

	<h1 style="margin: 0;">AKD4254-A</h1> <h2 style="margin: 0;">AK4254 Evaluation Board Rev.2</h2>
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**GENERAL DESCRIPTION**

AKD4254-A is an evaluation board for AK4254 that has 7:2 video switches. This board can achieve the interface with video systems via RCA connectors.

**■ Ordering guide**

- AKD4254-A --- AK4254 Evaluation Board
  - 10-wire flat cable for connection with printer port of PC (IBM-AT compatible machine), control software for AK4254, driver for control software on Windows 2000/XP are packed with this.
  - Control software does not work on Windows NT
  - Windows 2000/XP needs an installation of driver.
  - Windows 95/98/ME does not need an installation of driver.

**FUNCTION**

- RCA connectors for video signal: 7 inputs, 2 outputs
- 10-pin header for I<sup>2</sup>C/3-wire serial control

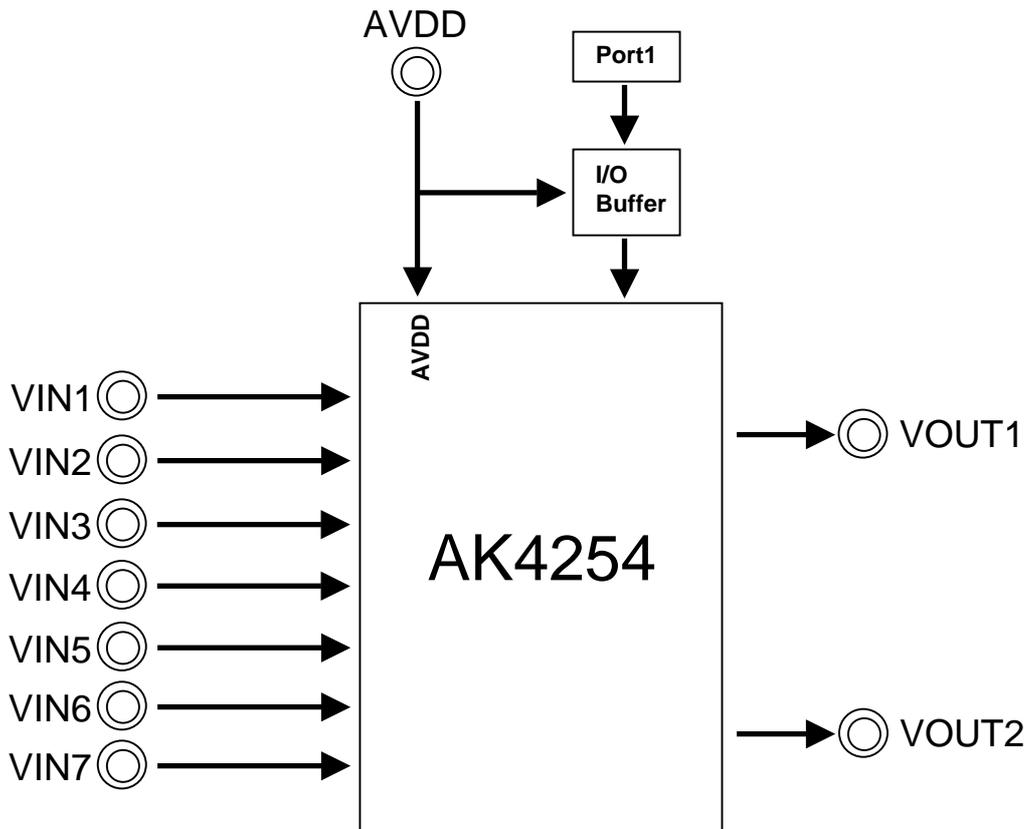


Figure 1. AKD4254-A Block Diagram  
 \* Circuit diagram and PCB layout are attached at the end of this manual.

**EVALUATION BOARD MANUAL**

■ **Operation sequence**

1) Set up power supply lines.

Name of jack	Color of jack	Voltage	Used for	Open / connect	Default Setting
AVDD	Red	+3.0V	AVDD of AK4254 and Digital Logic	Should be always connected.	+3V
AGND	Black	0V	Analog Ground	Should be always connected.	0V

Table 1. Set up the power supply lines

(Note) Each supply line should be distributed from the power supply unit.

2) Set-up jumper pins and DIP switches. (See the followings.)

3) Power on.

AK4254 should be reset once bringing SW1 (PDN) to “L” upon power-up.

■ **Evaluation Mode**

AKD4254-A can evaluate AK4254 by the following mode.

- [1] Parallel Mode
- [2] Serial Mode (3-wire)
- [3] Serial Mode (I<sup>2</sup>C)

[1] **Parallel Mode**

(1-1) Set up jumper pins [JP3, JP4]



(1-2) Set up DIP Switches [SW2]

Pin No. [SW2]	Pin Name	ON (“H”, “1”) / OFF (“L”, “0”)
1	SEL10	Input Select of VOUT1
2	SEL11	Input Select of VOUT1
3	SEL12	Input Select of VOUT1
4	SEL20	Input Select of VOUT2
5	SEL21	Input Select of VOUT2
6	SEL22	Input Select of VOUT2
7	P/S	ON (“H”)

Table 2. Set up DIP Switches for Parallel Mode

**[2] Serial Mode (3-wire)**

(1-1) Set up jumper pins [JP3, JP4]



(1-2) Set up DIP Switches [SW2]

Pin No. [SW2]	Pin Name	ON (“H”, “1”) / OFF (“L”, “0”)
1	CAD0	Chip Address Select (Note1)
2	CAD1	Chip Address Select (Note1)
3	---	“Don’t Care”
4	---	“Don’t Care”
5	---	“Don’t Care”
6	I2C	OFF (“L”)
7	P/S	OFF (“L”)

Table 3. Set up DIP Switches for Serial Mode (3-wire)

(Note1) Chip Address is selected by CAD1, CAD0 pin

**[3] Serial Mode (I<sup>2</sup>C)**

(1-1) Set up jumper pins [JP3, JP4]



(1-2) Set up DIP Switches [SW2]

Pin No. [SW2]	Pin Name	ON (“H”, “1”) / OFF (“L”, “0”)
1	CAD0	Chip Address Select (Note1)
2	CAD1	Chip Address Select (Note1)
3	---	“Don’t Care”
4	---	“Don’t Care”
5	---	“Don’t Care”
6	I2C	ON (“H”)
7	P/S	OFF (“L”)

Table 4. Set up DIP Switches for Serial Mode (I<sup>2</sup>C)

(Note1) Chip Address is selected by CAD1, CAD0 pin

**■ Set up jumper pins**

1. JP1 (GND) : Analog ground and Digital ground  
 OPEN : Separated.  
 SHORT : Common. (The connector “DGND” can be open.) <Default>
  
2. JP5 (AVDD(D-A)):AVDD and D3.3V\_IN(Digital Logic power supply)  
 OPEN : Separated.  
 SHORT : Common. (JP5 should be “SHORT”.) <Default>

■ **The function of the toggle SW**

[SW1] (PDN) : Resets the AK4254. Keep “H” during normal operation.

■ **Set up DIP switch**

[SW2-8] (TEST) : Set up TEST-pin. Keep “H” during normal operation.

■ **Serial Control**

The AK4254 can be controlled via the printer port (parallel port) of IBM-AT compatible PC. Connect printer port (parallel port) of PC and PORT1 (CTRL) of AKD4254-A by 10-wire flat cable (packed with AKD4254-A). Take care of the direction of 10-pin connector and 10-pin header.

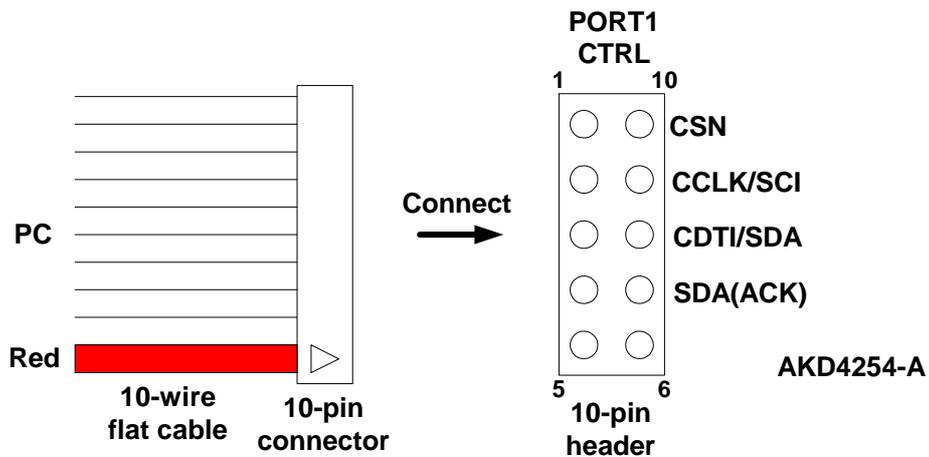


Figure 2. 10-wire flat cable, 10-pin connector, and 10-pin header

■ Input / Output circuit

(1) Video Input Circuit

VIN1~VIN7 Input circuits

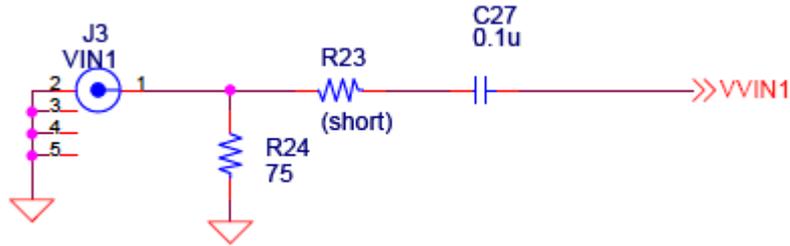


Figure 3. VIN Input circuit

(2) Video Output Circuit

VOUT1, VOUT2 Output circuits

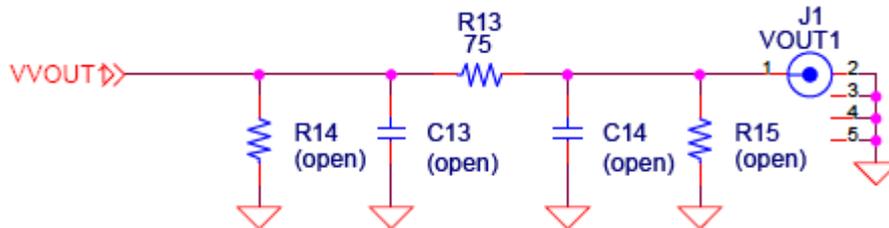


Figure 4. VOUT1 Output circuit

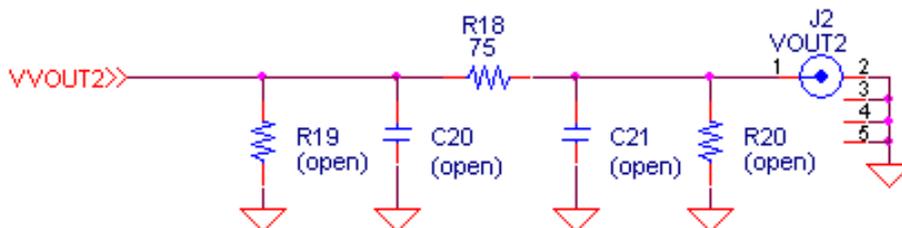


Figure 5. VOUT2 Output circuit

## Control Software Manual

### ■ Set-up of evaluation board and control software

1. Set up the AKD4254-A according to previous term.
2. Connect IBM-AT compatible PC with AKD4254-A by 10-line type flat cable (packed with AKD4254-A). Take care of the direction of 10pin header. (Please install the driver in the CD-ROM when this control software is used on Windows 2000/XP. Please refer “Installation Manual of Control Software Driver by AKM device control software”. In case of Windows95/98/ME, this installation is not needed. This control software does not operate on Windows NT.)
3. Insert the CD-ROM labeled “AKD4254-A Evaluation Kit” into the CD-ROM drive.
4. Access the CD-ROM drive and double-click the icon of “akd4254-a.exe” to set up the control program.
5. Then please evaluate according to the follows.

### ■ Operation flow

Keep the following flow.

1. Set up the control program according to explanation above.
2. Click “Port Reset” button.

### ■ Explanation of each buttons

1. [Port Reset]: Set up the USB interface board (AKDUSBIF-A).
2. [Write default]: Initialize the register of AK4254.
3. [All Write]: Write all registers that is currently displayed.
4. [Function1]: Dialog to write data by keyboard operation.
5. [Function3]: The sequence of register setting can be set and executed.
6. [Function4]: The sequence that is created on [Function3] can be assigned to buttons and executed.
7. [Function5]: The register setting that is created by [SAVE] function on main window can be assigned to buttons and executed.
8. [SAVE]: Save the current register setting.
9. [OPEN]: Write the saved values to all register.
10. [Write]: Dialog to write data by mouse operation.

### ■ Indication of data

Input data is indicated on the register map. Red letter indicates “H” or “1” and blue one indicates “L” or “0”. Blank is the part that is not defined in the datasheet.

## ■ Explanation of each dialog

### 1. [Write Dialog]: Dialog to write data by mouse operation

There are dialogs corresponding to each register.

Click the [Write] button corresponding to each register to set up the dialog. If you check the check box, data becomes "H" or "1". If not, "L" or "0".

When writing the input data to AK4254, click [OK] button. If not, click [Cancel] button.

### 2. [Function1 Dialog]: Dialog to write data by keyboard operation

Address Box: Input registers address in 2 figures of hexadecimal.

Data Box: Input registers data in 2 figures of hexadecimal.

When writing the input data to AK4254, click [OK] button. If not, click [Cancel] button.

### 3. [Save] and [Open]

#### 3-1. [Save]

Save the current register setting data. The extension of file name is "akr".

(Operation flow)

Click [Save] Button.

Set the file name and push [Save] Button. The extension of file name is "akr".

#### 3-2. [Open]

The register setting data saved by [Save] is written to AK4254. The file type is the same as [Save].

(Operation flow)

(1) Click [Open] Button.

(2) Select the file (\*.akr) and Click [Open] Button.

**4. [Function3 Dialog]**

The sequence of register setting can be set and executed.

(1) Click [F3] Button.

(2) Set the control sequence.

Set the address, Data and Interval time. Set “-1” to the address of the step where the sequence should be paused.

(3) Click [Start] button. Then this sequence is executed.

The sequence is paused at the step of Interval="-1". Click [START] button, the sequence restarts from the paused step.

This sequence can be saved and opened by [Save] and [Open] button on the [Function3] window. The extension of file name is “aks”.

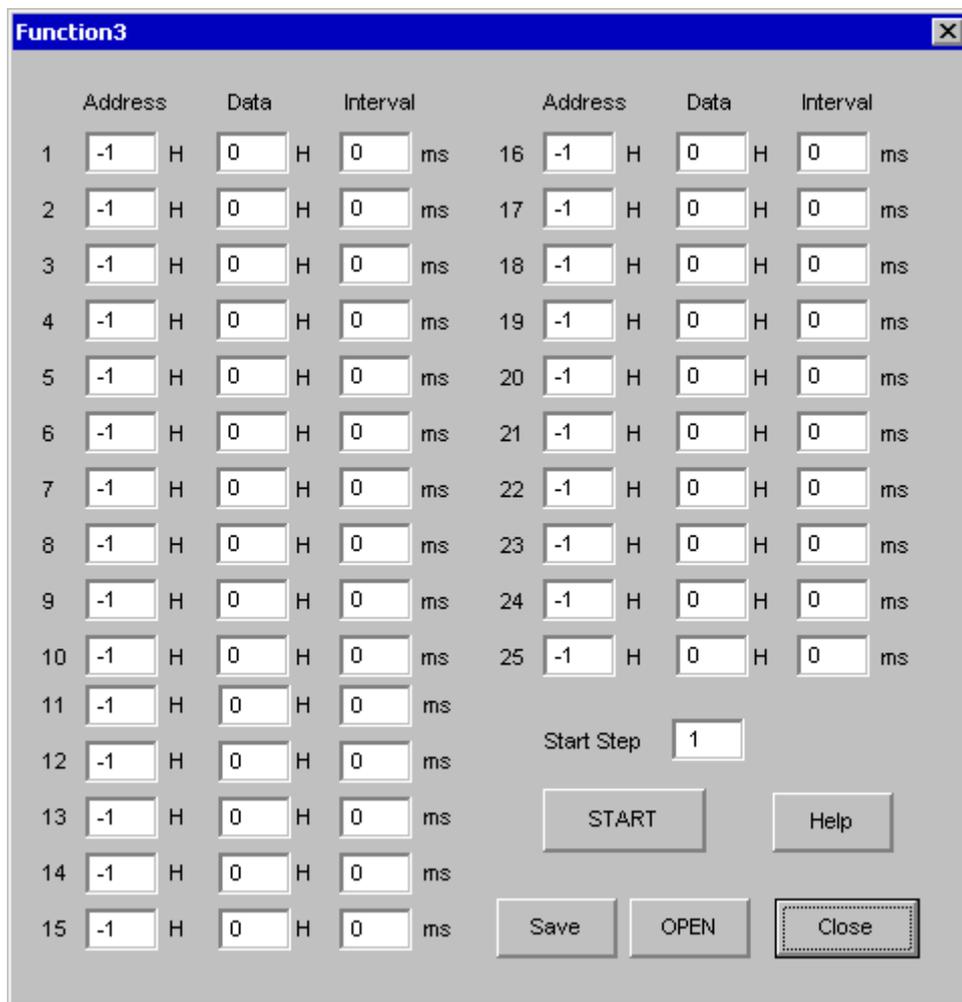


Figure 1. Window of [F3]

### 5. [Function4 Dialog]

The sequence that is created on [Function3] can be assigned to buttons and executed. When [F4] button is clicked, the window as shown in **Figure 2** opens.

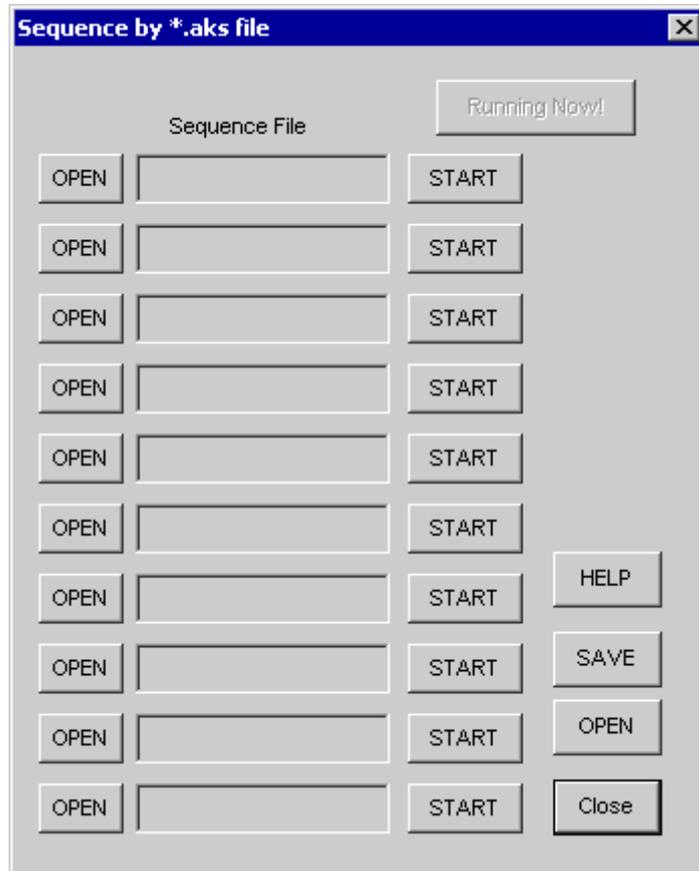


Figure 2. [F4] window

### 5-1. [OPEN] buttons on left side and [START] buttons

(1) Click [OPEN] button and select the sequence file (\*.aks).

The sequence file name is displayed as shown in Figure 3.

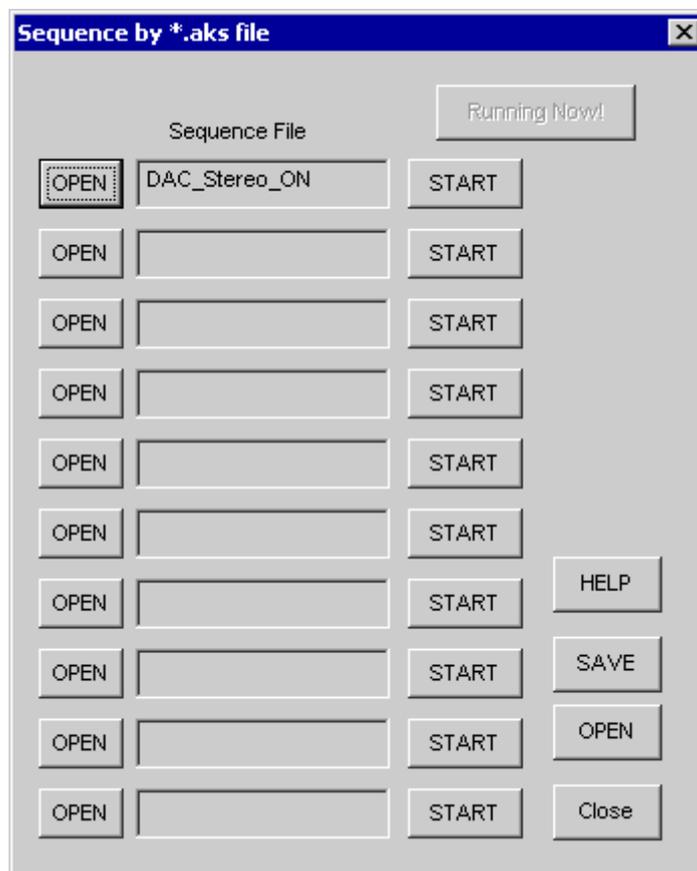


Figure 3. [F4] window(2)

(2) Click [START] button, then the sequence is executed.

### 5-2. [SAVE] and [OPEN] buttons on right side

[SAVE]: The sequence file names can assign be saved. The file name is \*.ak4.

[OPEN]: The sequence file names assign that are saved in \*.ak4 are loaded.

### 5-3. Note

- (1) [Function4] doesn't support the pause function of sequence function.
- (2) All files need to be in same folder used by [SAVE] and [OPEN] function on right side.
- (3) When the sequence is changed in [Function3], the file should be loaded again in order to reflect the change.

## 6. [Function5 Dialog]

The register setting that is created by [SAVE] function on main window can be assigned to buttons and executed. When [F5] button is clicked, the following window as shown in **Figure 4** opens.

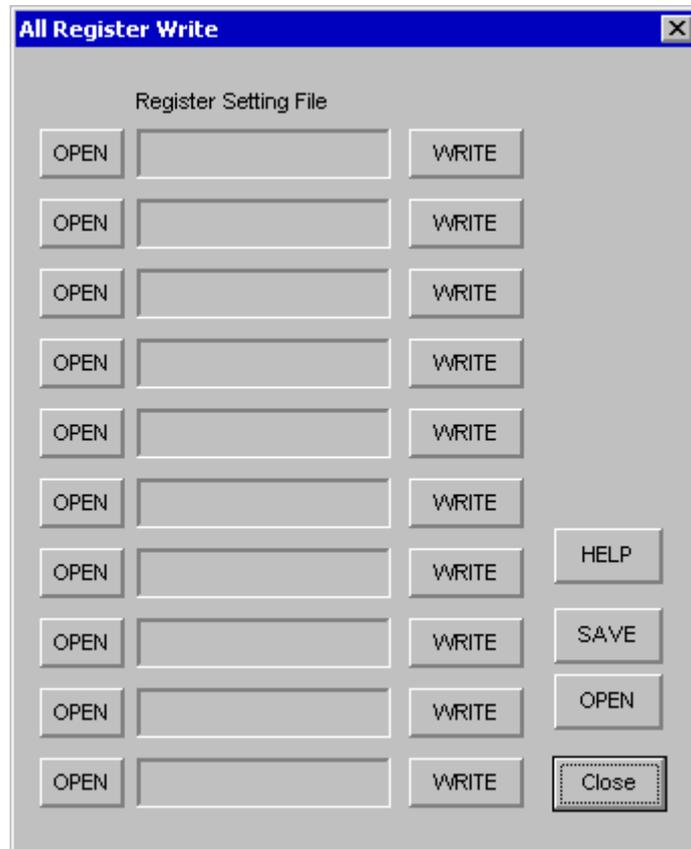


Figure 4. [F5] window

### 6-1. [OPEN] buttons on left side and [WRITE] button

- (1) Click [OPEN] button and select the register setting file (\*.akr).
- (2) Click [WRITE] button, then the register setting is executed.

### 6-2. [SAVE] and [OPEN] buttons on right side

[SAVE]: The register setting file names assign can be saved. The file name is \*.ak5.

[OPEN]: The register setting file names assign that are saved in \*.ak5 are loaded.

### 6-3. Note

- (1) All files need to be in same folder used by [SAVE] and [OPEN] function on right side.
- (2) When the register setting is changed by [Save] Button in main window, the file should be loaded again in order to reflect the change.

<b>MEASUREMENT RESULTS</b>
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### ■ Video

[Measurement condition]

- Signal Generator : Sony Tectonics TG2000
- Measurement unit : Sony Tectonics VM700T
- Power Supply : AVDD=3V
- Temperature : Room
- Measurement signal line path : VIN1 → VOUT1

Parameter	Measurement conditions	Results	Unit
S/N	Input = 0% flat field BW= 100kHz to 6MHz	68.8	dB
Crosstalk	Input = 100%Red(PAL), Measured at VOUT1	70.4	dB
DG	Input = Modulated 5 Step	min. 0.00 max. 0.77	%
DP	Input = Modulated 5 Step	min. 0.00 max. 1.84	deg.

### Plots

Figure 1-1. Noise spectrum (Input=0% flat field, BW=100kHz to 6MHz)

Figure 1-2 Crosstalk (Input= 100% red composite (VIN1), measured at VOUT1)

Figure 1-3 Crosstalk (Input= 100% red Y-Signal (VIN2), measured at VOUT1)

Figure 1-4 DG, DP (Input= Modulated 5 Step)

Plots(Video)

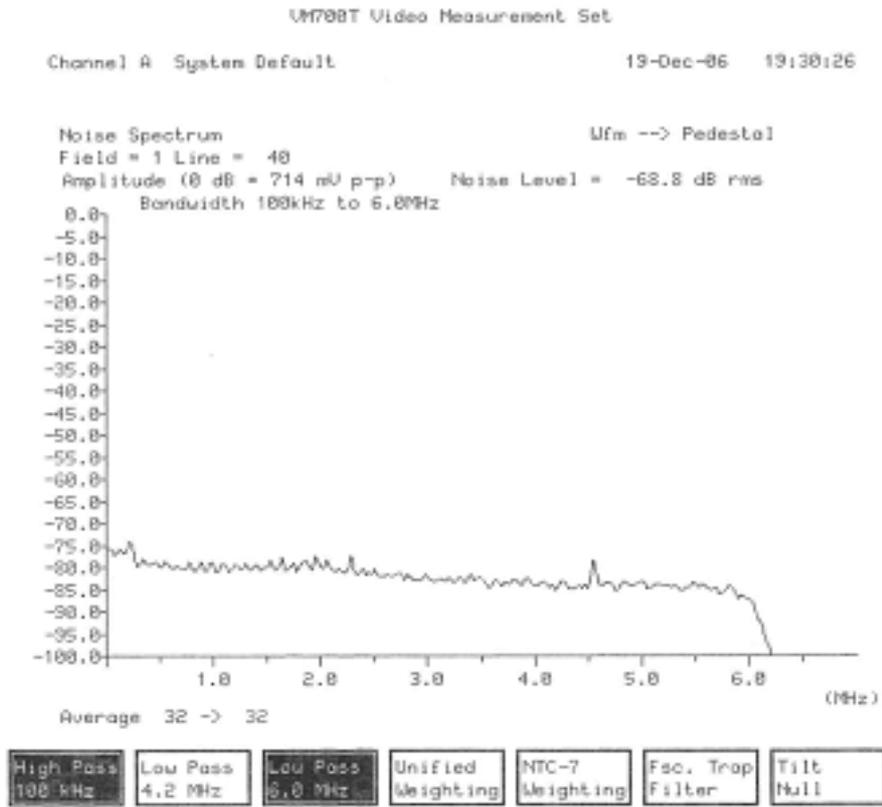


Figure 1-1. Noise spectrum (Input=0%flat field, BW=100kHz to 6MHz)

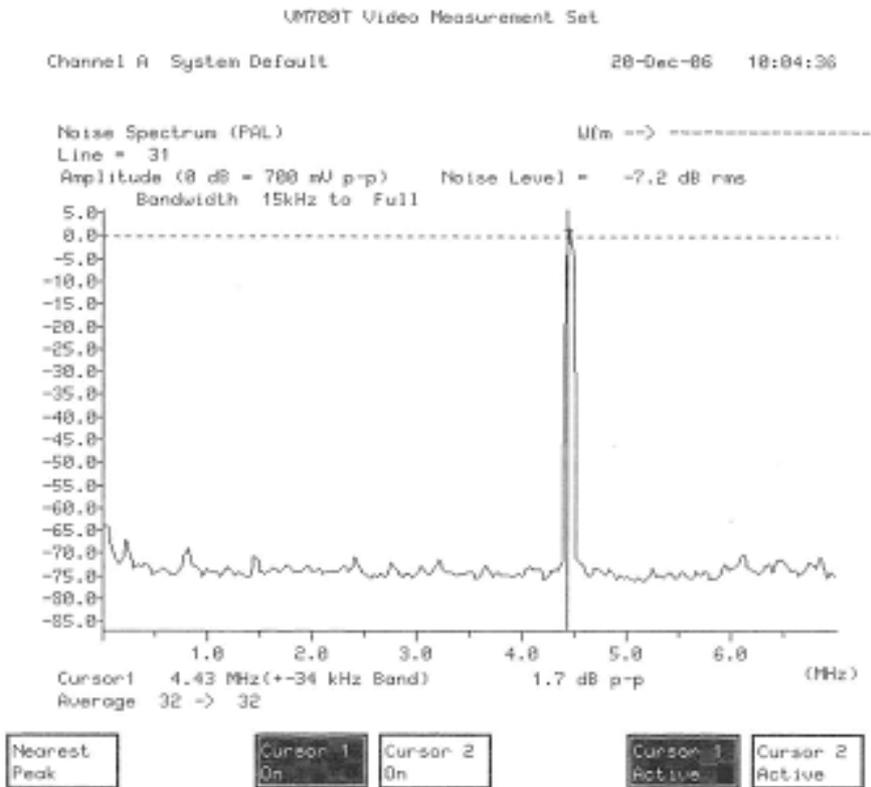


Figure 1-2 Crosstalk (Input= 100% red composite (VIN1), measured at VOUT1)

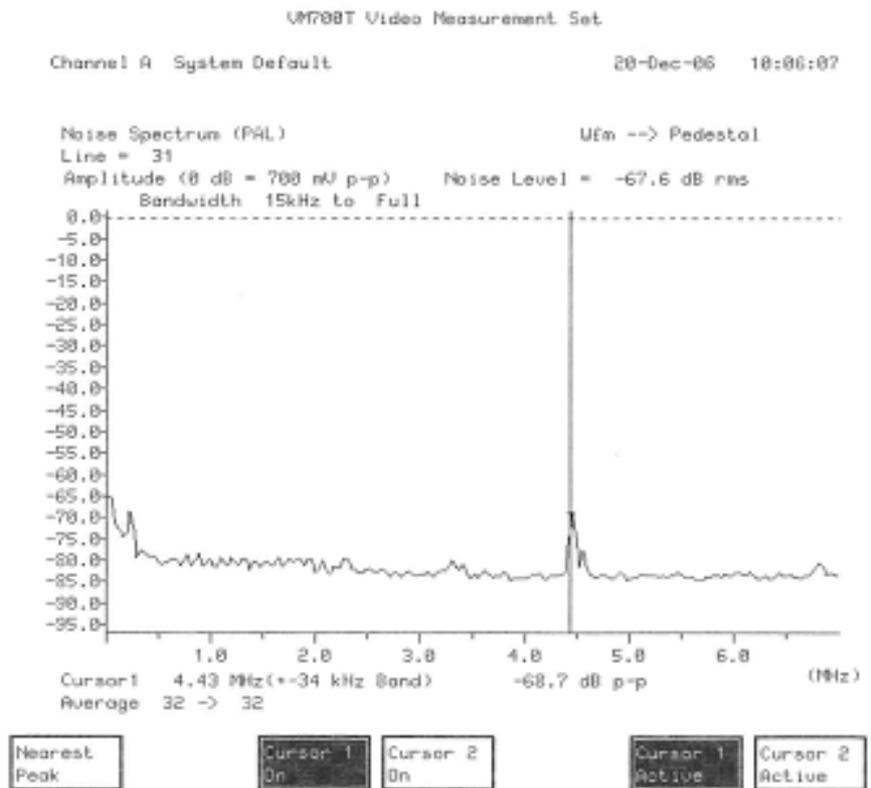


Figure 1-3 Crosstalk (Input= 100% red Y-Signal (VIN2), measured at VOUT1)

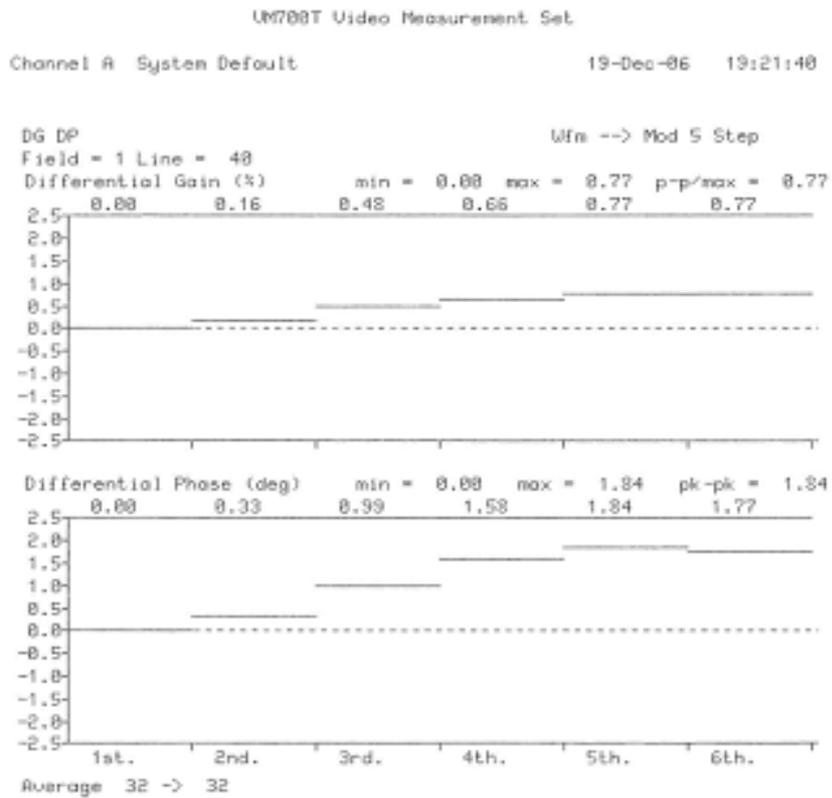


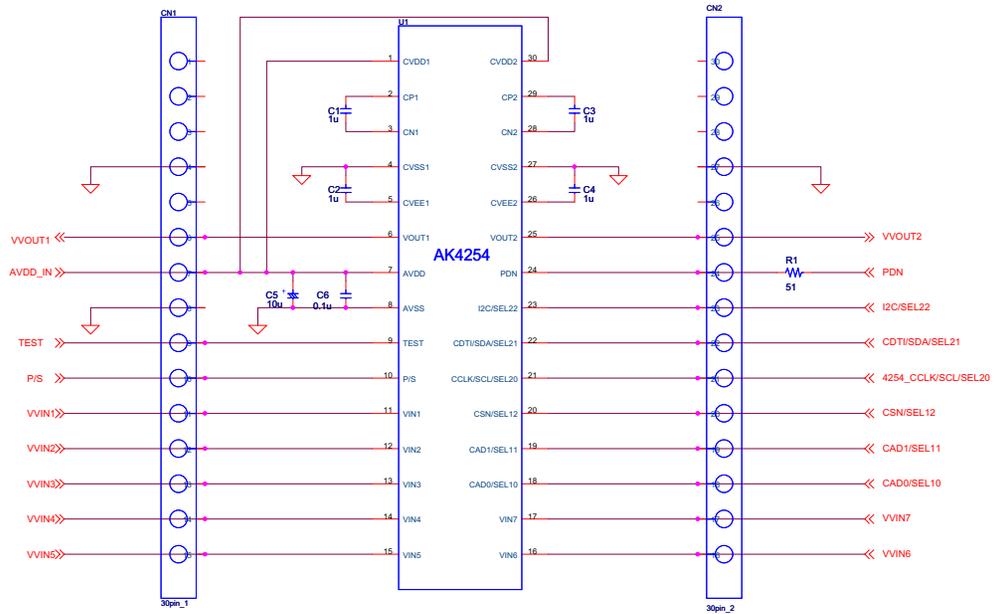
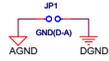
Figure 1-4 DG, DP (Input= Modulated 5 Step)

<b>Revision History</b>
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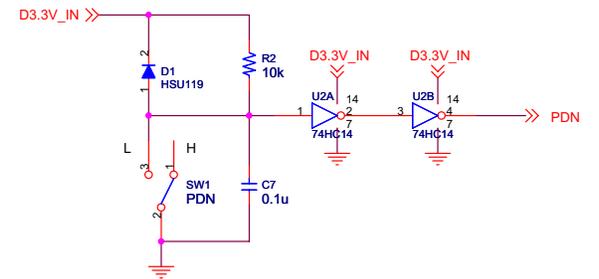
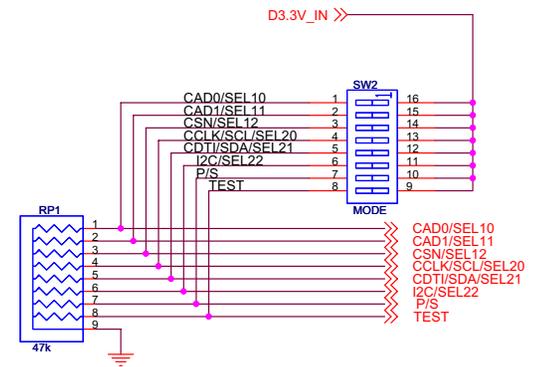
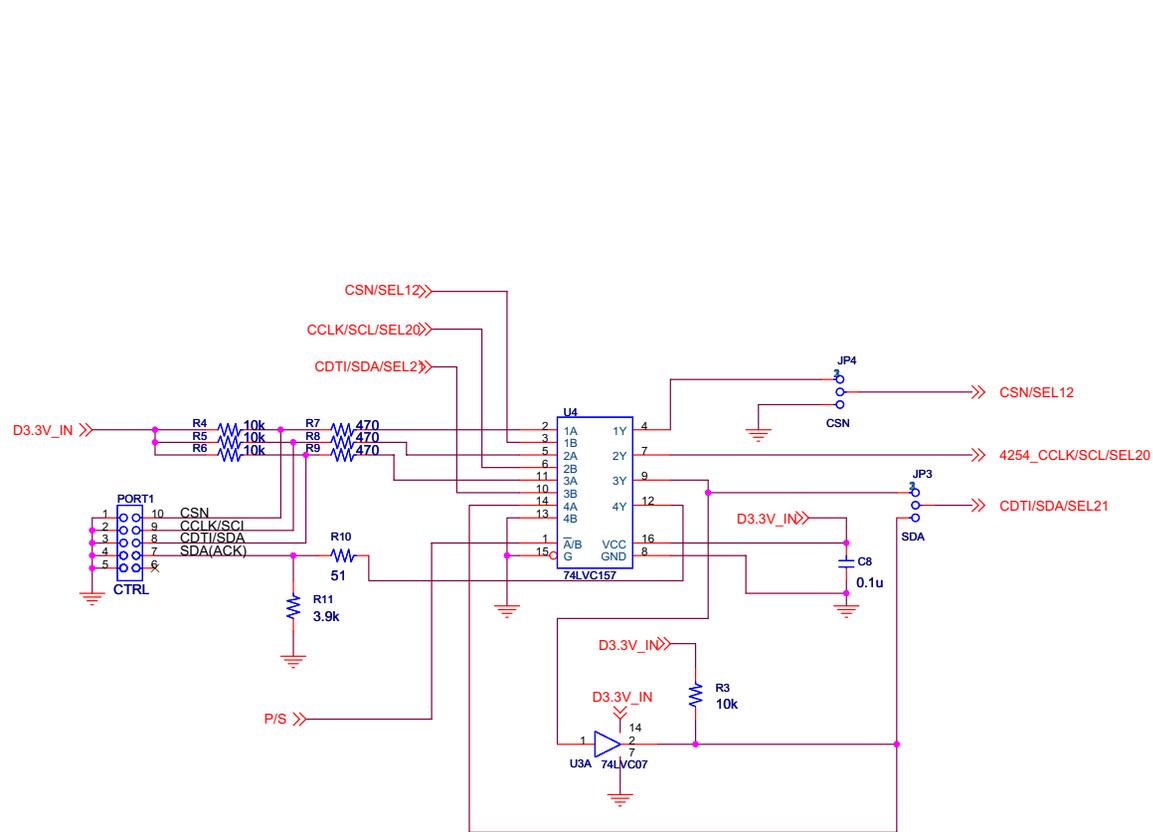
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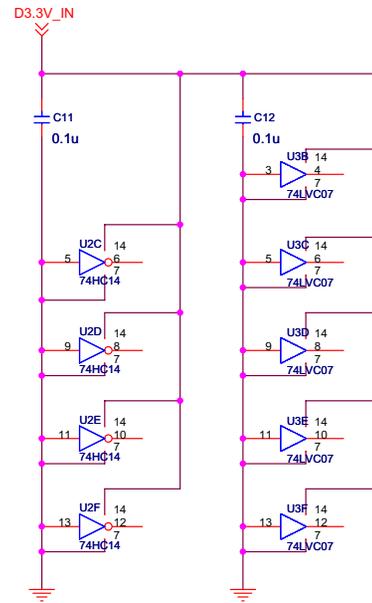
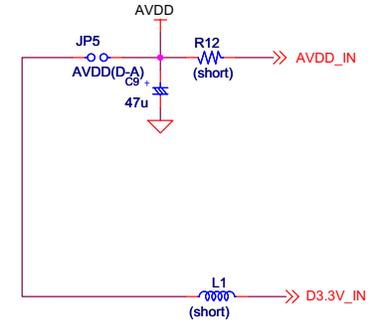
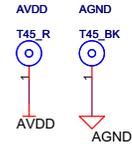
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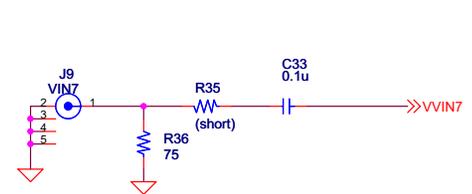
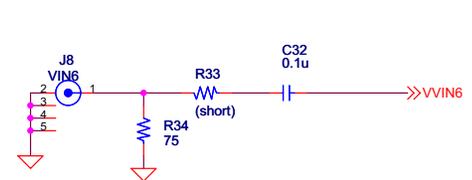
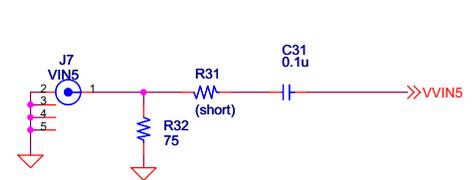
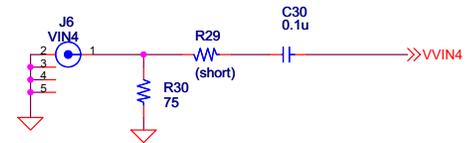
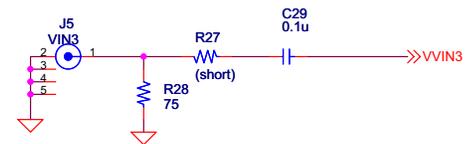
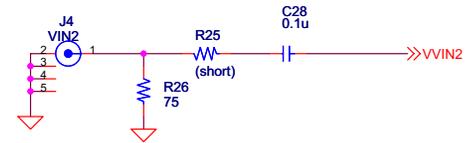
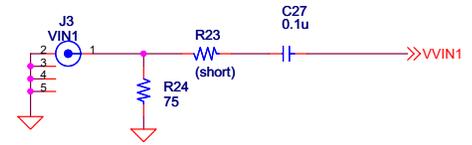
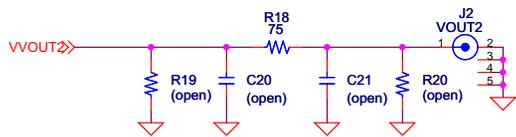
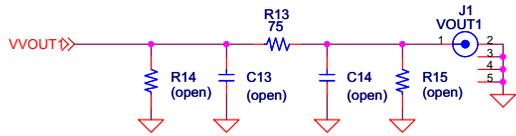
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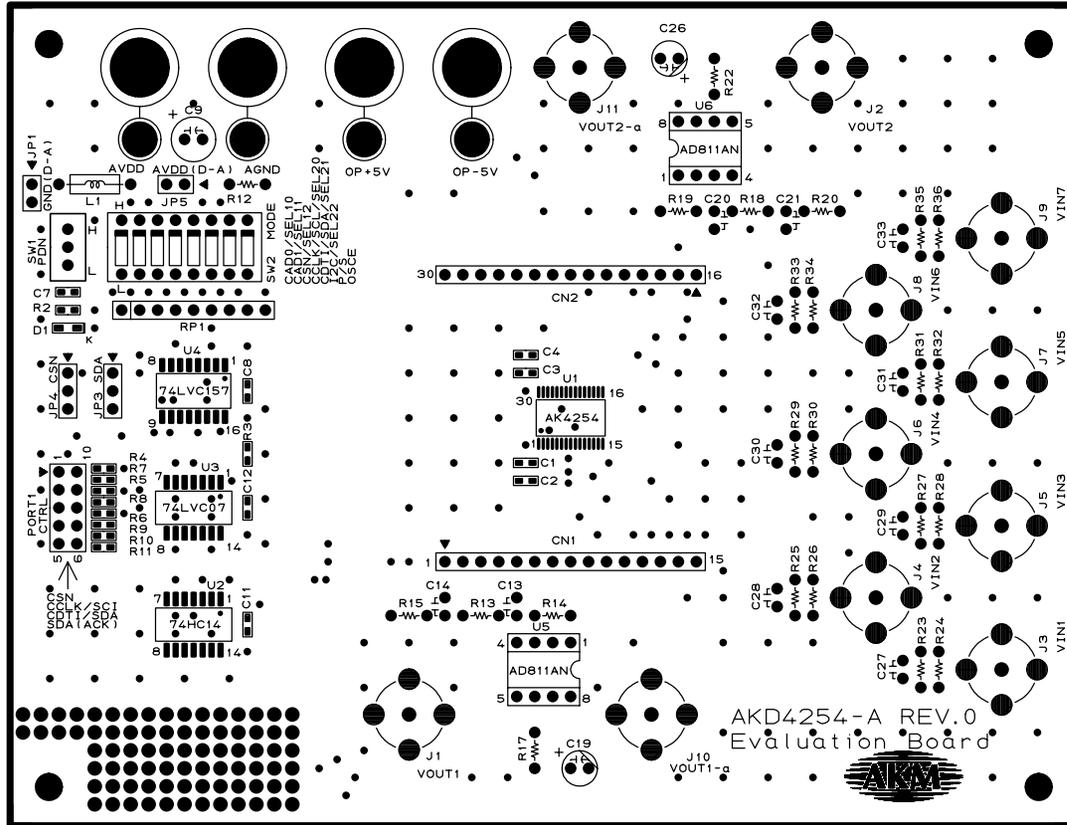
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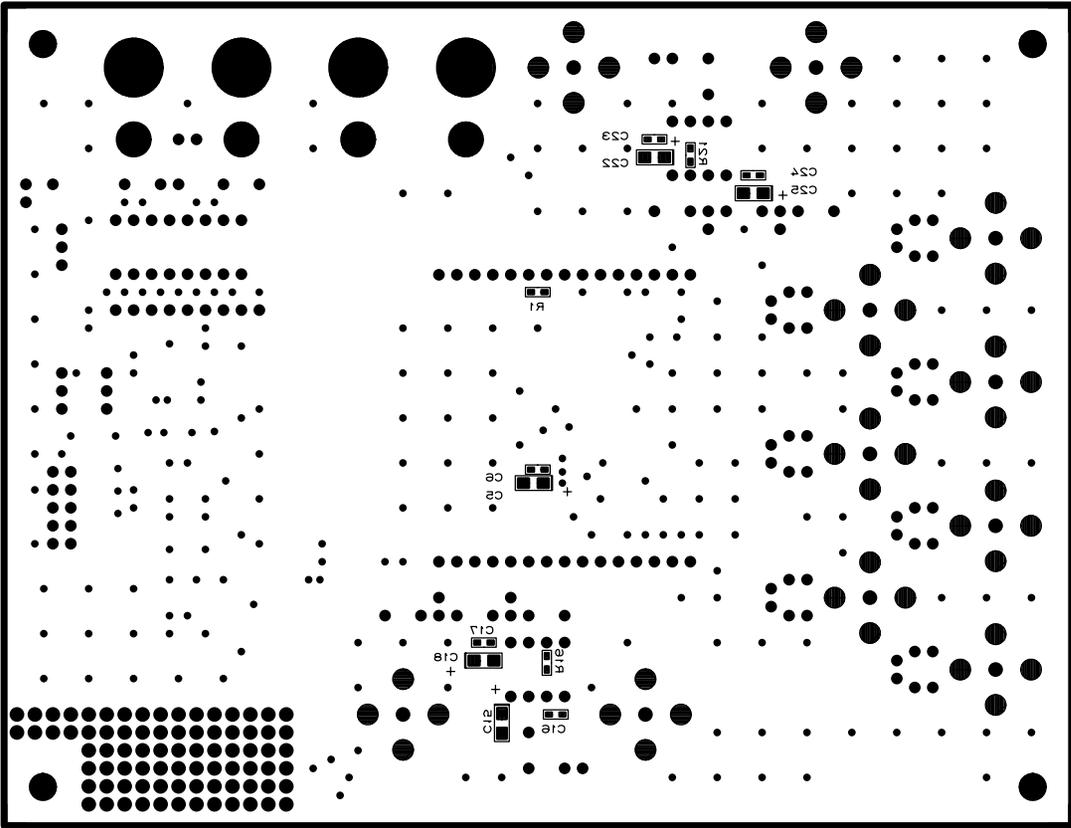
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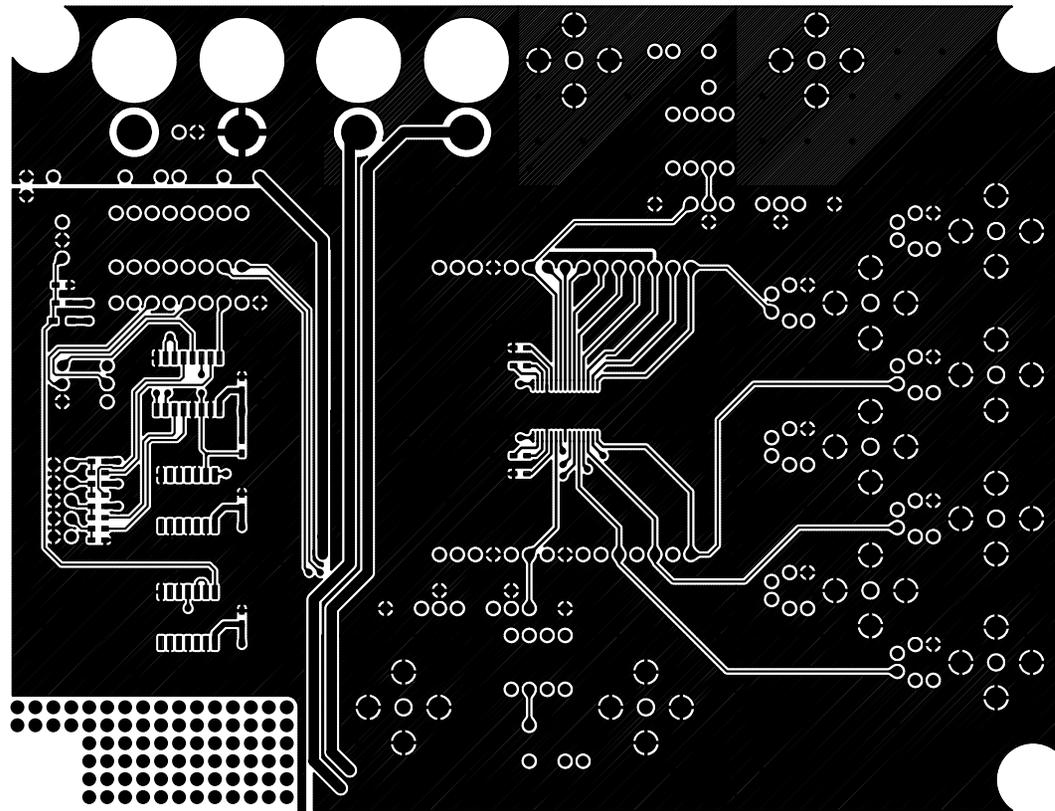
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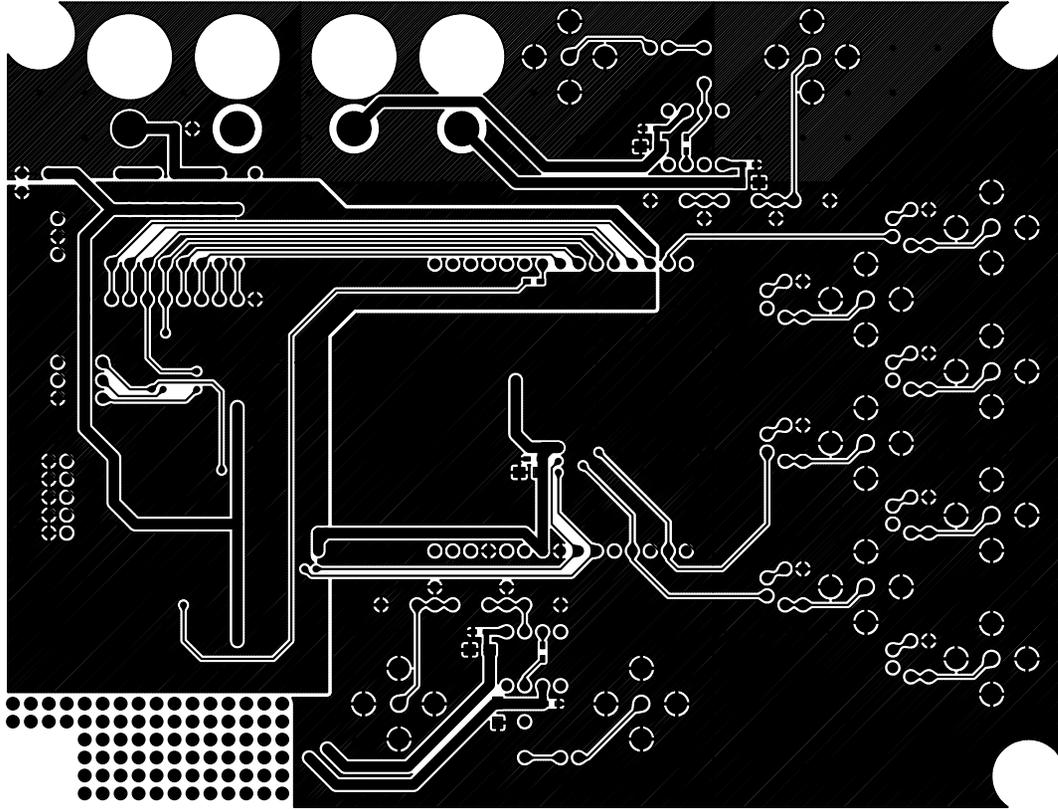
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AKD4254-A L1



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