GENERAL DESCRIPTION
AKD5374-A is an evaluation board for AK5374, which is a stereo A/D Converter with a USB 2.0 interface. The AK5374 can be tested easily on the AKD5374-A, as the operation of the device is compatible with USB standard audio class. The AKD5374-A has not only an external audio interface, but also an external EEPROM that all descriptor contents are stored and customizable.

Ordering guide
AKD5374-A --- Evaluation board for AK5374

FUNCTION
- Microphone Jack
- 3.3 volt Regulator (LM1117-3.3V)
- 8k bit EEPROM(AK6508CT)
- USB B-type Connector

* Circuit diagram and PCB layout are attached at the end of this manual
Figure 2. AKD5374-A top view

- **Outline Chart**

- **Comment**

1. **VDD3.3V, GND**
   These are the power supply connectors. Connect power supply with these pins. As for the detail comments, refer to the setup of power supply on the next page.

2. **MCKI (BNC-JACK)**
   This is external clock source for the MCKI/XTI pin of the AK5374.

3. **USB1 (USB Connector)**
   This is USB B-type connector for evaluation of the AK5374. Connect this to PC.

4. **USB2 (USB Connector)**
   This is USB B-type connector for EEPROM write operation.

5. **J2, J3 (Mini Jacks)**
   These are analog signal inputs.

6. **PORT5, PORT6 (10 pin header)**
   PORT5 (TEST PORT): It is not used except test mode

7. **SW1 (Switch)**
   SW1: Reset of AK5374. Keep “H” during normal operation.
### Operation sequence

1) Set up the jumper pins as the followings.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AVDD</td>
<td>DVDD</td>
<td>VDD</td>
<td>REGMODE</td>
</tr>
<tr>
<td>+3.3V REG</td>
<td>EEP 5373</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) Connect USB1 port of the AKD5374-A to PC with an USB cable. Windows recognizes the AK5374 automatically, and it is not necessary to install any driver. Device manage shows “AK5374” as an USB Audio Device in “Sound, video and game controllers” if Windows recognizes the device successfully.

![Device Manager](image)

**Figure 3.** Device Manager “Sound, video and game controllers”

3) Double click “USB Audio Device”, the window of “USB Audio Device Properties” shows the properties including device type as “Sound, video and game controllers”, Manufacturer as “Generic USB Audio”, and Location as “Location 0 (AK5374)”. 
**Evaluation mode**

**Internal ADC Streaming Mode**

Evaluation of using internal ADC of AK5374
USB1 (USB Connector) is used. Nothing should be connected to USB2 (USB Connector) and PORT6 (DSP).

![Diagram of Internal ADC Streaming Mode]

Figure 5. Internal ADC Streaming Mode
Evaluation

1) Runs “sound recorder” program in ‘accessory -> Entertainment’

![Figure 6. Sound Recorder](image)

2) Select “Edit” -> “Property”, and then select “USB Audio Device (1)” as “Preferred Device”.

![Figure 7. Audio Properties](image)
3) When the icon or Volume in the Sound Recording block is clicked, the volume slider window appears. The top points value means the maximum value of the AK5374 under Windows. The Mute all check box is displayed.

![Volume Control](image)

Figure 8. Volume Control

4) Select “File” -> “Property”, and then click “convert now.” button in the Property window. Then select “44100Hz 16bit Mono” or “44100Hz 16bit Stereo” as attribute on the Sound Recorder.

![Sound Selection](image)

Figure 9. Sound Selection

5) Check the microphone being plugged and volume control adjustment then you can start recording by pressing “Rec” button.
■ Other jumper pins set up

1. JP24, JP25 (GND) : These jumper pins should be OPEN on normal operation. <Default>

2. JP111 (MICRN) : Connection of microphone power.
   OPEN: Microphone power is not connected.
   SHORT: Microphone power is connected. <Default>

3. JP112 (MICRP) : Connection of microphone power.
   OPEN: Microphone power is not connected.
   SHORT: Microphone power is connected. <Default>

4. JP113 (MICLN) : Connection of microphone power.
   OPEN: Microphone power is not connected.
   SHORT: Microphone power is connected. <Default>

5. JP114 (MICLP) : Connection of microphone power.
   OPEN: Microphone power is not connected.
   SHORT: Microphone power is connected. <Default>

6. JP101 (CLKS) : Selection of external master clock input and crystal oscillator input.
   XTAL: Select crystal oscillator input. <Default>
   MCKI: Select external master clock input.

7. JP110 (XTE) : Selection of clock source for the MCKI/XTI pin.
   OPEN: Select X’tal as the clock source. (XTE pin = “H”) <Default>
   SHORT: Select external clock as the clock source (XTE pin = “L”)

8. JP16 (EXT) : Selection of external clock input impedance.
   OPEN: External clock input impedance is High impedance.
   SHORT: External clock input impedance is 51Ω. <Default>

   OPEN: 24MHz crystal resonator can be used as the master clock (CKM pin = “H”) <Default>
   SHORT: 16MHz crystal resonator can be used as the master clock (CKM pin = “L”)

10. JP131 (DPPV) : DP pin must be connected to DVDD with 1.5kΩ resistor.
    SHORT: Used to only short.<Default>

■ The function of the toggle SW

[SW2] (LMUTEN): Left channel mute switch. Keep pressing the button if mute is needed.
[SW3] (RMUTEN): Right channel mute switch. Keep pressing the button if mute is needed.

■ Indication for LED

[D1] (SUSN): Monitor SUSN pin of the AK5374. LED turns off when the AK5374 is on suspend state.
AK5374MAPPER.exe

1) General description
AK5374MAPPER.exe is a tool of creating a register setting file that is written to EEPROM on the AKD5374-A. The program can not only display register settings written from a register setting file, but also change the register settings directly.

2) Explanation of main window
When runs the program, the window as shown blow opens.

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Figure 10. AK5374MAPPER General Setting

A: The top menu can be switched by “TAB” key.

B: Click this button to open a register setting file(.txt), and display will be changed after reading the file.

C: Click this button to save the current register settings as a setting file which has a fixed name “AK5374_register.txt”.

D: Click this button to output a writing EEPROM file as a text file (.txt) which has a fixed name “AK5374_eeprom.txt”.

E: Click this button to output a writing EEPROM file as a binary file (.bin) which has a fixed name “AK5374_eeprom.bin”.

F: “Set All” button must be clicked after changing codes or values in edit boxes.
3) The setting of Alternate

Set up the register about Alternate here.

![AK5374MAPPER Alternate Setting](image)

Figure 11. AK5374MAPPER Alternate Setting

A: Choose available frequencies here. If any valid frequency is chosen, valid check mark will be made.

B: Choose initial frequency. Only available frequencies can be chosen.

About the AK5374’s descriptor setting, refer to datasheet of the AK5374.
4) The setting of register

![AK5374MAPPER Register Setting](image-url)

Figure 12. AK5374MAPPER Register Setting

A: Volume and hold time can be set up by clicking the “Set” button or pressing “ENTER” key after inputting numbers in edit boxes.

About the AK5374’s register setting, refer to datasheet of the AK5374.
5) Register setting file <Default>

```
#AK5374 Register
0x04 # [00H] Power Management
0x00 # [01H] Mic Gain Control
0x00 # [02H] Reserved
0x07 # [03H] PCM Format Alt1
0x04 # [04H] PCM Format Alt2
0x00 # [05H] PCM Format Alt3
0x00 # [06H] PCM Format Alt4
0x00 # [07H] PCM Format Alt5
0x00 # [08H] PCM Format Alt6
0x00 # [09H] PCM Format Alt7
0xFF # [0AH] Sampling Frequency Alt1
0xB1 # [0BH] Sampling Frequency Alt2
0x00 # [0CH] Sampling Frequency Alt3
0x00 # [0DH] Sampling Frequency Alt4
0x00 # [0EH] Sampling Frequency Alt5
0x00 # [0FH] Sampling Frequency Alt6
0x00 # [10H] Sampling Frequency Alt7
0x01 # [11H] Endpoint
0x00 # [12H] Initial Volume
0x02 # [13H] Min Volume
0x00 # [14H] Max Volume
0x00 # [15H] Mute Control 1
0x00 # [16H] Mute Control 2
0x00 # [17H] Reserved
0x00 # [18H] Reserved
0x00 # [19H] Reserved
0x00 # [1AH] Reserved
0x00 # [1BH] Reserved
0x00 # [1CH] Reserved
0x00 # [1DH] Reserved
0x00 # [1EH] Reserved
0x00 # [1FH] Reserved
```

Figure 13. Register Setting File (Text)
6) EEPROM Image File (Text output) <Default>

Figure 14. EEPROM Image File (Text)
EEPROM Write program for the AK5374: AK5374EEPROM.exe

1) Set up the jumper pins as the followings, and turn the SW1 to “L”.

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PC-EPAI</td>
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<td>PC-SK</td>
<td>PC-EPAO</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>EEP 5373</td>
</tr>
</tbody>
</table>

2) Connect USB2 Port of the AKD5374-A to PC with an USB cable. Windows recognizes the micro controller device automatically. Device manage shows “PICkit2 Microcontroller Programmer” in “Human Interface Devices” if Windows recognizes the device successfully.

Figure 15. Device Manger “Human Interface Devices”
3) Run the program “AK5374EEPROM.exe”.

![AK5374 EEPROM.exe window](image)

**Figure 16. AK5374 EEPROM.exe**

[Open]: Click this button to open a test file (.txt) or a binary file (.bin, .dat) and write it.
[Write]: Click this button to verify the file Written to EEPROM.
“Write complete” is displayed if the write succeeds, while “Verify failed” if not.
It takes only one second to write a file to EEPROM.

![Open dialog box](image)

![Write complete and Verify failed dialogs](image)

**Figure 17. AK5374 EEPROM Write**

4) Click “OK”, and the [EXIT] button of AK5374EEPROM.exe.
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<th>Board Revision</th>
<th>Reason</th>
<th>Page</th>
<th>Contents</th>
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<td></td>
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<td>KM101602</td>
<td>2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Change</td>
<td>1</td>
<td>AK65006CT → AK65008CT</td>
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<td></td>
<td></td>
<td>Change</td>
<td>2</td>
<td>SW3→SW1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Description Addition</td>
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<td></td>
<td>Description Addition</td>
<td>13</td>
<td>1) Explanation for “SW1” was added.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>Change</td>
<td>15</td>
<td>IMPORTANT NOTICE Changed.</td>
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</table>

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