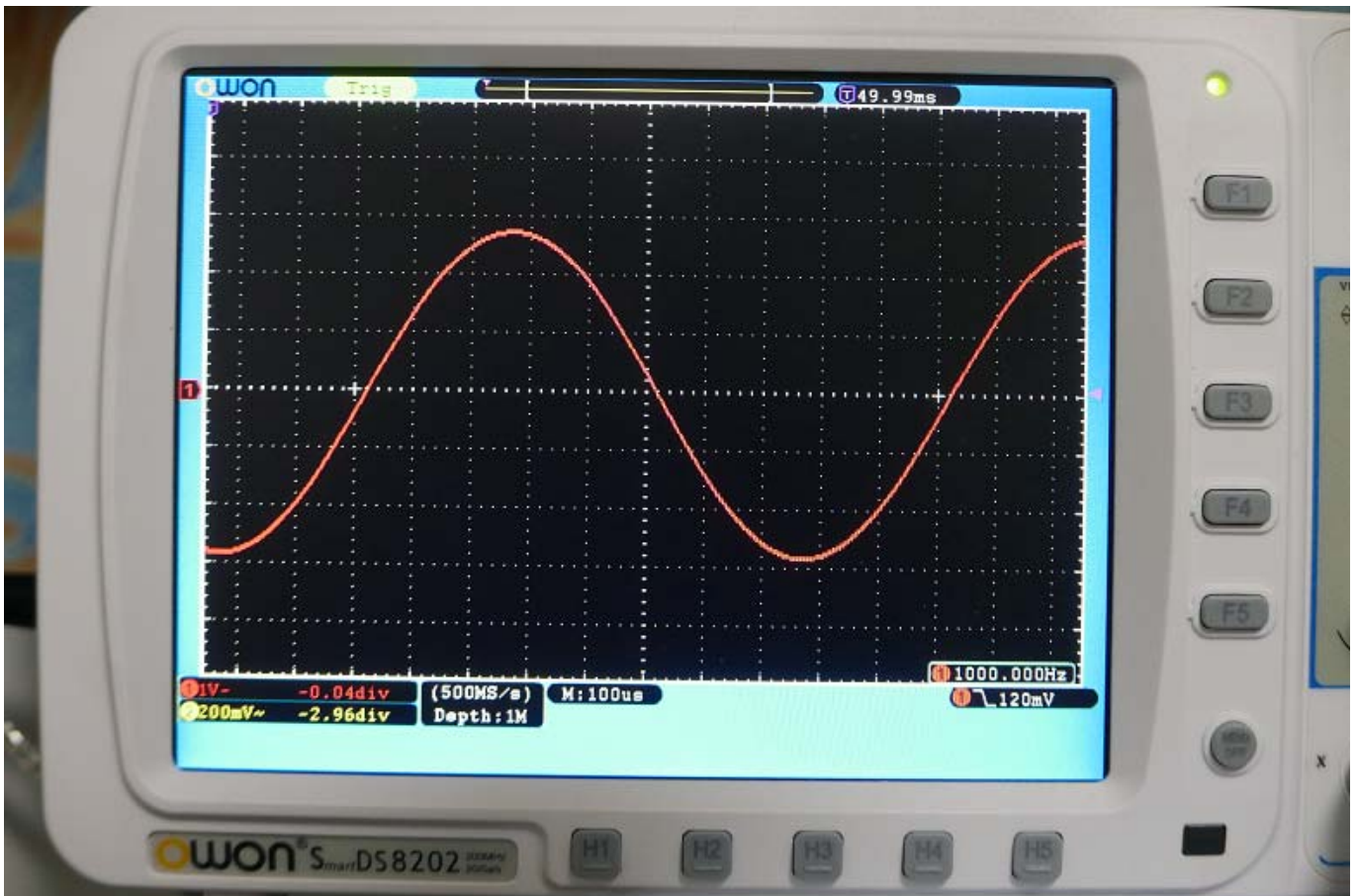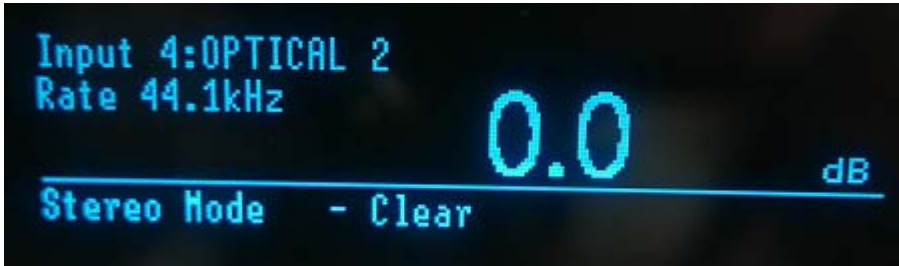
If all correct, the oscilloscope will measure to about 5.6 Vp-p on the oscilloscope. You should do this measurement on all four pins (at 4 red arrows in image) for one A_1350385 board.

Checkpoint

- DC voltage must be near 0V on all pins when no input signal.
- The amplitude voltage must be approximately the same on all pins.
- The waveform must not be broken as a sine wave..
- If not all voltages are outputting, there may be a problem with A_1350385 IC1, IC3, QG1, U1 and all peripheral components above. Or IC3 and peripheral components on A_1345897.
- If there is an abnormality in voltage or waveform or amplitude, the following problems are likely: A_1350385 IC4, IC5, IC6, IC7, U2, U3, and all peripheral components above.

If everything is working properly, the test is complete.

Other information

When installing and removing A_1350385 from A_1345897, A_1350385 Bending can cause physical damage to the ceramic capacitor. The "broken at short mode" can cause damage to A_1345897. Caution is required.

The outputs of the DAC1-4(A_1350385) correspond to the connector outputs with the same color, as shown in the image below.