



AKD4626A-B

AK4626A Evaluation board Rev.0

GENERAL DESCRIPTION

The AKD4626A-B is an evaluation board for the AK4626A, the Multi-channel Audio CODEC. The AKD4626A-B also has the digital audio interface and can achieve the interface with digital audio systems via opt-connector or BNC connector.

■ Ordering guide

AKD4626A-B --- AK4626A Evaluation board Rev.0
 (Cable for connecting with printer port of IBM-AT compatible PC and control software are packed with this.)

FUNCTION

- On-board analog input buffer circuit
- Compatible with 2 types of interface
 - DIT(AK4103A)/DIR(AK4112B) with optical output/input and BNC input
 - Direct interface with AC3 decoder by 10pin header
- 10pin header for serial control interface

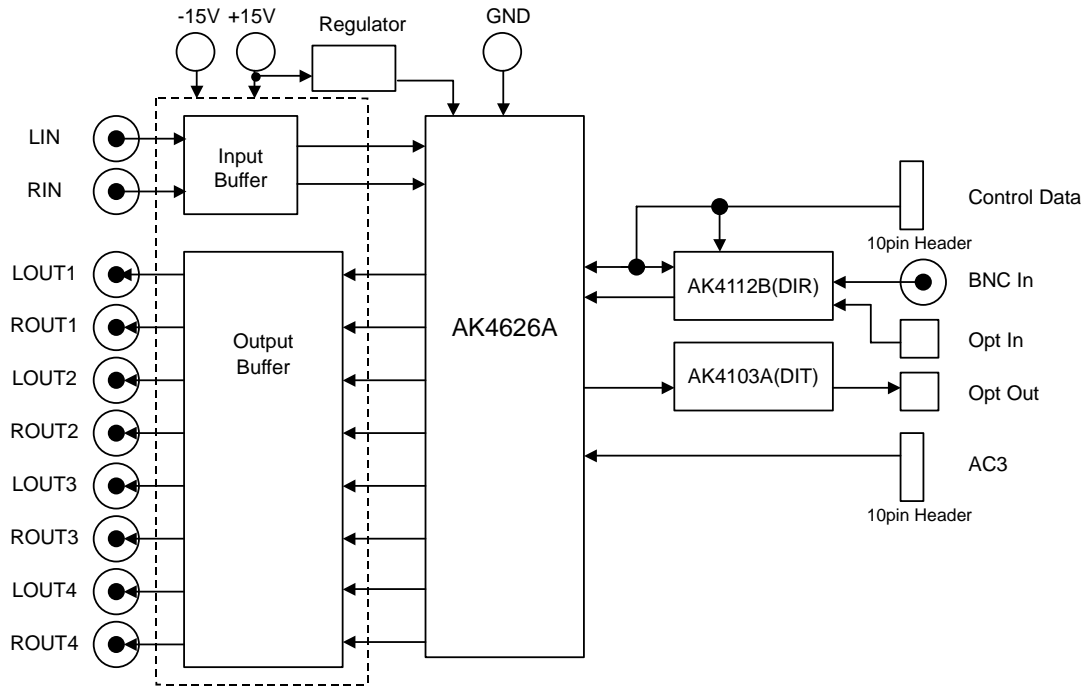


Fig 1. AKD4626A-B Block Diagram

*Circuit diagram and PCB layout are attached at the end of this manual.

■ Operation sequence

(1) Set up the power supply lines.

[+12V]	(orange jack)	= +12 ~ +15V
[-12V]	(blue jack)	= -12 ~ -15V
[AGND]	(black jack)	= 0V
[DGND]	(black jack)	= 0V

Each supply line should be distributed from the power supply unit.

±12V are supplied to analog interface.

+12V is regulated to +5V and +3.3V by regulators(T1,T2).

+5V is supplied to digital interface, AK4626A and TVDD of AK4112B.

+3.3V is supplied to AVDD and DVDD of AK4112B and TVDD of AK4626A.

(2) Set up the evaluation mode and jumper pins. (See p.6.)

(3) Power on.

The AK4626A, AK4112B and AK4103A should be reset once bringing PDN(SW1) "L" upon power-up.

(4) Set up software.

The control mode of AK4626A and AK4112B is fixed to "serial".

The AKD4626A-B can be controlled via the printer port (parallel port) of IBM-AT compatible PC. Connect PORT1(uP-I/F) with PC by 10-line flat cable packed with the AKD4626A-B.

Take care of the direction of connector. There is a mark at pin#1.

The pin layout of PORT1 is as Figure 2.

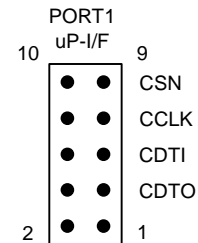


Figure 2. PORT1 pin layout

■ Evaluation mode

1) Evaluation of ADC

TOTX176 is used for digital output. Clock mode of the AK4112B should be set to PLL mode or X'tal mode.

2) Evaluation of DAC

TORX176 or BNC is used for digital input. Clock mode of the AK4112B should be set to PLL mode. "4112A" should be selected on JP4,5,6 and 7.

3) Loopback mode

Clock mode of the AK4112B should be set to PLL mode or X'tal mode. "4112A" should be selected on JP4,5,6 and 7.

4) Evaluation of DAC using DSP

"DSP" should be selected on JP4,5,6 and 7.

Evaluation mode	AK4112B clock set-up	JP4,5,6,7	Used I/F
ADC	CM1= "0", CM0= "1"(X'tal mode)	SHORT	TOTX176 optical output
DAC	CM1= "0", CM0= "0"(PLL mode)	SHORT	
Loopback	CM1= "0", CM0= "1"(X'tal mode)	SHORT	
Using DSP	CM1= "0", CM0= "0"(PLL mode)	OPEN	PORT5(10-pin Header)

(Note.)1. Software "4112.exe" packed with the AKD4626A-B is used for set-up of the AK4112B.

2. CM1 and CM0 bits are D5 and D4 of Addr=00H, respectively

Table 2.Evaluation mode

■ DIP Switch set up. (See the datasheet of AK4626A and AK4103A)

1. DFS_4529(SW2-1) set up of AK4626A Sampling speed(fs).

DFS_4529	Sampling Speed (fs)		Default
OFF	Normal Speed Mode	32kHz~48kHz	
ON	Double Speed Mode	64kHz~96kHz	

Table 3. Set up of Sampling Speed (fs)

2. V(SW2-2) set up of for AK4103A Validity detect.

V	Validity	Default
OFF	Valid	
ON	Invalid	

Table 4. Set up of Validity

3. FS3(SW2-3) FS2(SW2-4) set up of AK4103A sampling frequency setting.

FS3	FS2	Sampling frequency setting	Default
OFF	OFF	44.1kHz	
OFF	ON	48kHz	
ON	OFF	Reserved	
ON	ON	32kHz	

Table 5. Set up of sampling frequency setting

4. CKS1(SW2-5) set up of AK4103A System Clock .

CKS1	MCLK	fs	Default
OFF	256fs	28k-108kHz	
ON	512fs	28k-54kz	

Table 6.Set up of System Clock

5. DIF0(SW2-6) set up of AK4103A Audio Serial Interface Format.

DIF0	Audio Serial Interface Format	LRCK	BICK	Default
OFF	24bit, Left justified	H/L	48fs-128fs	
ON	24bit, I ² S	L/H	48fs-128fs	

Table 7. Set up of Audio Serial Interface Format

■ Jumper pin set up

[JP1] <GND> (open) ---Analog GND and Digital GND

[JP4,5,7] (SDTI1,2,3) --- AK4626A SDTI1,2,3 input source select
 <DSP> (open) : Serial Data is input from DSP via PORT4.
 <4112A> (short) : Serial Data is input from AK4112B SDTO. <default>

[JP3] (V/TX) --- AK4112B V/TX output select.
 <V> : Validity. <default>
 <TX> : Transmit channel (through data)

[JP2](OPT/COAX) --- The source of the biphase signal input to the AK4112B
 <OPT_IN> : Optical input to RX1 of AK4112B <default>
 <RX2> : BNC input to RX1 of AK4112B

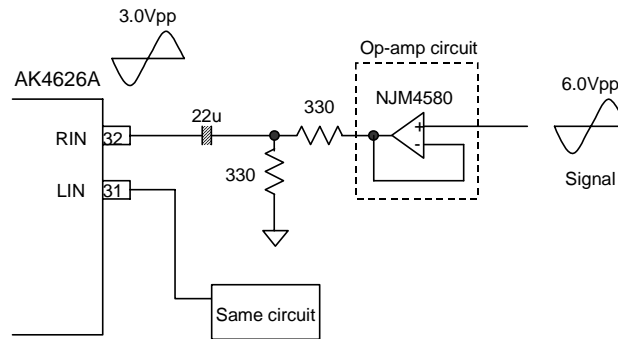
■ The function of the toggle SW.

[SW1] : Resets the AK4626A, AK4112B and AK4103A. Keep “H” during normal operation.

■ The indication content for LED.

[LE1] (DZF1) : Zero detection
 [LE2] (DZF2_OVF) : Zero detection or Overflow Detection
 [LE3] (ERF) : AK4112B unlock and parity error output.
 [LE4] (FS96) : AK4112B 96kHz sampling detect.
 [LE5] (AUTO) : AK4112B AC-3/MPEG detect.
 [LE6] (V) : AK4112B Validity detect

■ Consideration for analog input circuit



1) Gain

Gain of analog input circuit is
 $330/(330+330) = -6.02\text{dB}$.
 Therefore input level for this board is
 $+0.51\text{dBV}(=3.0\text{Vpp})+6.02\text{dB}$
 $= +6.53\text{dBV} = 6.00\text{Vpp} = 2.12\text{Vrms}$.

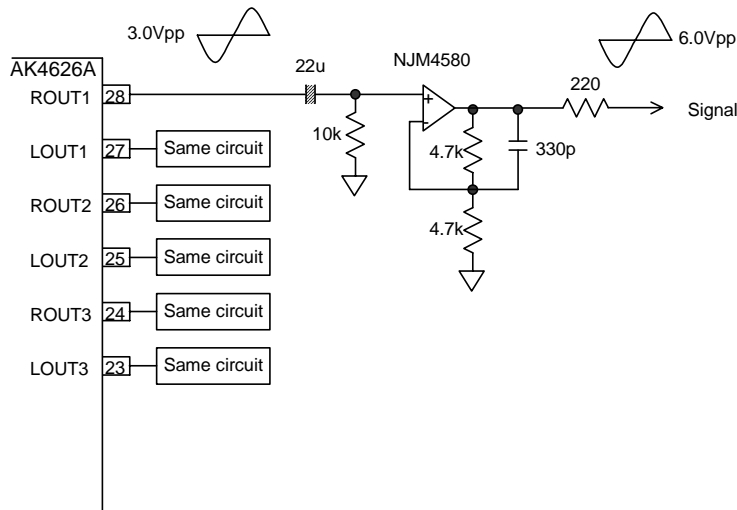
2) S/N of op-amp circuit (Theory: $BW=20k+A$)

Non-inverting amp is implemented on board. The output noise level of op-amp circuit is
 $-126.01\text{dBV} = -132.54\text{dB} (0\text{dB}=+6.53\text{dBV})$.

S/N of ADC is
 103.6dB (measurement).

Therefore total S/N of op-amp circuit and ADC is
 103.59dB (measurement: 103.6dB).

■ Consideration for analog output circuit



1) Frequency response of HPF

The HPF is implemented on board to cancel the DC offset of analog output of AK4626A.

Frequency response of 1st-order HPF

$$| \text{Amplitude} |^2 = 1 / \{ 1 + (fc/f)^2 \}; \quad fc = 1 / 2\pi RC = \mathbf{0.7Hz} @ R=10k, C=22u$$

fin	20Hz
Frequency Response	-0.006dB

2) Gain, S/N and frequency response of op-amp circuit

1st-order filter with non-inverting amp is implemented on board to double the analog output level and attenuate out-of-band noise.

a) Gain

The gain is

$$1 + 4.7k / 4.7k = +6.02dB.$$

Therefore the output level of this board is

$$0.51dBV (= 3.0Vpp) + 6.02dB \\ = \mathbf{6.53dBV = 6.00Vpp = 2.12Vrms.}$$

b) S/N (Theory: BW=20k+A)

The output noise level of non-inverting amp

$$-110.36dBV = -116.89dB \quad (0dB=6.53dBV)$$

S/N of DAC is

$$106.3dB \quad (\text{measurement})$$

Therefore total S/N of op-amp circuit and DAC is

$$\mathbf{105.94dB} \quad (\text{measurement: } 106.1dB).$$

c) Frequency response of filter

Frequency response of the 1st-order filter

$$| \text{Amplitude} |^2 = K * \{ 1 + (f/fc_2)^2 \} / \{ 1 + (f/fc_1)^2 \};$$

$$K = 1 + 4.7k / 4.7k = 2,$$

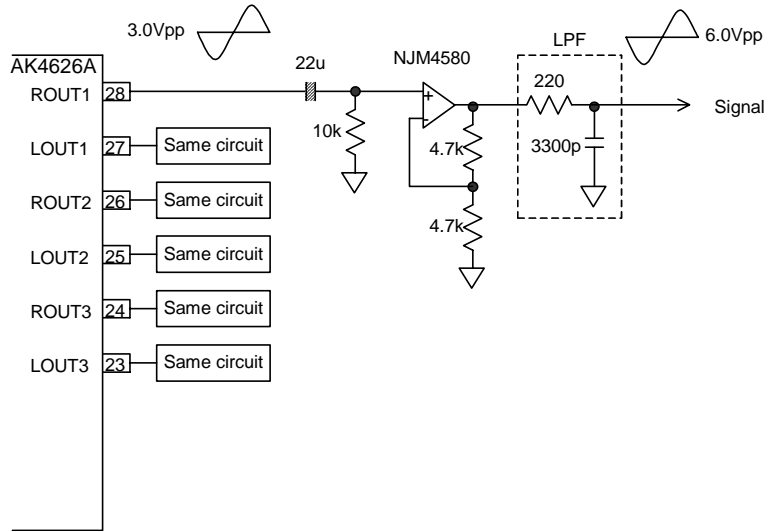
$$fc_1 = 1 / 2\pi RC = 102.7kHz @ R=4.7k, C=330p,$$

$$fc_2 = K * fc_1 = 205.3kHz$$

Frequency response referenced to output level of this board is as following table:

fin	DC	20kHz	40kHz	80kHz	145kHz	∞
Frequency Response	0dB	-0.121dB	-0.452dB	-1.448dB	-3dB	-6dB

If the frequency response of filter influences the system, 1st-order LPF is also available as the following figure:



Frequency response of this LPF

$$| \text{Amplitude} |^2 = 1 / \{ 1 + (f/fc)^2 \};$$

$$fc = 1 / 2\pi RC = 219kHz @ R=220, C=3300p$$

Frequency response referenced to output level of this board is as following table:

fin	DC	20kHz	40kHz	80kHz	219kHz	∞
Frequency Response	0dB	-0.036dB	-0.142dB	-0.543dB	-3dB	-∞dB

The total frequency response of this board is sum of the external filter and internal LPF of AK4626A.

These filters are effective to attenuate the high frequency noise since some measurement units is sensitive for out-of-band noise.

2. Control Software Manual

■ Set-up of evaluation board and control software

1. Set up the AKD4626A-B according to previous term.
2. Connect IBM-AT compatible PC with AKD4626A-B by 10-line type flat cable (packed with AKD4626A-B). 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 “AKD4626A-B Evaluation Kit” into the CD-ROM drive.
4. Access the CD-ROM drive and double-click the icon of “akd4626a.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.
3. Click “Write default” button

■ Explanation of each buttons

1. [Port Reset] : Set up the USB interface board (AKDUSBIF-A) when using the board.
2. [Write default] : Initialize the register of the AK4642EN.
3. [All Write] : Write all registers that is currently displayed.
4. [Function1] : Dialog to write data by keyboard operation.
5. [Function2] : Dialog to write data by keyboard operation.
6. [Function3] : The sequence of register setting can be set and executed.
7. [Function4] : The sequence that is created on [Function3] can be assigned to buttons and executed.
8. [Function5]: The register setting that is created by [SAVE] function on main window can be assigned to buttons and executed.
9. [SAVE] : Save the current register setting.
10. [OPEN] : Write the saved values to all register.
11. [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".

If you want to write the input data to the AK4642EN, 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.

If you want to write the input data to the AK4642EN, click [OK] button. If not, click [Cancel] button.

3. [Function2 Dialog] : Dialog to evaluate DATT

There are dialogs corresponding to register of 03h and 04h.

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

Start Data Box: Input starts data in 2 figures of hexadecimal.

End Data Box: Input end data in 2 figures of hexadecimal.

Interval Box: Data is written to the AK4642EN by this interval.

Step Box: Data changes by this step.

Mode Select Box:

If you check this check box, data reaches end data, and returns to start data.

[Example] Start Data = 00, End Data = 09

Data flow: 00 01 02 03 04 05 06 07 08 09 09 08 07 06 05 04 03 02 01 00

If you do not check this check box, data reaches end data, but does not return to start data.

[Example] Start Data = 00, End Data = 09

Data flow: 00 01 02 03 04 05 06 07 08 09

If you want to write the input data to the AK4642EN, click [OK] button. If not, click [Cancel] button.

4. [SAVE] and [OPEN]

4-1. [SAVE]

All of current register setting values displayed on the main window are saved to the file. The extension of file name is “.akr”.

<Operation flow>

- (1) Click [SAVE] Button.
- (2) Set the file name and click [SAVE] Button. The extension of file name is “.akr”.

4-2. [OPEN]

The register setting values saved by [SAVE] are written to the AK4642EN. The file type is the same as [SAVE].

<Operation flow>

- (1) Click [OPEN] Button.
- (2) Select the file (*.akr) and Click [OPEN] Button.

5. [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”.

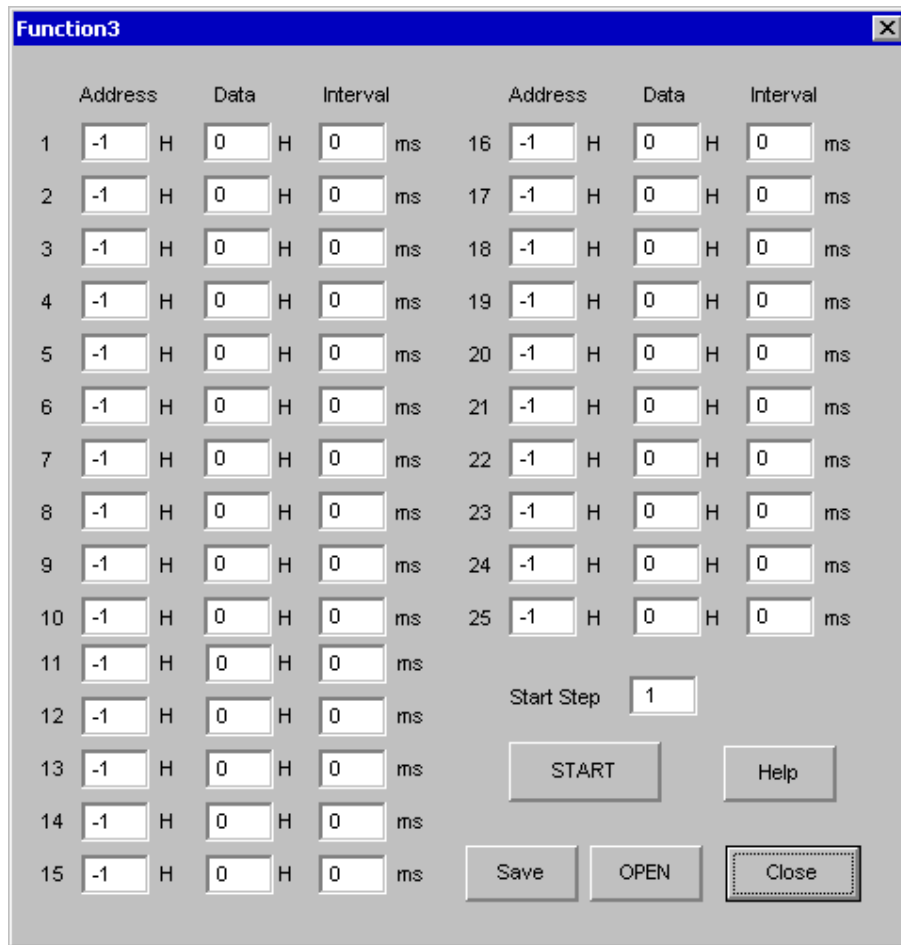


Figure 1. Window of [F3]

6. [Function4 Dialog]

The sequence file (*.aks) saved by [Function3] can be listed up to 10 files, assigned to buttons and then executed. When [F4] button is clicked, the window as shown in Figure 2 opens.

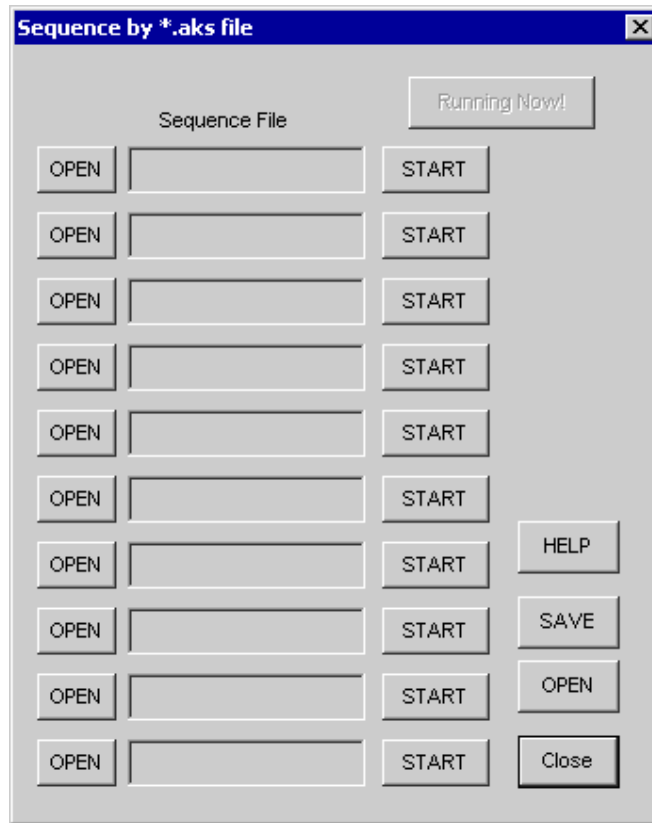


Figure 2. [F4] window

6-1. [OPEN] buttons on left side and [START] buttons

(1) Click [OPEN] button and select the sequence file (*.aks) saved by [Function3].

The sequence file name is displayed as shown in Figure 3. (In case that the selected sequence file name is "DAC_Stereo_ON.aks")

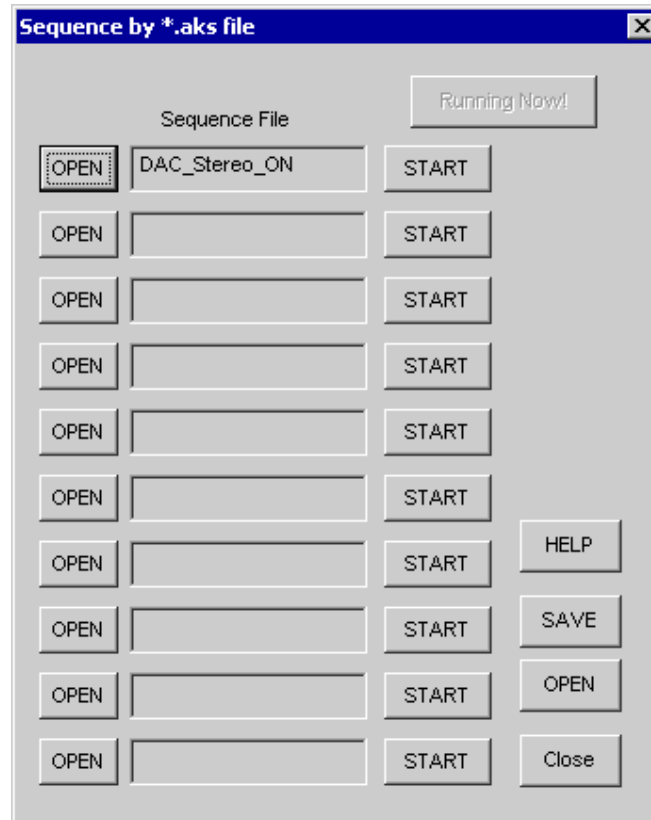


Figure 3. [F4] window(2)

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

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

[SAVE] : The name assign of sequence file displayed on [Function4] window can be saved to the file. The file name is "*.ak4".

[OPEN] : The name assign of sequence file(*.ak4) saved by [SAVE] is loaded.

6-3. Note

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

7. [Function5 Dialog]

The register setting file(*.akr) saved by [SAVE] function on main window can be listed up to 10 files, assigned to buttons and then executed. When [F5] button is clicked, the window as shown in Figure 4 opens.

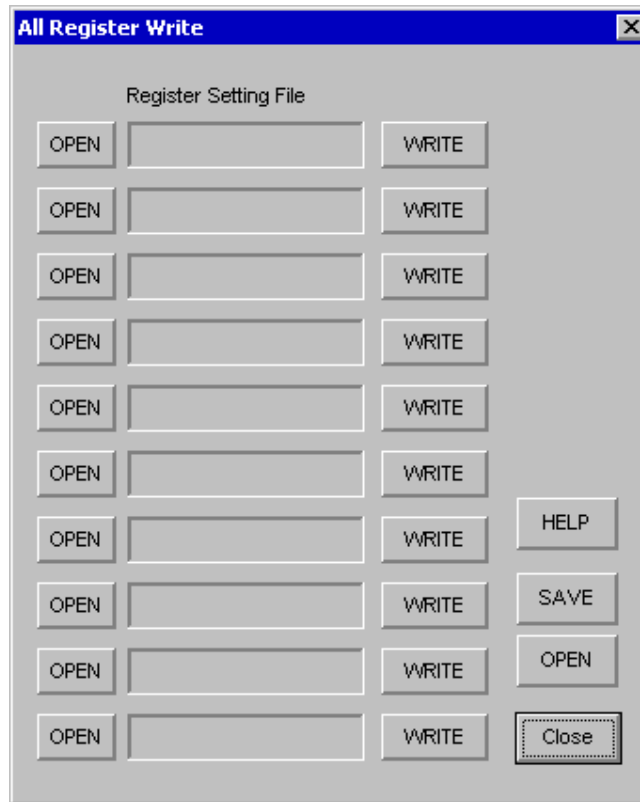


Figure 4. [F5] window

7-1. [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.

7-2. [SAVE] and [OPEN] buttons on right side

[SAVE] : The name assign of register setting file displayed on [Function5] window can be saved to the file. The file name is "*.ak5".

[OPEN] : The name assign of register setting file(*.ak5) saved by [SAVE] is loaded.

7-3. Note

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

AK4112B Control Program ver 1.0 operation manual

■ Set-up of evaluation board and control software

This board is used AK4112B as “DIR”. This software must set up when Evaluation of DAC using DSP and Clock Mode selected X’tal.(See P3. (4)).

This evaluation board does not correspond to I²C control.

1. Set up the AKD4628 according to above mentioned setting.
2. Connect IBM-AT compatible PC with AKD4628 by 10-line type flat cable (packed with AKD4628). Take care of the direction of 10pin header. (Please install the driver in the CD-ROM-disk 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-disk labeled “AKD4628 Control Program ver 1.0” into the CD-ROM-disk drive.
4. Access the CD-ROM-disk drive and double-click the icon of “akd4112.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.
2. Click “Port Setup” button.
3. Then set up the dialog and input data.

■ Explanation of each buttons

1. [Port Setup] : set up the printer port.
2. [Write default] : initialize the register of AK4112B.
3. [All read] : read all registers of AK4112B.
4. [Read] : read data from each register.
5. [Write] : write data to each register.

If you want to write the input data to AK4112B, click “OK” button. If not, click “Cancel” button.

■ 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.

MEASUREMENT RESULTS

1) ADC part

[Measurement condition]

- Measurement unit : Audio Precision, System two, Cascade
- MCLK : 256fs
- BICK : 64fs
- fs : 48kHz, 96kHz
- BW : 10Hz~20kHz(fs=48kHz), 10Hz~48kHz(fs=96kHz)
- Bit : 24bit
- Power Supply : AVDD=DVDD=5V, TVDD=3.3V
- Interface : DIT(AK4103A)
- Temperature : Room

fs=48kHz

Parameter	Input signal	Measurement filter	Lch	Rch
S/(N+D)	1kHz, -0.5dB	20kLPF	95.2dB	96.4dB
DR	1kHz, -60dB	20kLPF	99.7dB	99.5dB
		20kLPF+A-weighted	102.4dB	102.4dB
S/N	no signal	20kLPF	99.8dB	99.8dB
		20kLPF+A-weighted	102.6dB	102.8dB

fs=96kHz

Parameter	Input signal	Measurement filter	Lch	Rch
S/(N+D)	1kHz, -0.5dB	fs/2	92.6dB	94.1dB
DR	1kHz, -60dB	fs/2	97.8dB	97.8dB
		20kHz+A-weighted	104.9dB	104.9dB
S/N	no signal	fs/2	97.9dB	97.9dB
		20kHz+A-weighted	105.2dB	105.4dB

2) DAC part

[Measurement condition]

- Measurement unit : Audio Precision, System two, Cascade(fs=48kHz, 96kHz)
- MCLK : 256fs
- BICK : 64fs
- fs : 48kHz, 96kHz
- BW : 10Hz~22kHz (fs=48kHz), 10Hz~40kHz (fs=96kHz)
- Bit : 24bit
- Power Supply : AVDD=DVDD=5V, TVDD=3.3V
- Interface : DIR(AK4112B)
- Temperature : Room

fs=48kHz

Parameter	Input signal	Measurement filter	Lch	Rch
S/(N+D)	1kHz, 0dBFS	20kLPF	97.0dB	95.9dB
DR	1kHz, -60dBFS	20kLPF	102.5dB	102.5dB
		22kLPF+A-weighted	105.0dB	105.0dB
S/N	no signal	20kLPF	103.0dB	103.0dB
		22kLPF+A-weighted	105.0dB	105.0dB

fs=96kHz

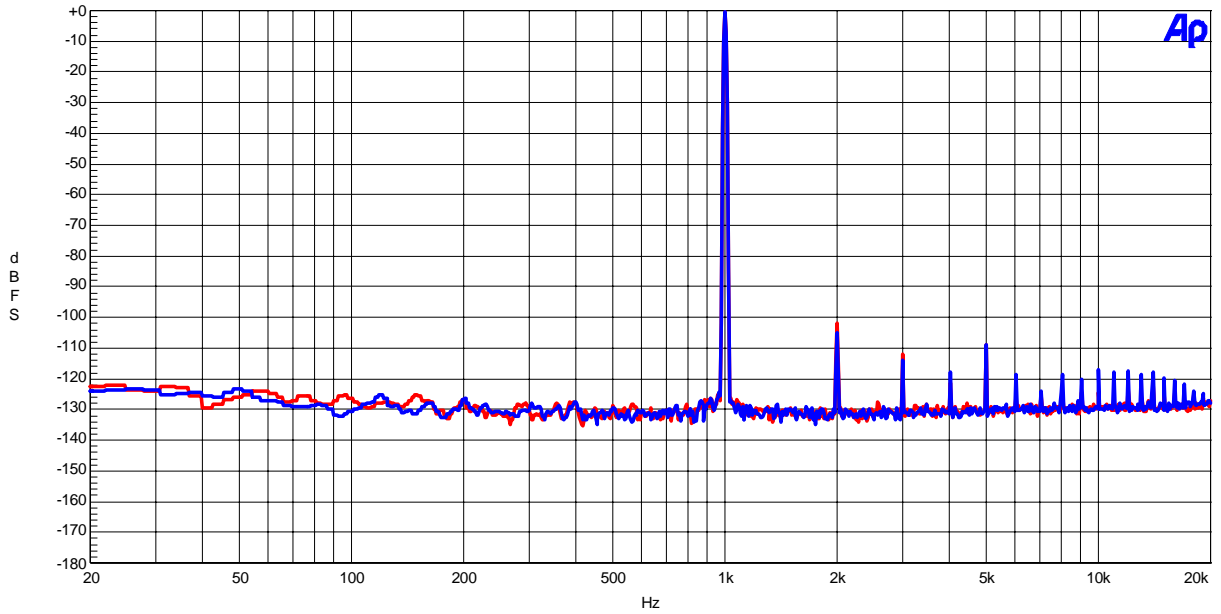
Parameter	Input signal	Measurement filter	Lch	Rch
S/(N+D)	1kHz, 0dBFS	40kHzLPF	94.9dB	94.2dB
DR	1kHz, -60dBFS	40kHzLPF	101.7dB	101.5dB
		22kHz+A-weighted	106.3dB	106.1dB
S/N	no signal	40kHz	101.8dB	101.7dB
		22kHz+A-weighted	106.7dB	106.5dB

1.ADC

(ADC fs=48kHz)

AKM

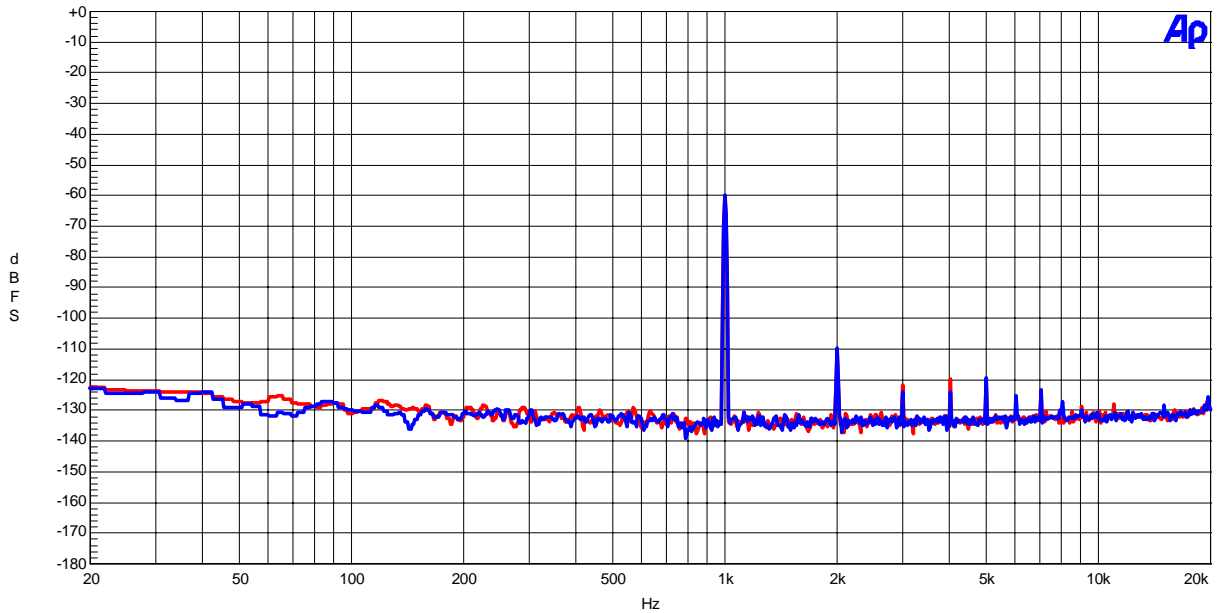
AK4626A ADC FFT Plot
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=-0.5dBFS, fin=1kHz



FFT (Input=-0.5dBFS, fin=1kHz)

AKM

AK4626A ADC FFT Plot
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=-60dBFS, fin=1kHz

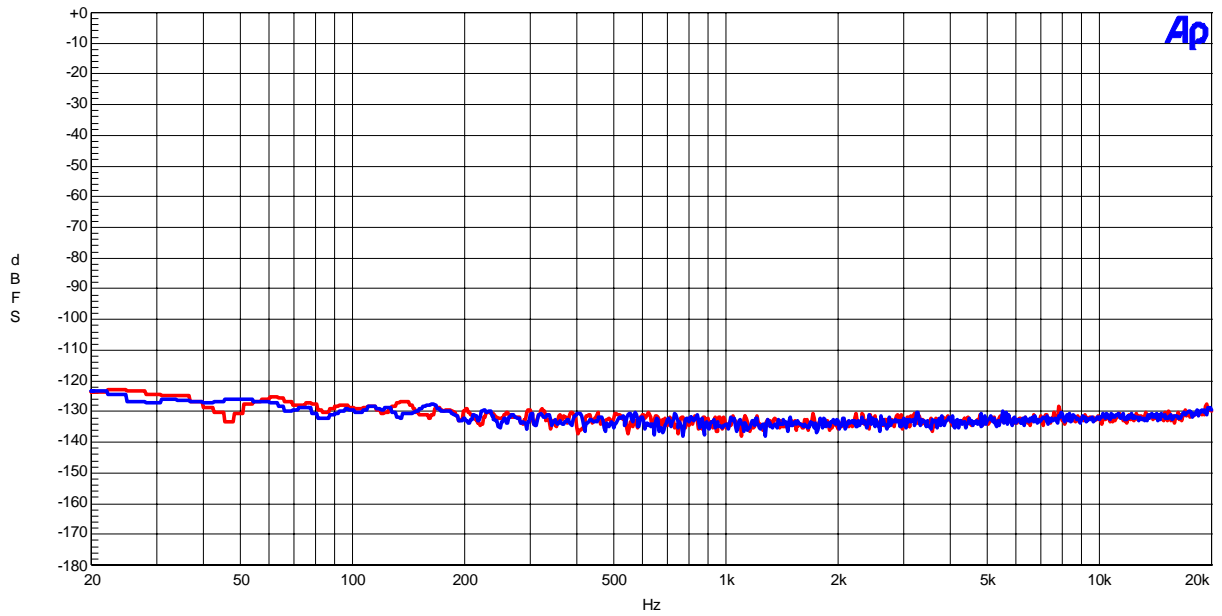


FFT (Input=-60dBFS, fin=1kHz)

(ADC fs=48kHz)

AKM

AK4626A ADC FFT Plot
AVDD=DVDD=TVDD=5V, fs=48kHz, fin=None

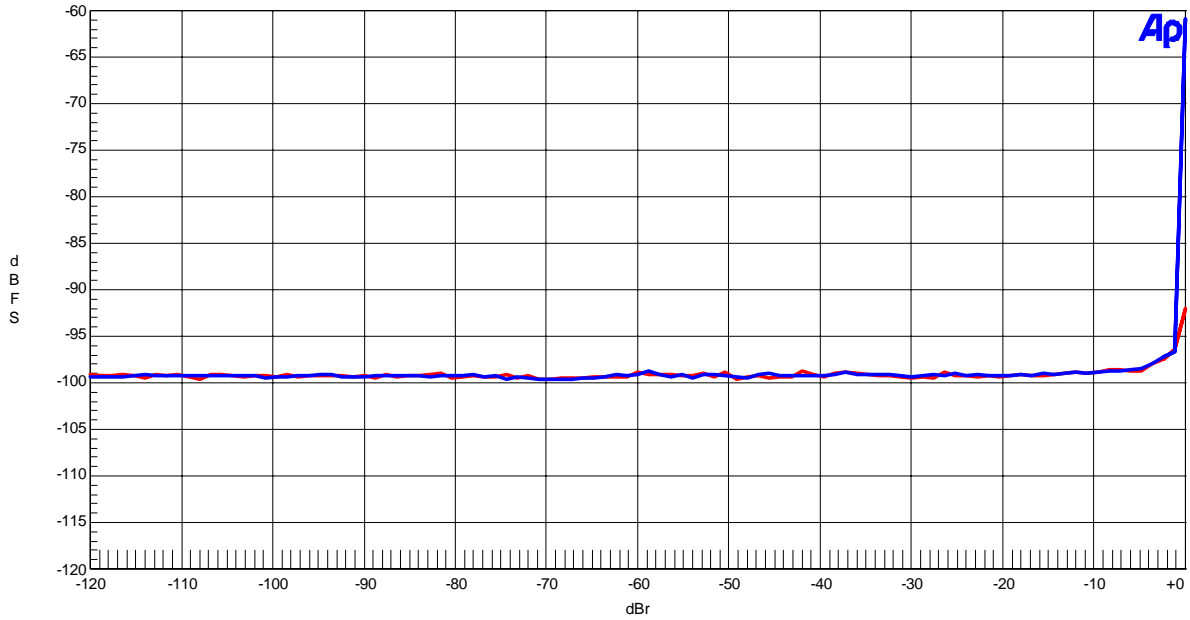


FFT (noise floor)

(ADC fs=48kHz)

AKM

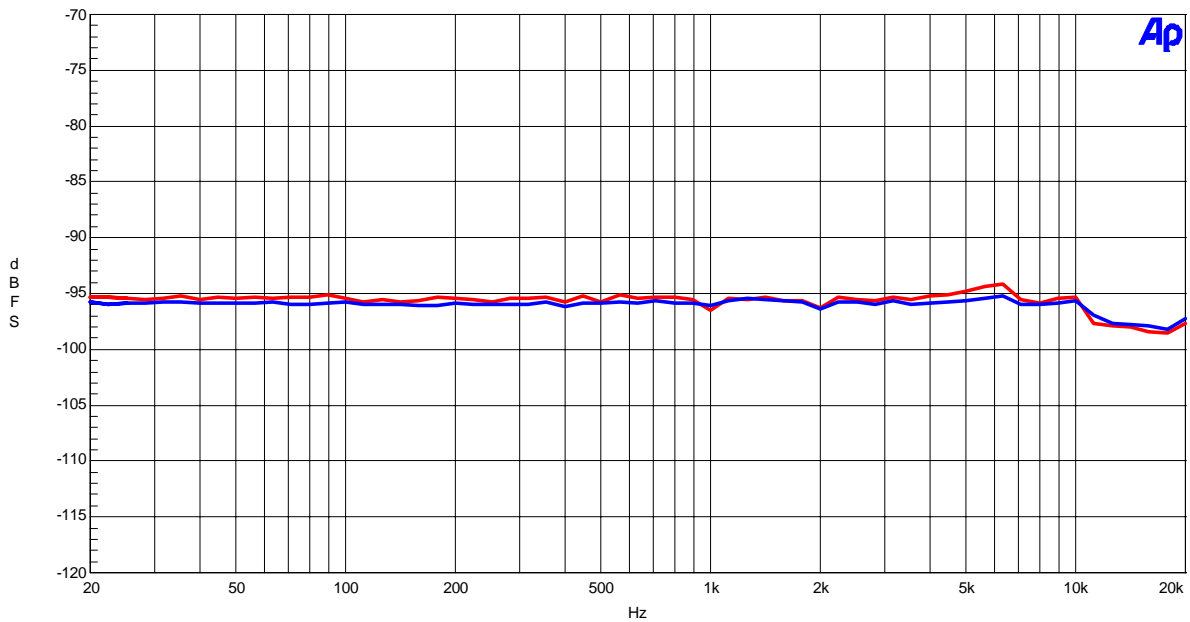
AK4626A ADC THD+N vs Input Level
AVDD=DVDD=TVDD=5V, fs=48kHz, fin=1kHz



THD + N vs Amplitude (fin=1kHz)

AKM

AK4626A ADC THD+N vs Input Frequency
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=-0.5dBFS

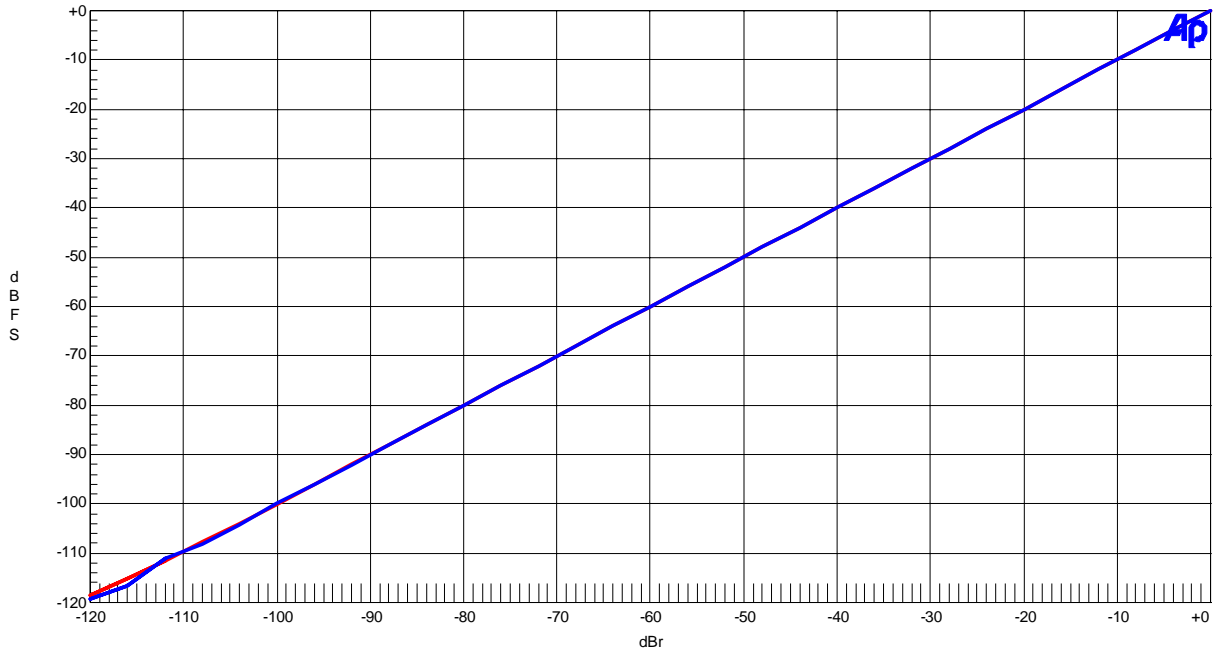


THD + N vs Input Frequency (Input=-0.5dBFS)

(ADC fs=48kHz)

AKM

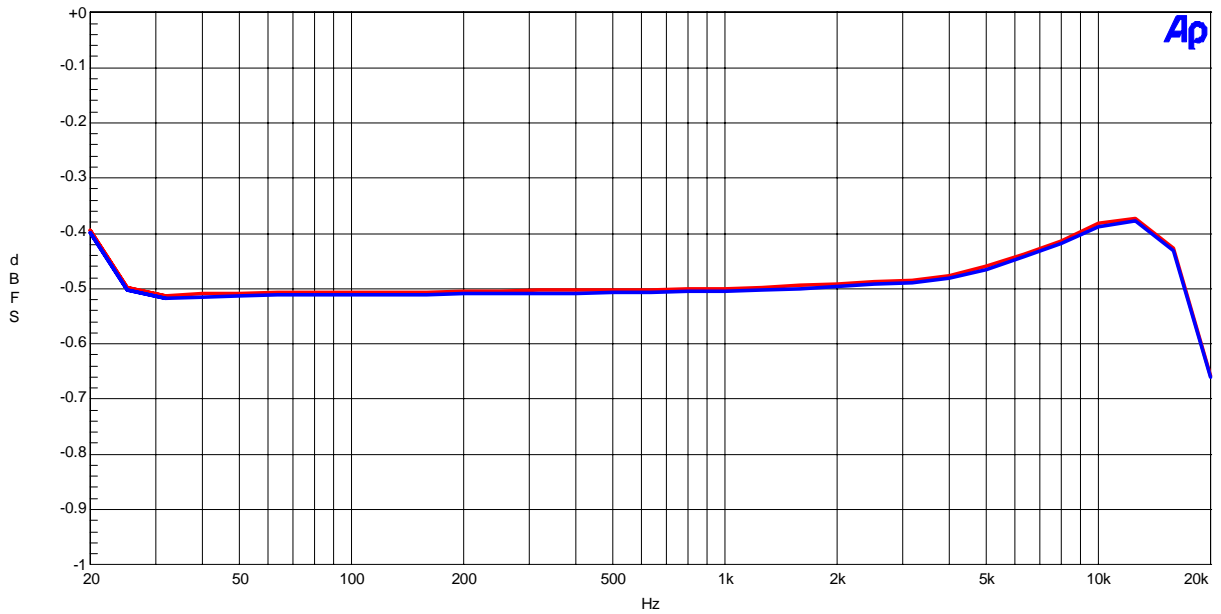
AK4626A ADC Linearity
AVDD=DVDD=TVDD=5V, fs=48kHz, fin=1kHz



Linearity (fin=1kHz)

AKM

AK4626A ADC Frequency Response
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=-0.5dBFS, fin=1kHz

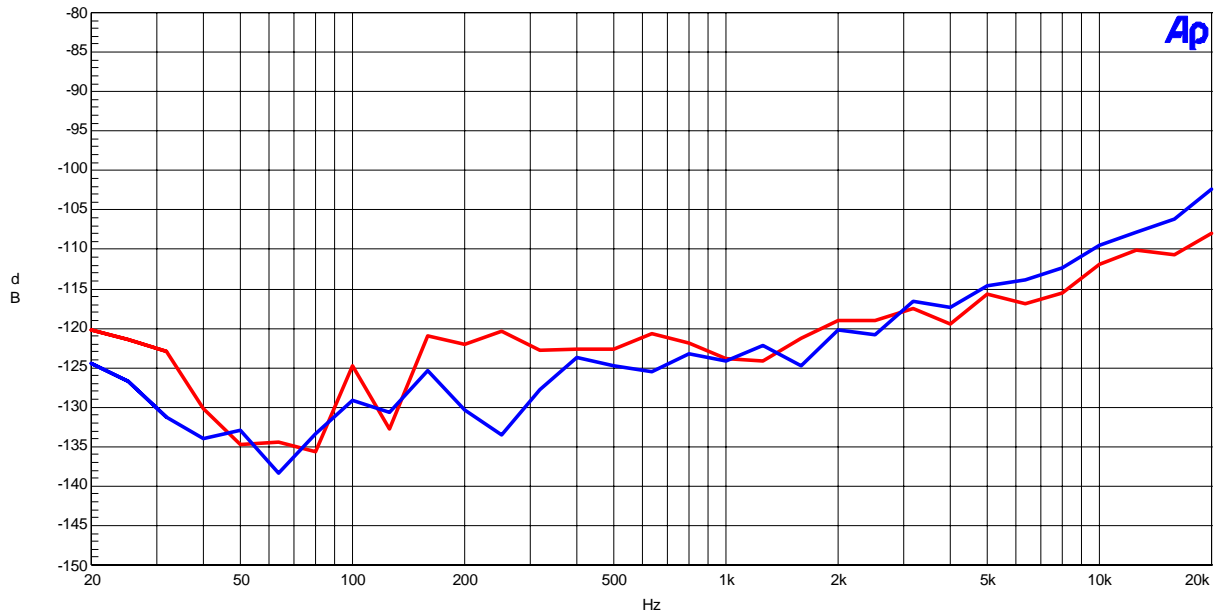


Frequency Response (Input Level=-0.5dBFS)
(including input RC filter)

(ADC fs=48kHz)

AKM

AK4626A ADC Crosstalk
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=-0.5dBFS

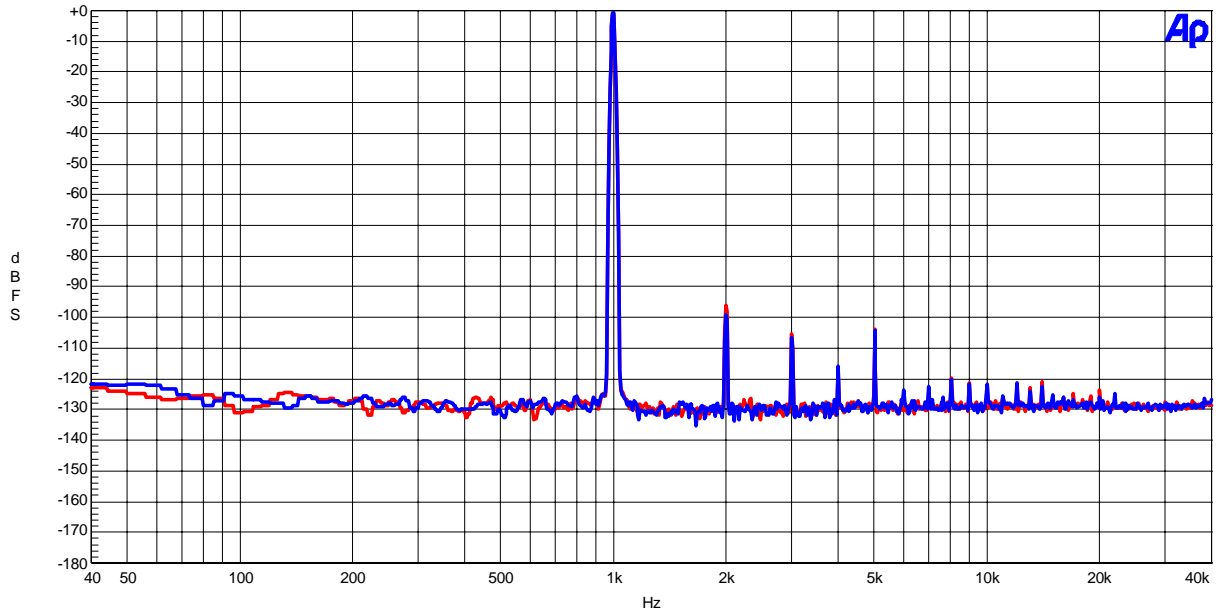


Crosstalk (Blue= Rch, Red= Lch)

(ADC fs=96kHz)

AKM

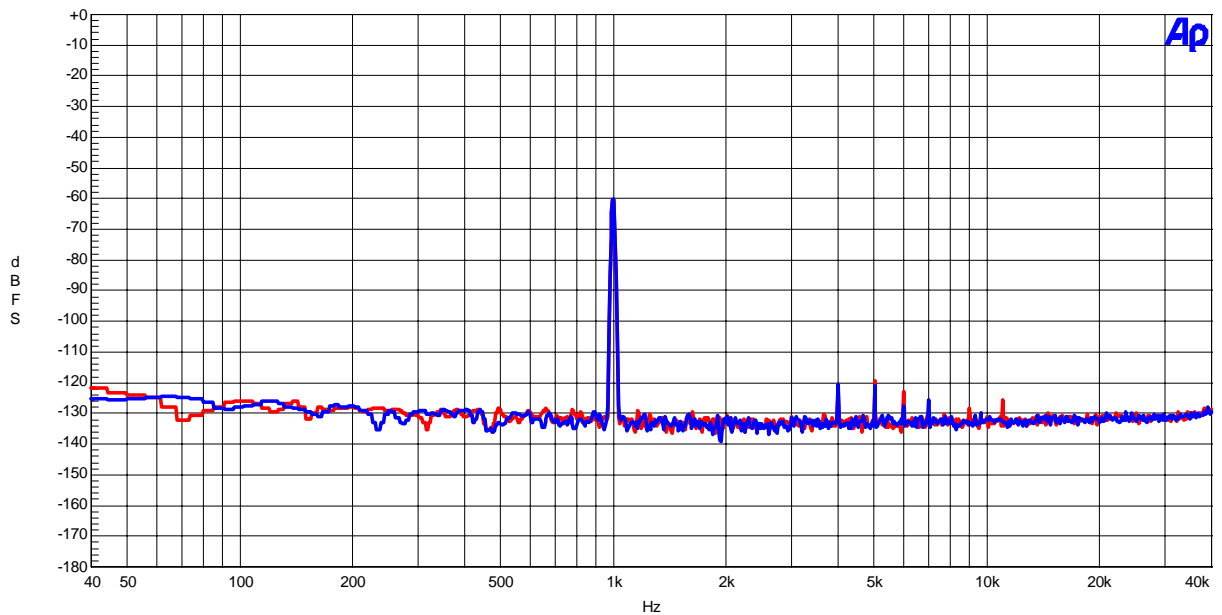
AK4626A ADC FFT Plot
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=-0.5dBFS, fin=1kHz



FFT (Input=-0.5dBFS, fin=1kHz)

AKM

AK4626A ADC FFT Plot
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=-60dBFS, fin=1kHz

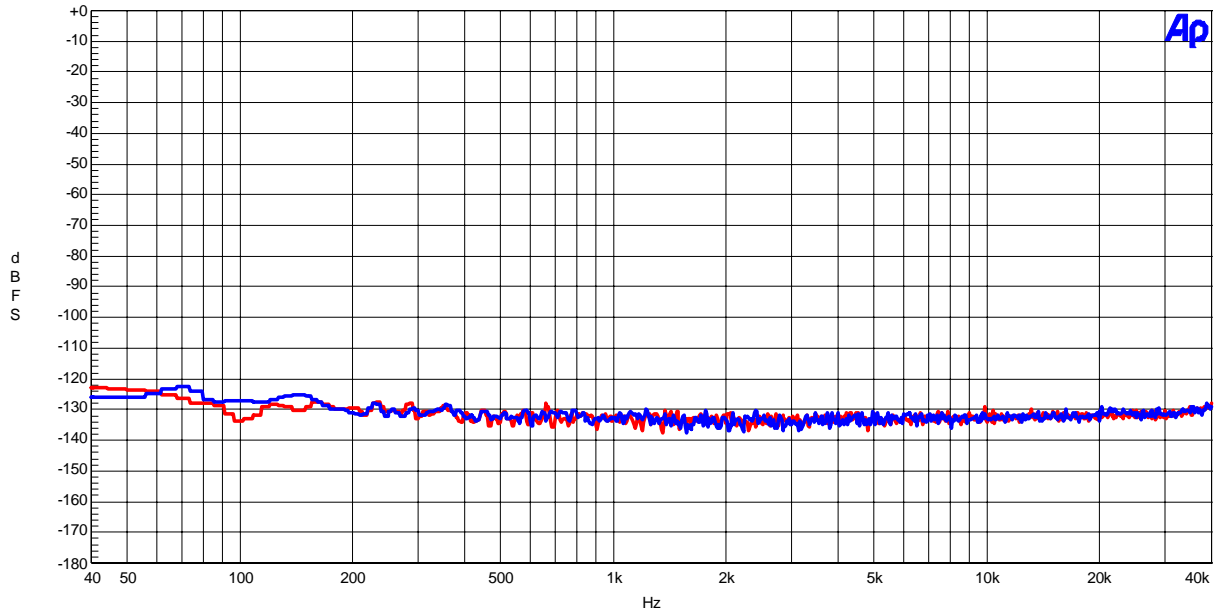


FFT (Input=-60dBFS, fin=1kHz)

(ADC fs=96kHz)

AKM

AK4626A ADC FFT Plot
AVDD=DVDD=TVDD=5V, fs=96kHz, fin=None

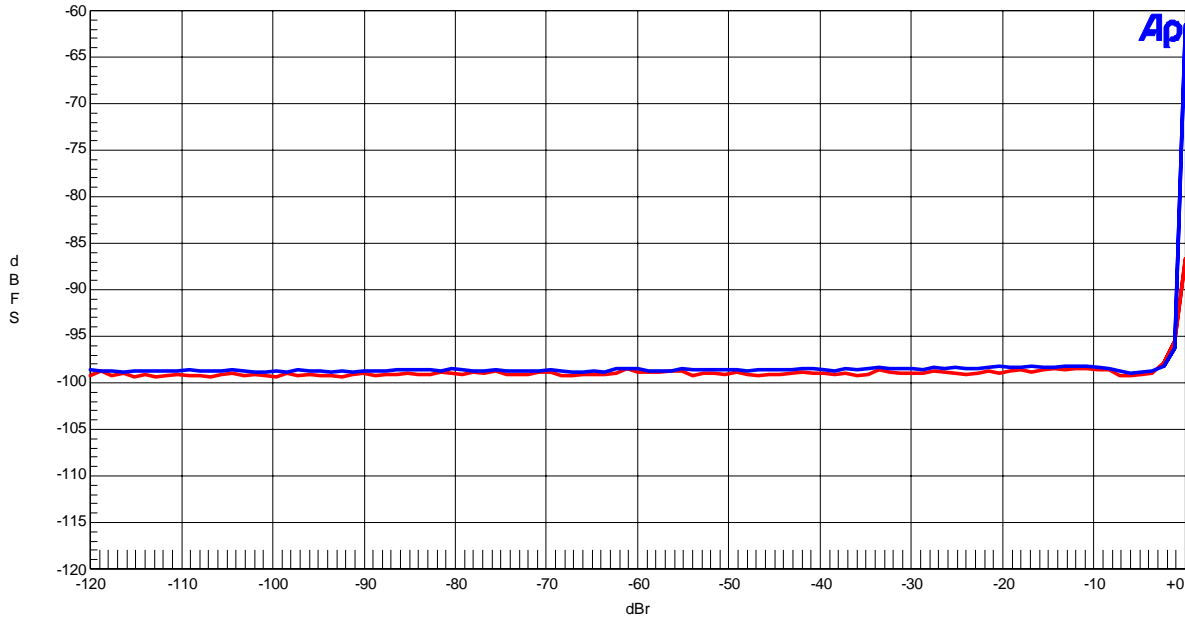


FFT (Noise floor)

(ADC fs=96kHz)

AKM

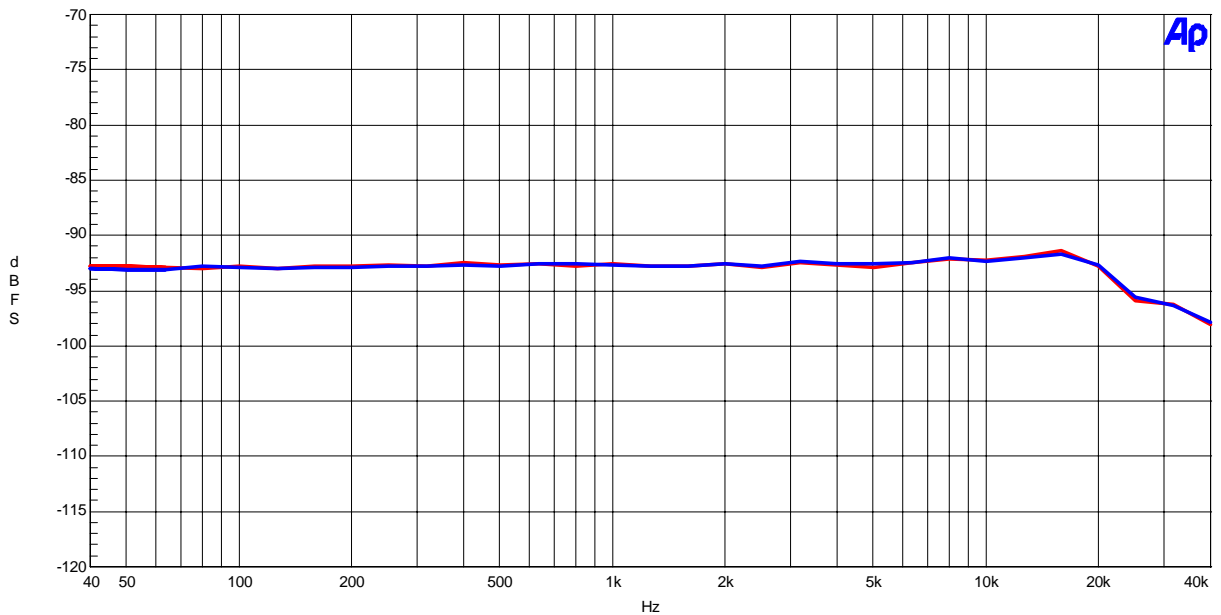
AK4626A ADC THD+N vs Input Level
AVDD=DVDD=TVDD=5V, fs=96kHz, fin=1kHz



THD + N vs Amplitude (fin=1kHz)

AKM

AK4626A ADC THD+N vs Input Frequency
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=-0.5dBFS

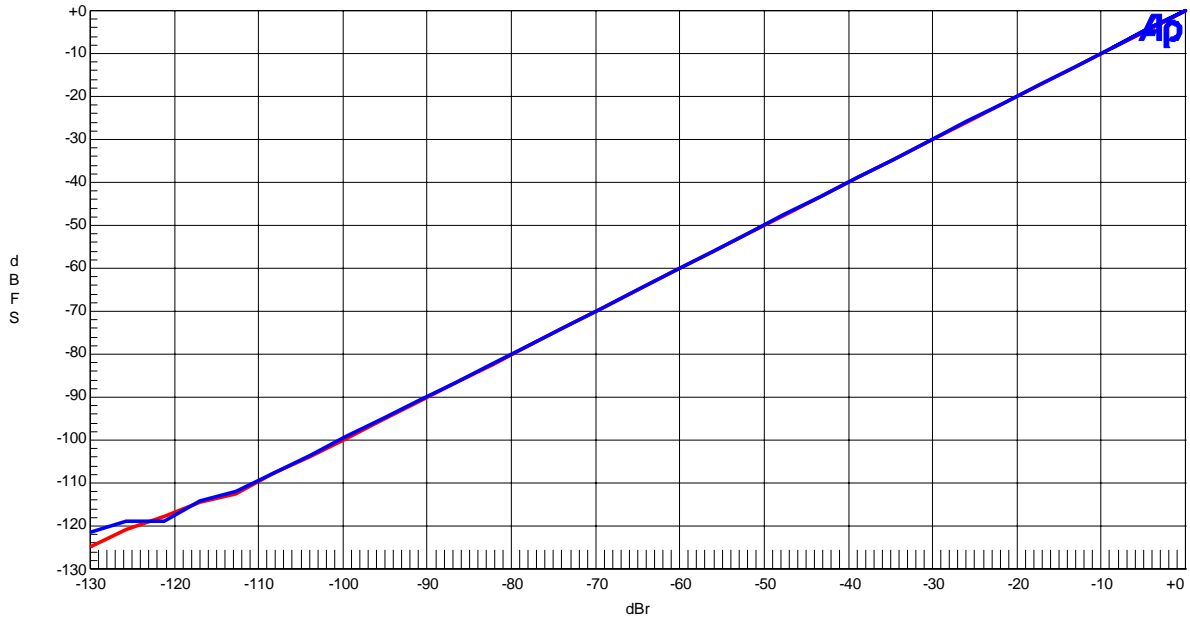


THD + N vs Input Frequency (Input Level=-0.5dBFS)

(ADC fs=96kHz)

AKM

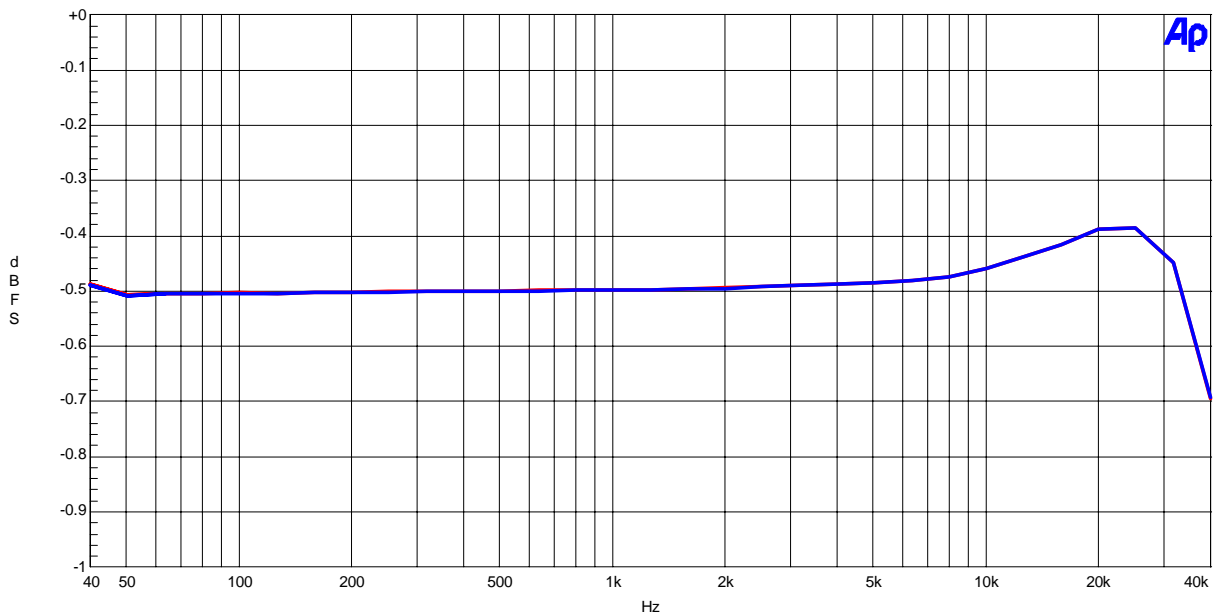
AK4626A ADC Linearity
AVDD=DVDD=TVDD=5V, fs=96kHz, fin=1kHz



Linearity (fin=1kHz)

AKM

AK4626A ADC Frequency Response
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=-0.5dBFS, fin=1kHz

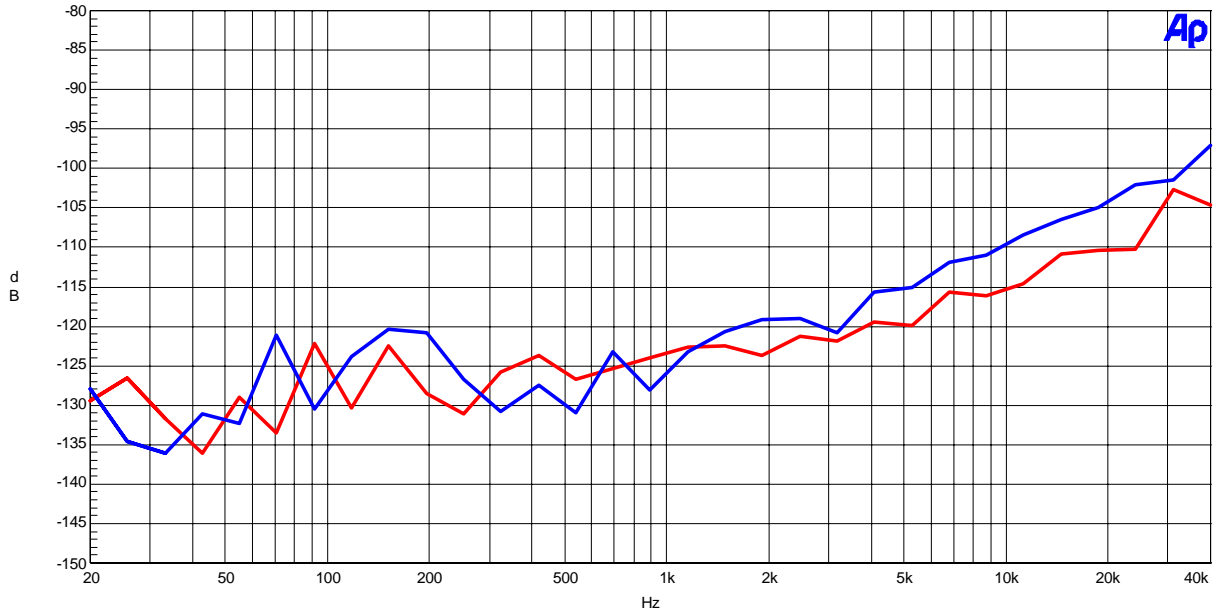


Frequency Response(Input Level=-0.5dBFS)
(including input RC filter)

(ADC fs=96kHz)

AKM

AK4626A ADC Crosstalk
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=-0.5dBFS



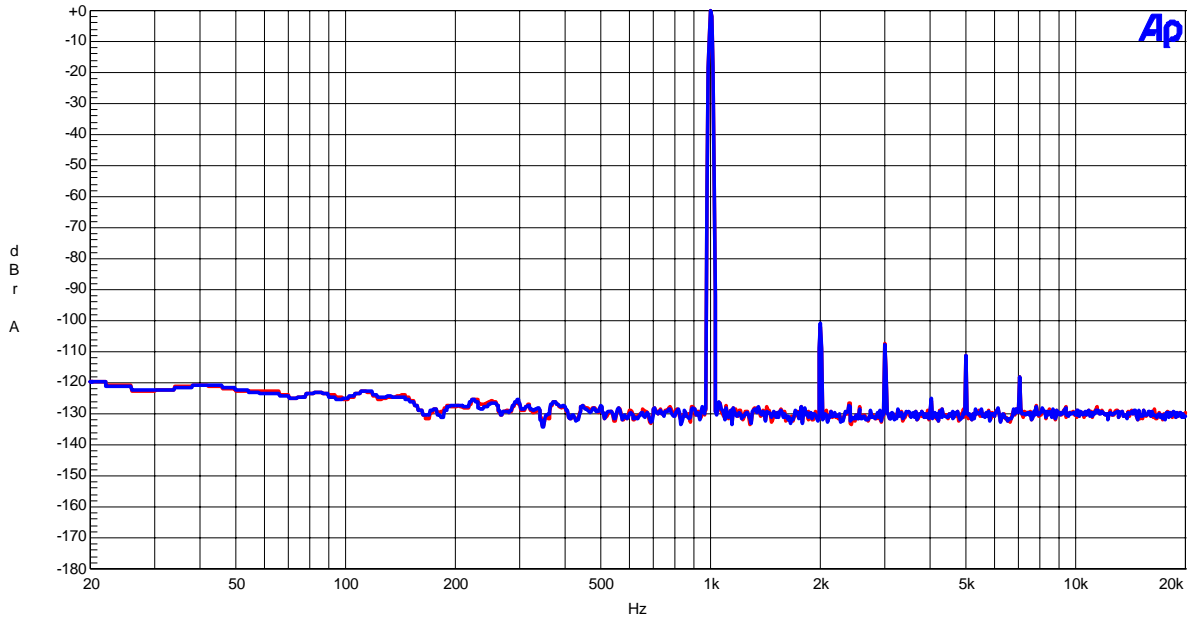
Crosstalk (Blue= Rch, Red= Lch)

2.DAC

(DAC fs=48kHz)

AKM

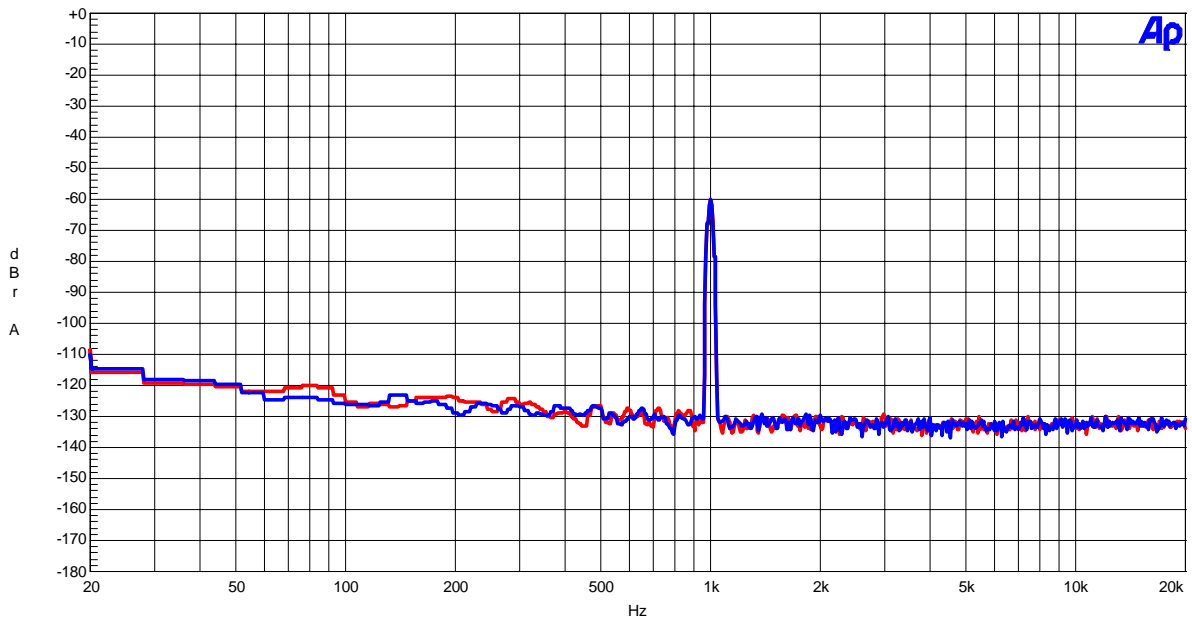
AK4626A FFT Plot
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=0dBFS, fin=1kHz



FFT (Input=0dBFS, fin=1kHz)

AKM

AK4626A FFT Plot
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=-60dBFS, fin=1kHz

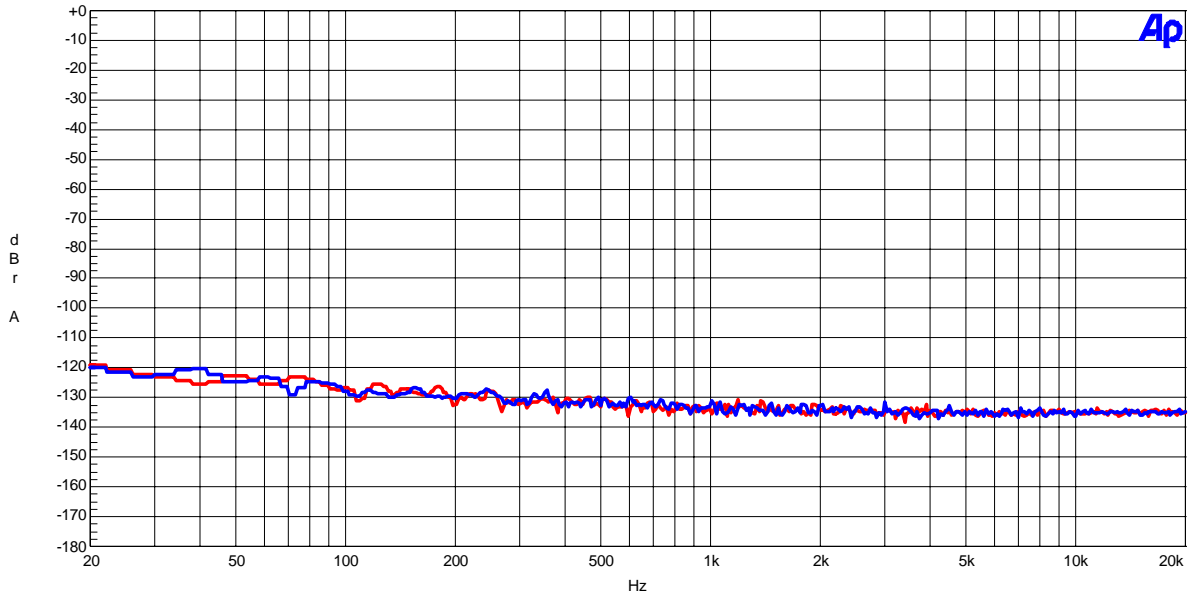


FFT (Input=-60dBFS, fin=1kHz)

(DAC fs=48kHz)

AKM

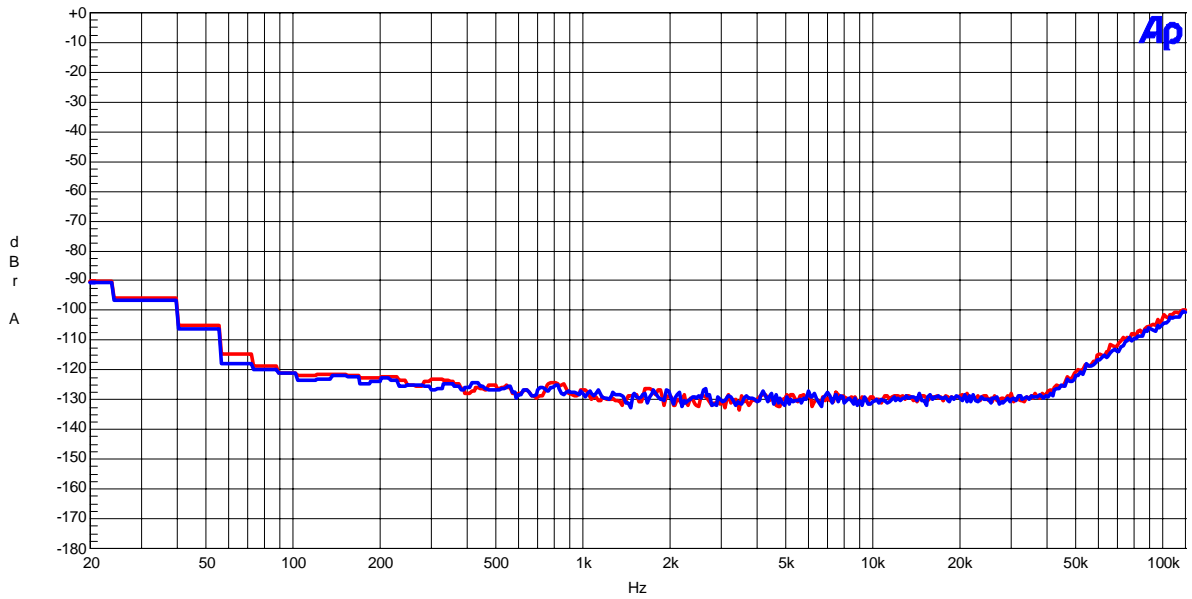
AK4626A FFT Plot
AVDD=DVDD=TVDD=5V, fs=48kHz, fin=None



FFT (Noise floor)

AKM

AK4626A FFT Plot(Out-of-band noise)
AVDD=DVDD=TVDD=5V, fs=48kHz, fin=None

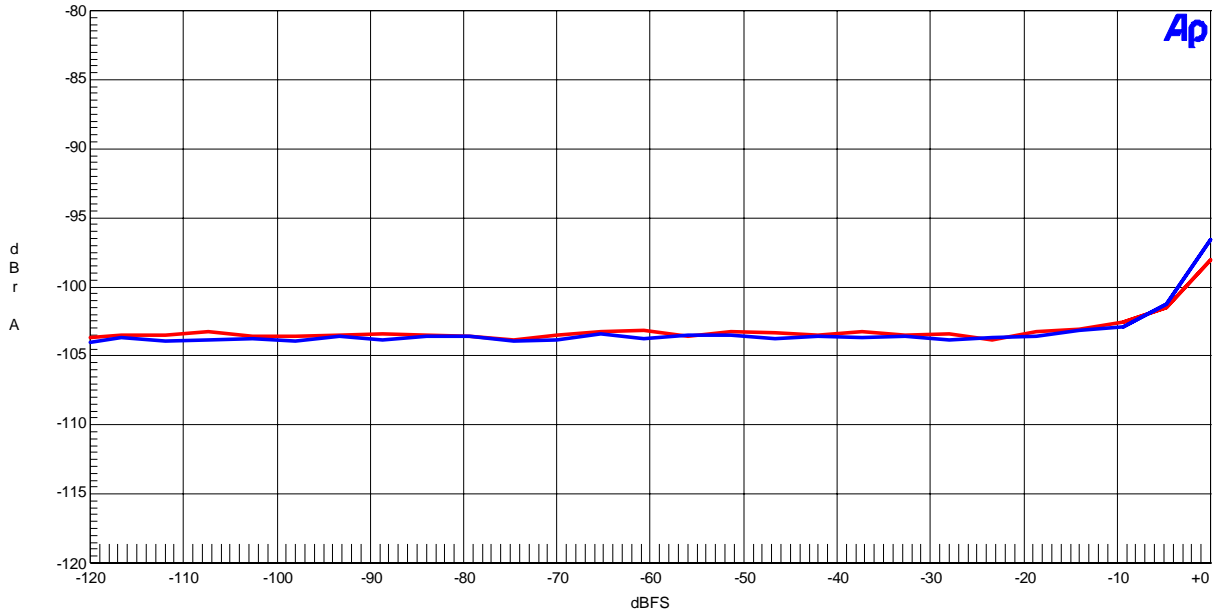


FFT (Out-of-band noise)

(DAC fs=48kHz)

AKM

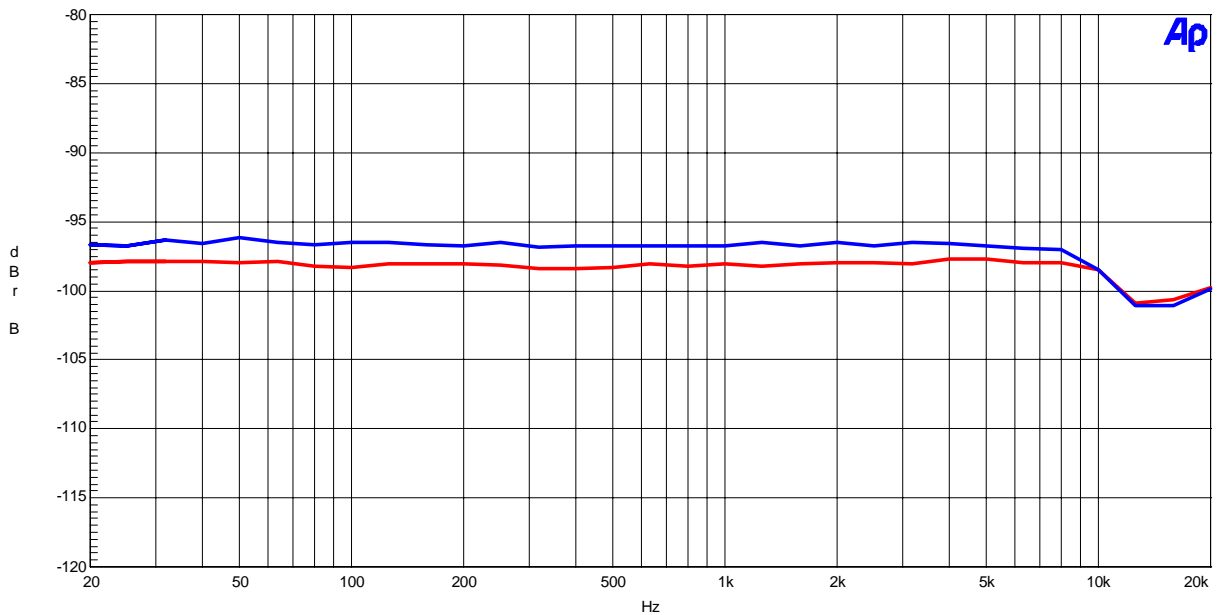
AK4626A DAC THD+N vs Input Level
AVDD=DVDD=TVDD=5V, fs=48kHz, fin=1kHz



THD + N vs Amplitude (fin=1kHz)

AKM

AK4626A DAC THD+N vs Input Frequency
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=0dBFS

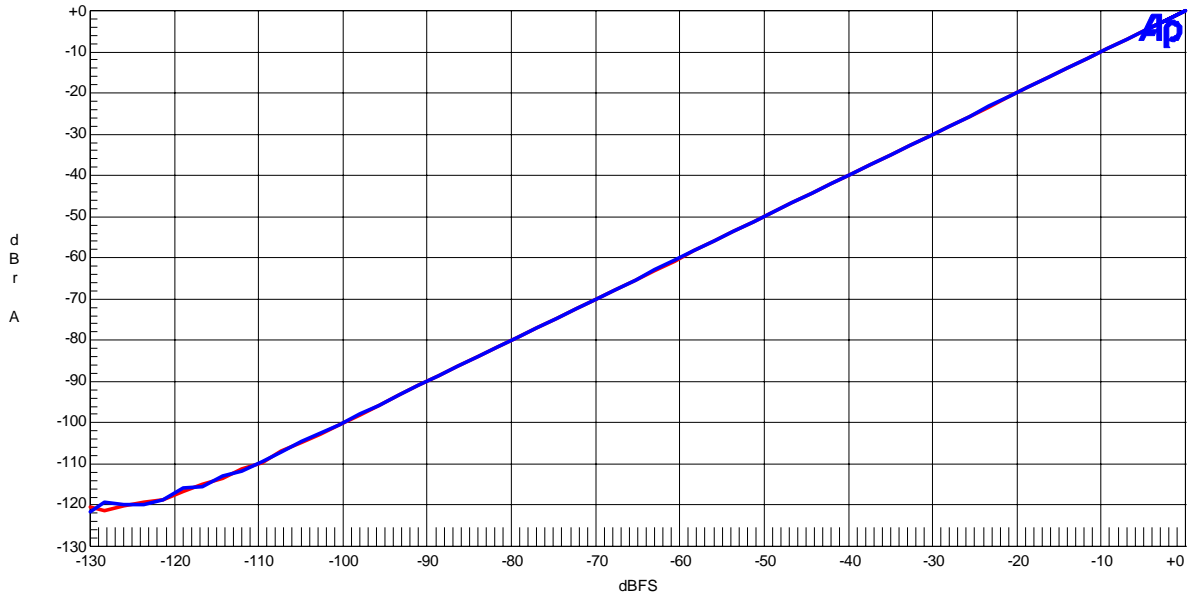


THD + N vs Input Frequency (Input=0dBFS)

(DAC fs=48kHz)

AKM

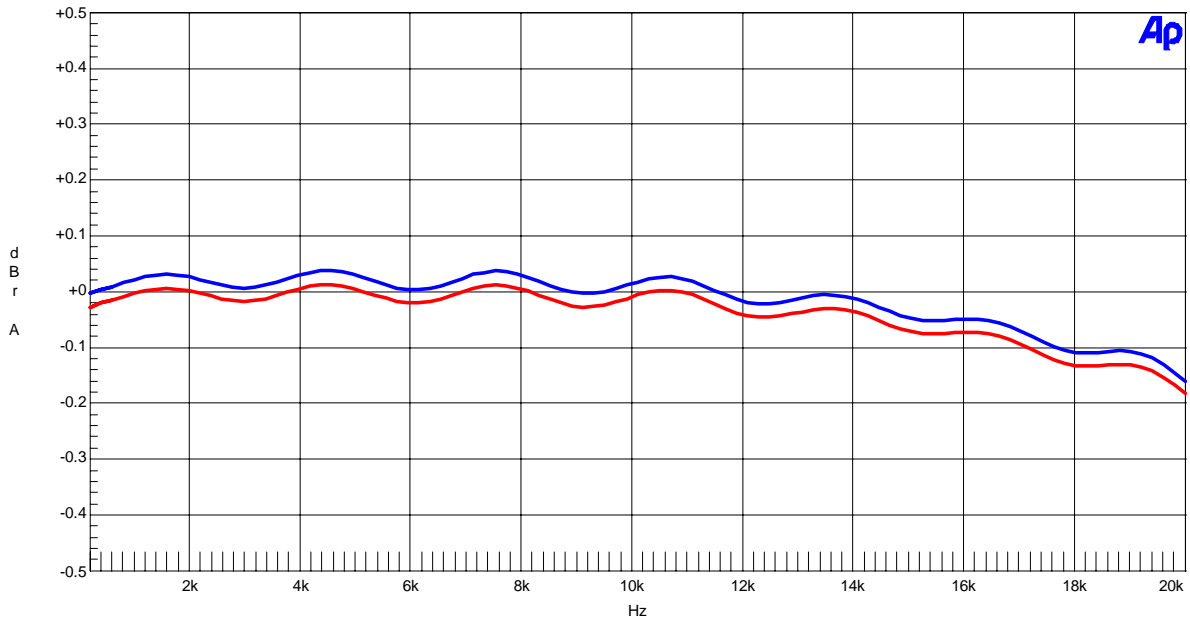
AK4626A Linearity
AVDD=DVDD=TVDD=5V, fs=48kHz, fin=1kHz



Linearity (fin=1kHz)

AKM

AK4626A Frequency Response
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=0dBFS

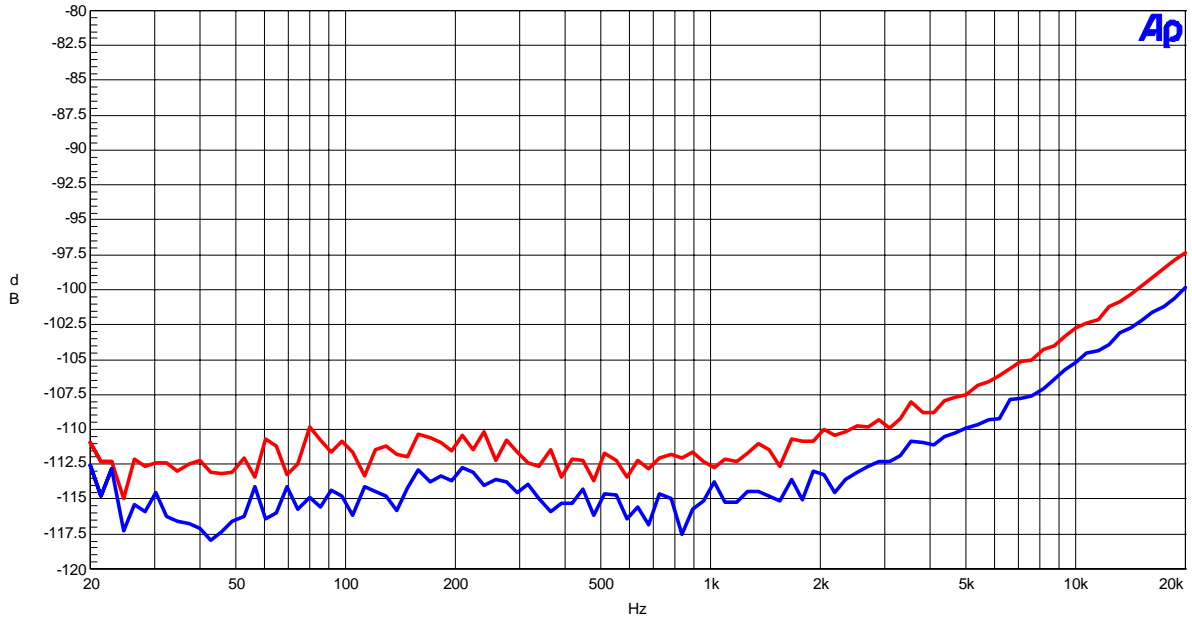


Frequency Response (Input Level=0dBFS)
(including external RC filter)

(DAC fs=48kHz)

AKM

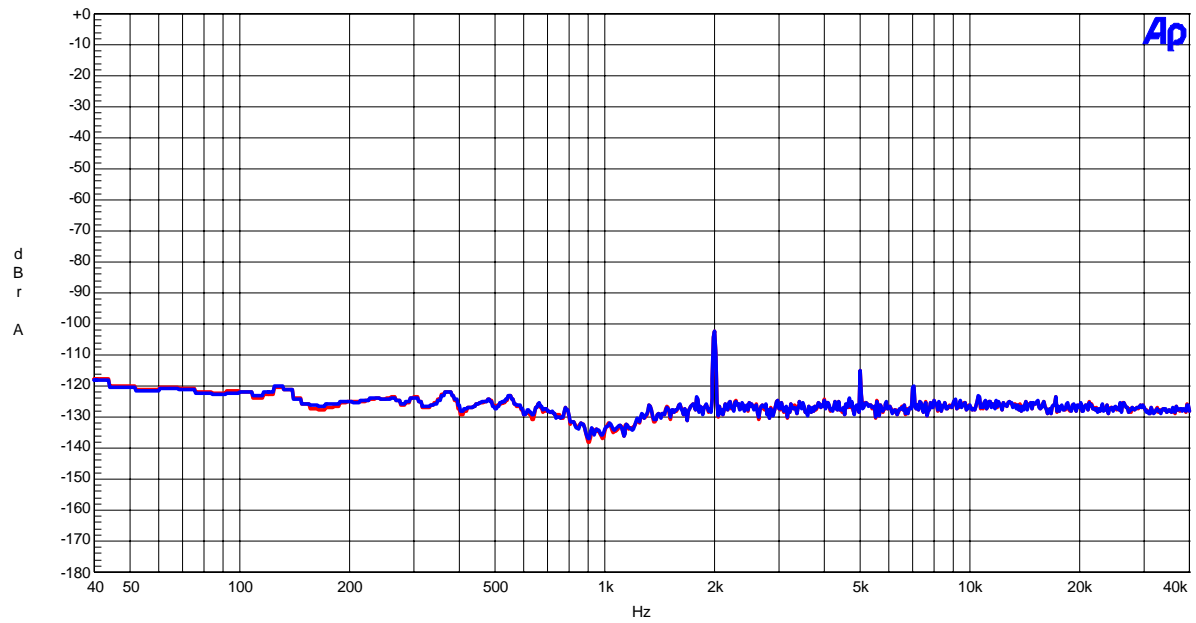
AK4626A Crosstalk(Upper@1kHz; Lch-->Rch, Lower@1kHz; Rch-->Lch)
AVDD=DVDD=TVDD=5V, fs=48kHz, Input Level=0dBFS



Crosstalk (Blue= Rch, Red= Lch)

(DAC fs=96kHz)
AKM

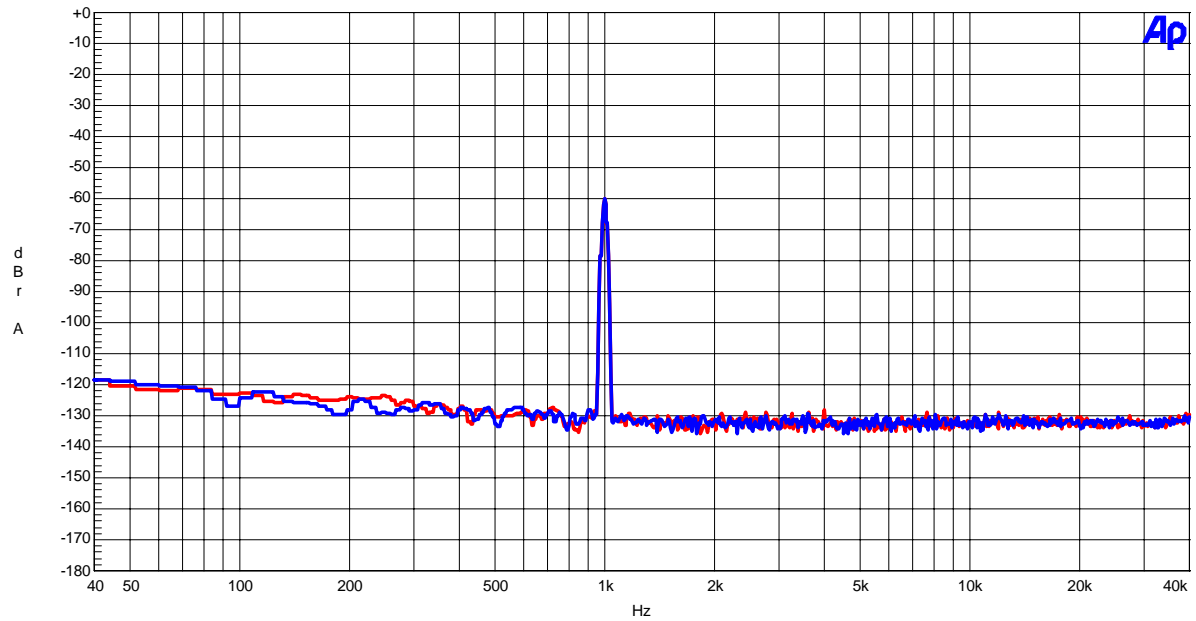
AK4626A FFT Plot
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=0dBFS, fin=1kHz, Notch=on



FFT (Input=0dBFS, fin=1kHz, Notch)

AKM

AK4626A FFT Plot
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=-60dBFS, fin=1kHz

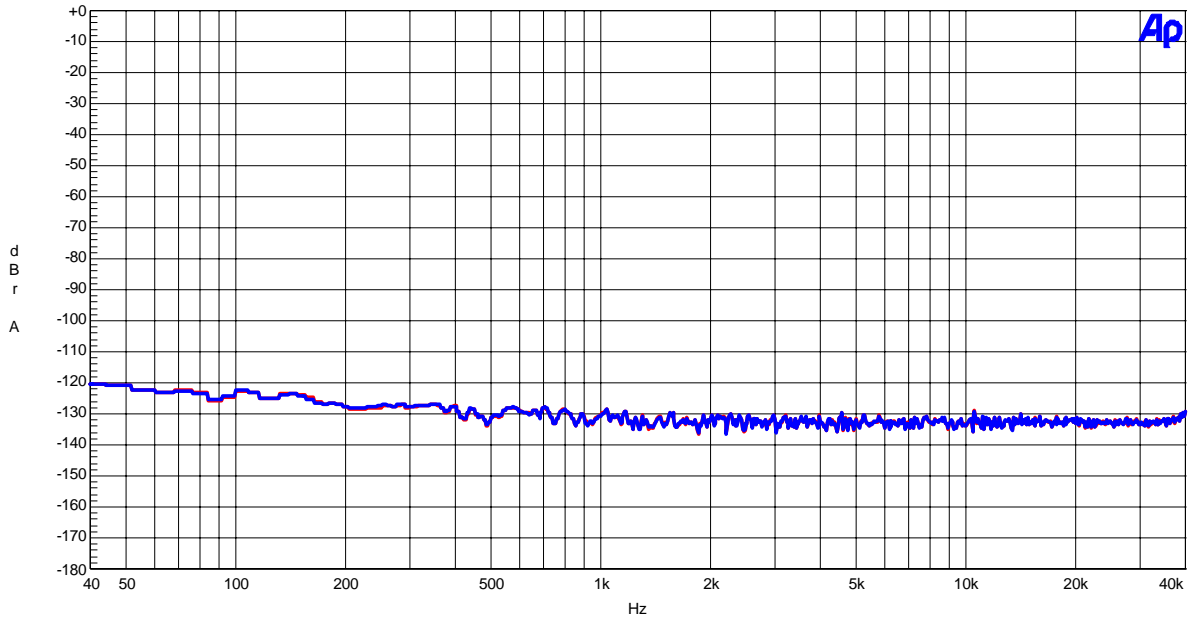


FFT (Input=-60dBFS,fin=1kHz)

(DAC fs=96kHz)

AKM

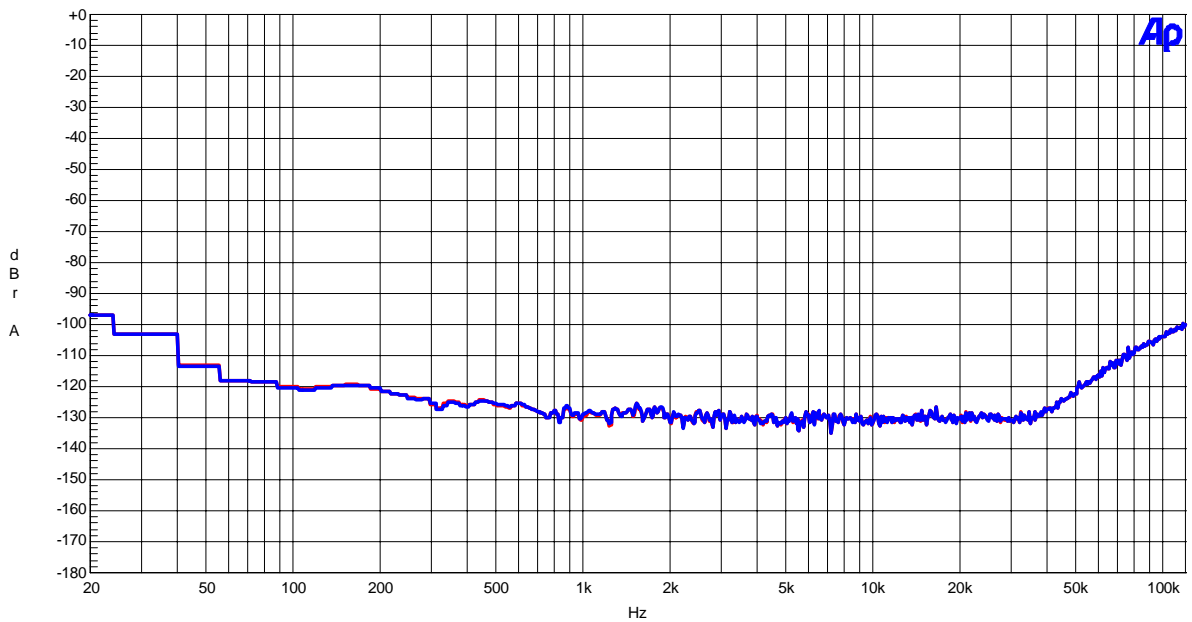
AK4626A FFT Plot
AVDD=DVDD=TVDD=5V, fs=96kHz, fin=None



FFT (Noise floor)

AKM

AK4626A FFT Plot(Out-of-band noise)
AVDD=DVDD=TVDD=5V, fs=96kHz, fin=None

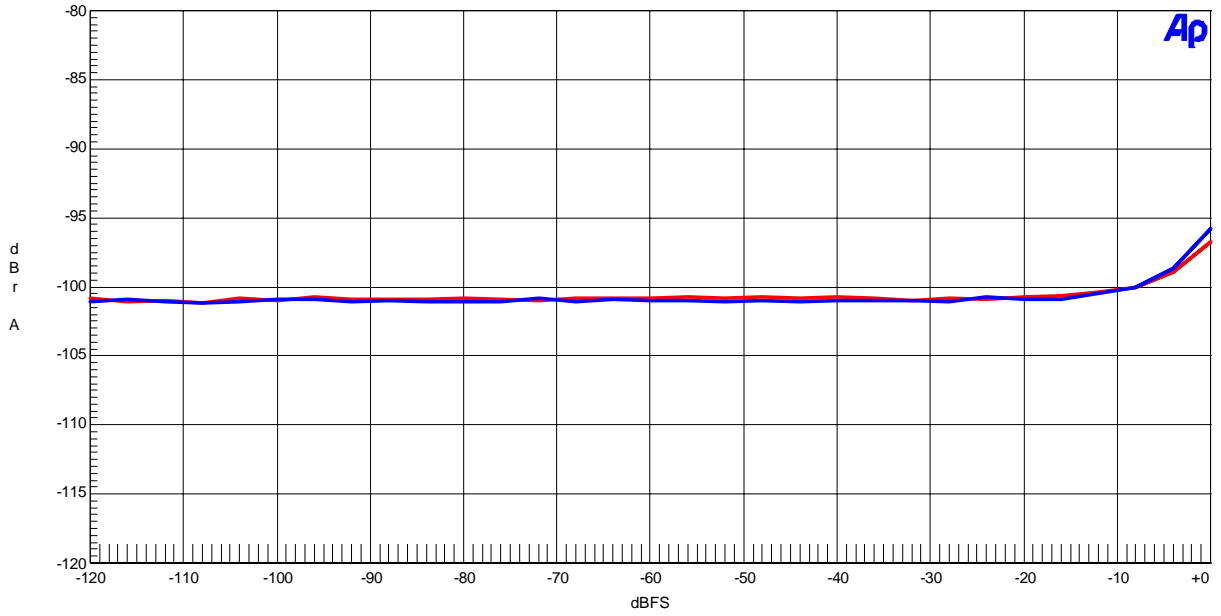


FFT (Out-of-band noise)

(DAC fs=96kHz)

AKM

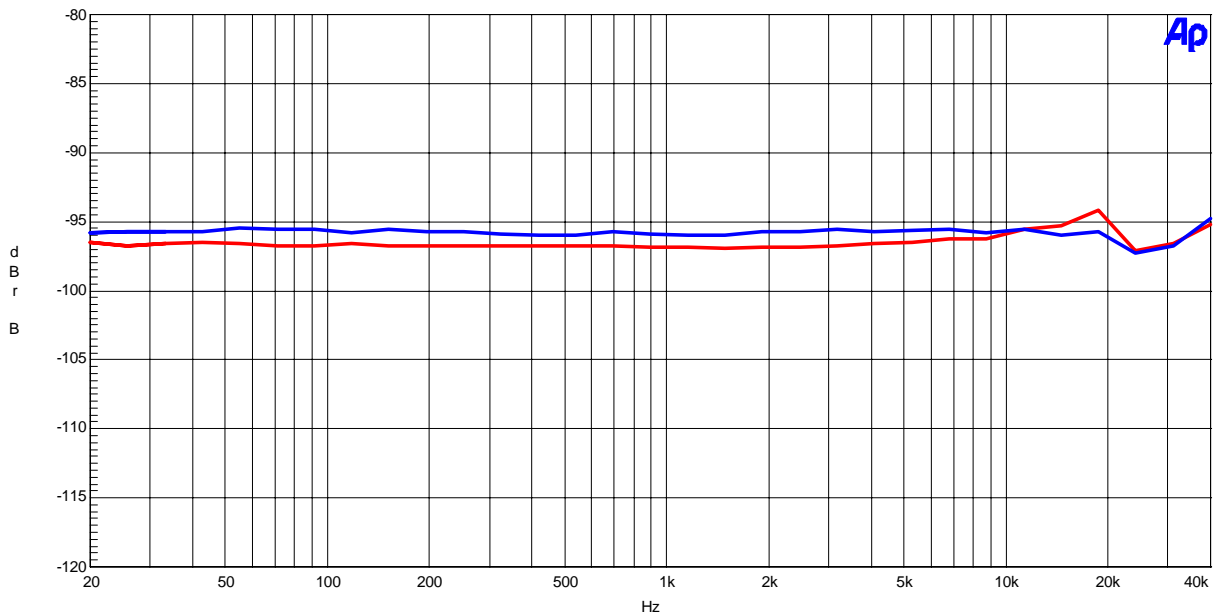
AK4626A DAC THD+N vs Input Level
AVDD=DVDD=TVDD=5V, fs=96kHz, fin=1kHz



THD + N vs Amplitude (fin=1kHz)

AKM

AK4626A DAC THD+N vs Input Frequency
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=0dBFS

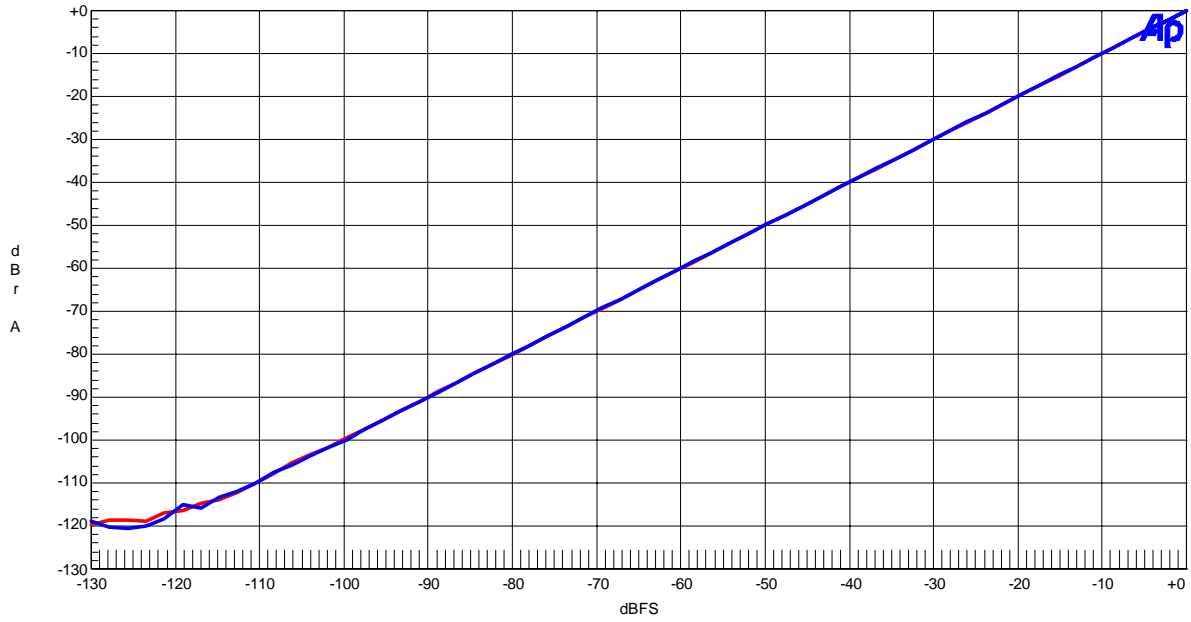


THD + N vs Input Frequency (Input=0dBFS)

(DAC fs=96kHz)

AKM

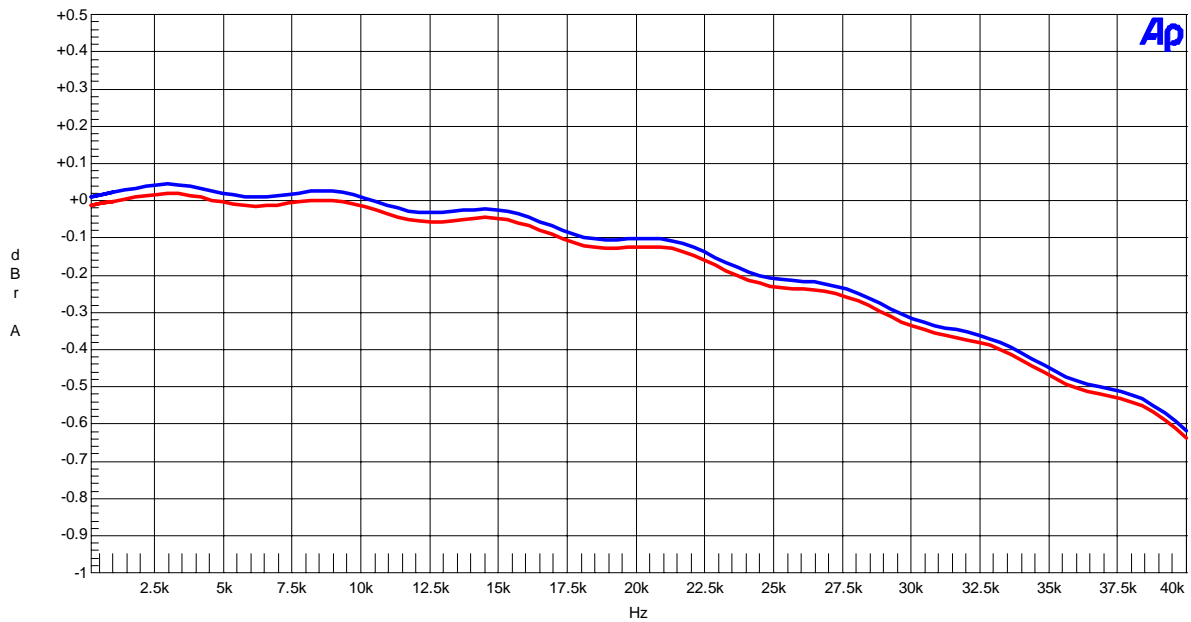
AK4626A Linearity
AVDD=DVDD=TVDD=5V, fs=96kHz, fin=1kHz



Linearity (fin=1kHz)

AKM

AK4626A Frequency Response
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=0dBFS

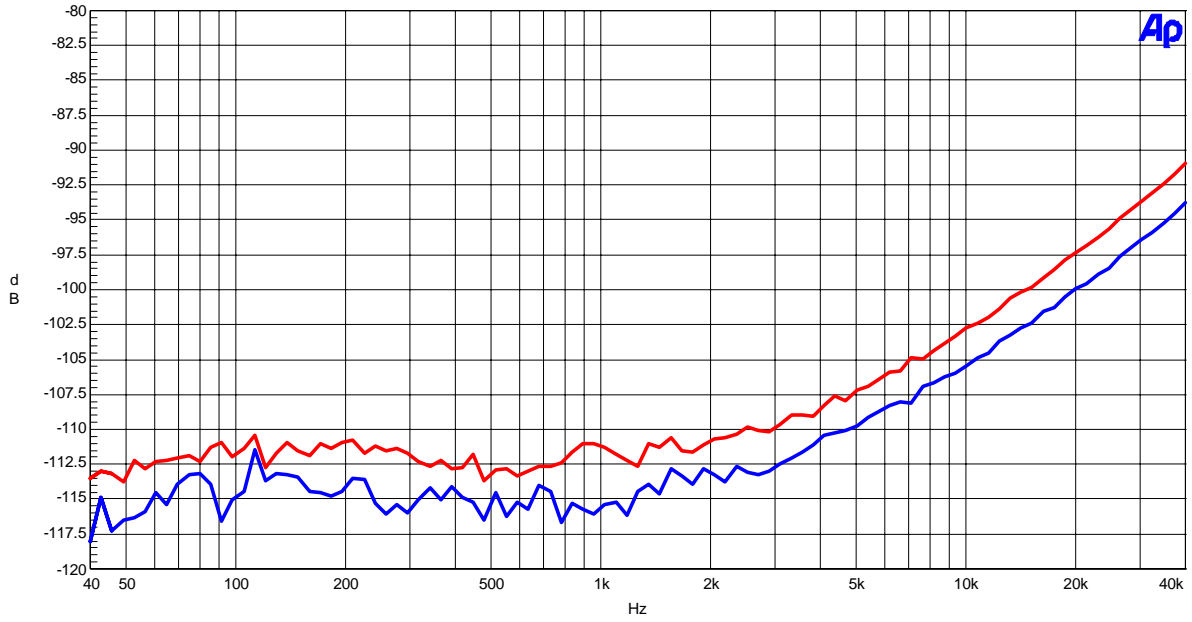


.Frequency Response (Input Level=0dBFS)
(including external RC filter)

(DAC fs=96kHz)

AKM

AK4626A Crosstalk(Upper@1kHz; Lch-->Rch, Lower@1kHz; Rch-->Lch)
AVDD=DVDD=TVDD=5V, fs=96kHz, Input Level=0dBFS



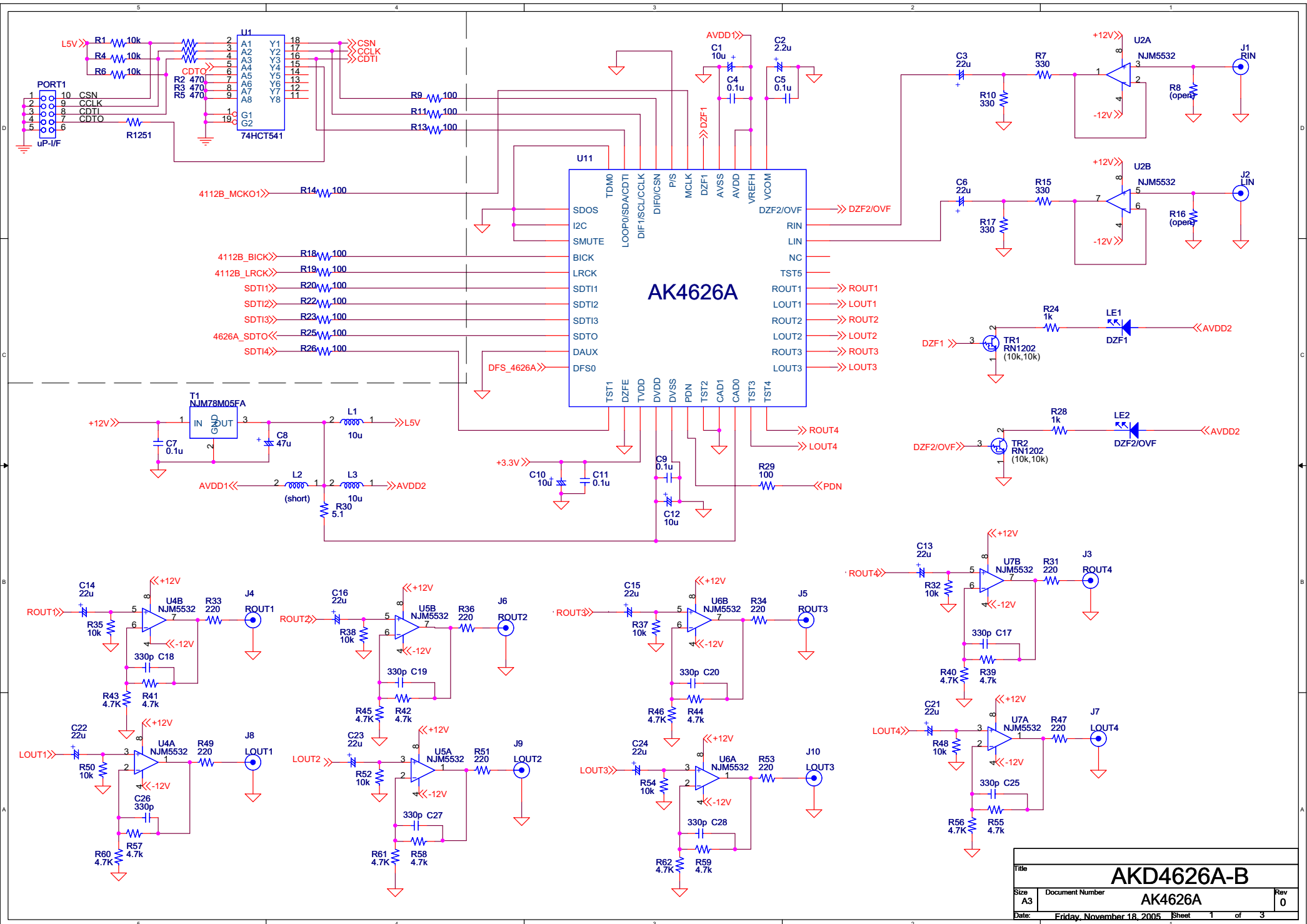
Crosstalk (Blue= Rch, Red= Lch)

Revision History

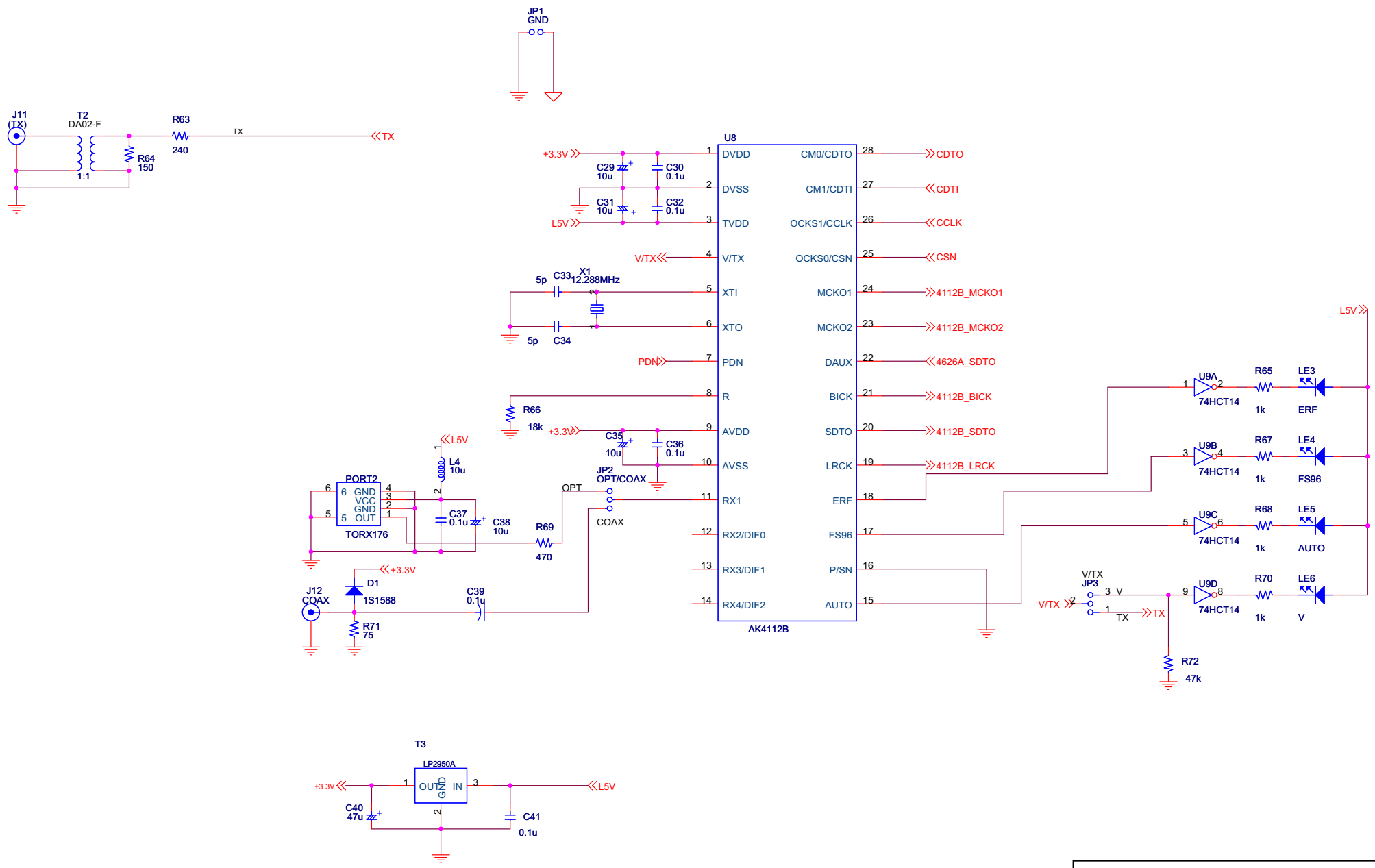
Date (YY/MM/DD)	Manual Revision	Board Revision	Reason	Contents
05/11/18	KM079800	0	First Edition	

IMPORTANT NOTICE

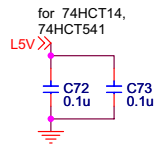
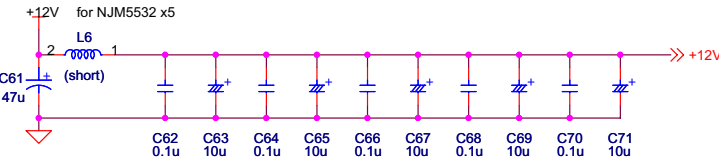
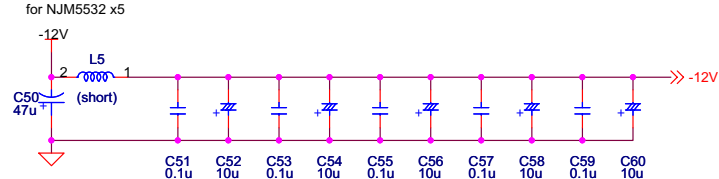
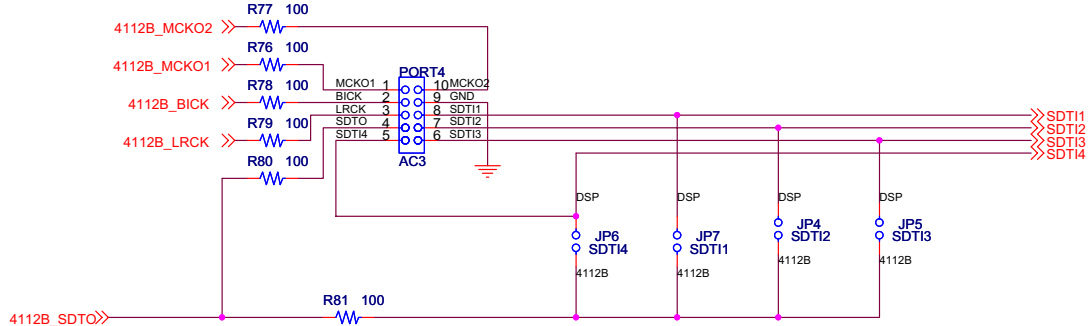
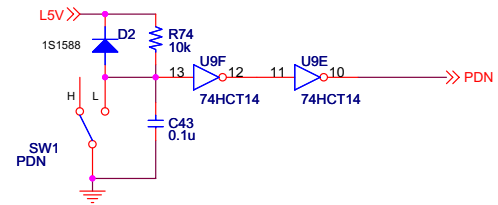
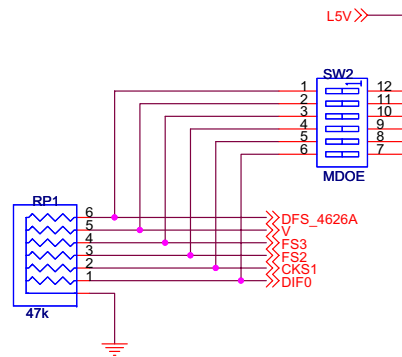
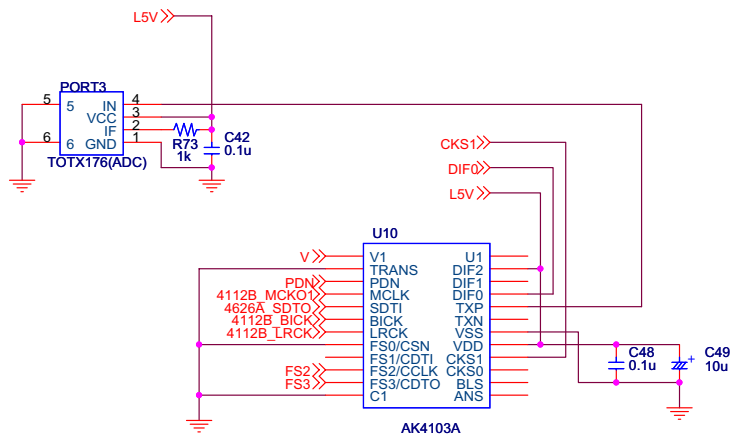
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Size	Document Number	AK4626A	
A3	Date:	Friday, November 18, 2005	Sheet 1 of 3
			Rev 0

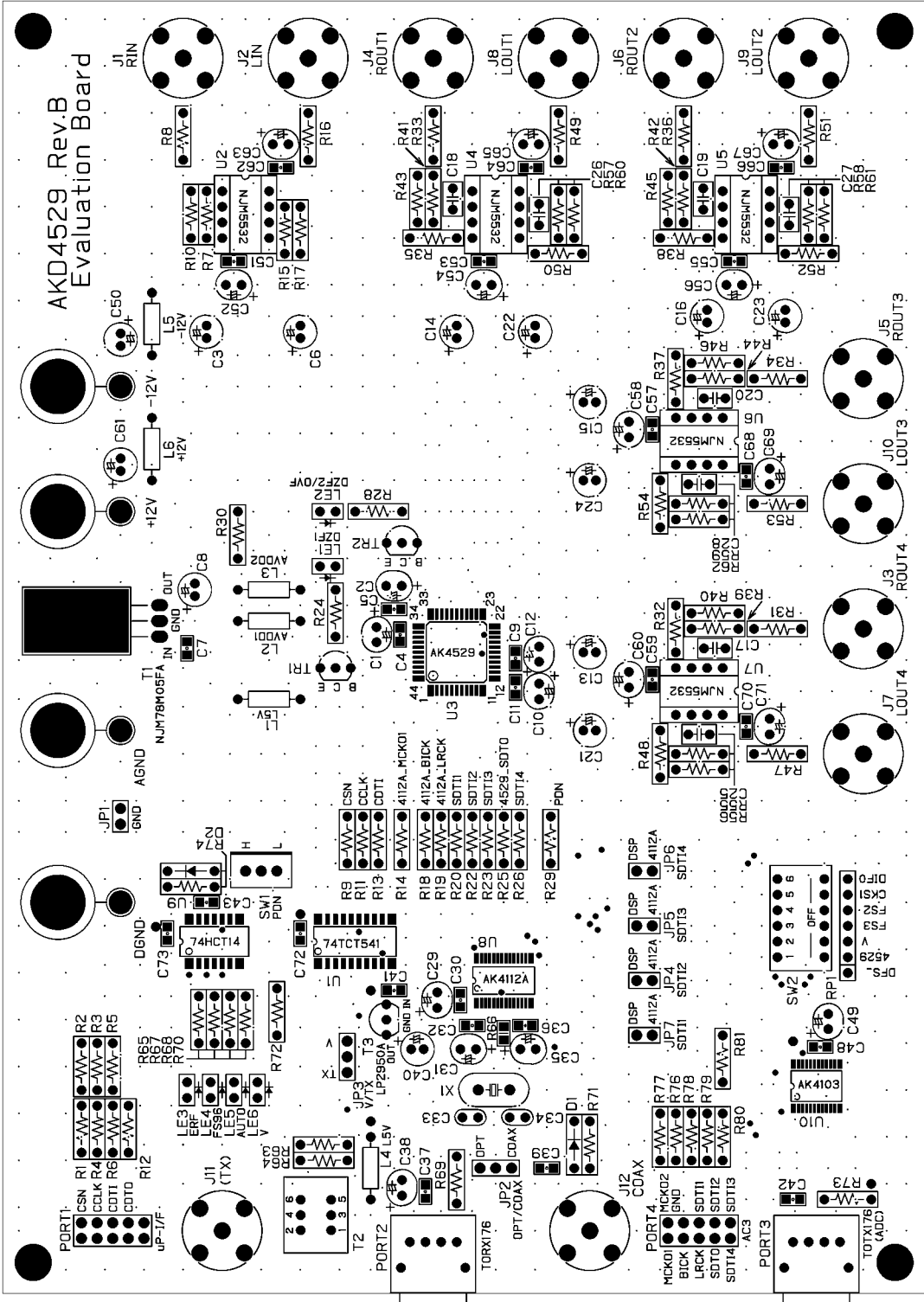


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Size	Document Number	AK4112B			Rev
A3					0
Date:	Friday, November 18, 2005	Sheet	2	of	3

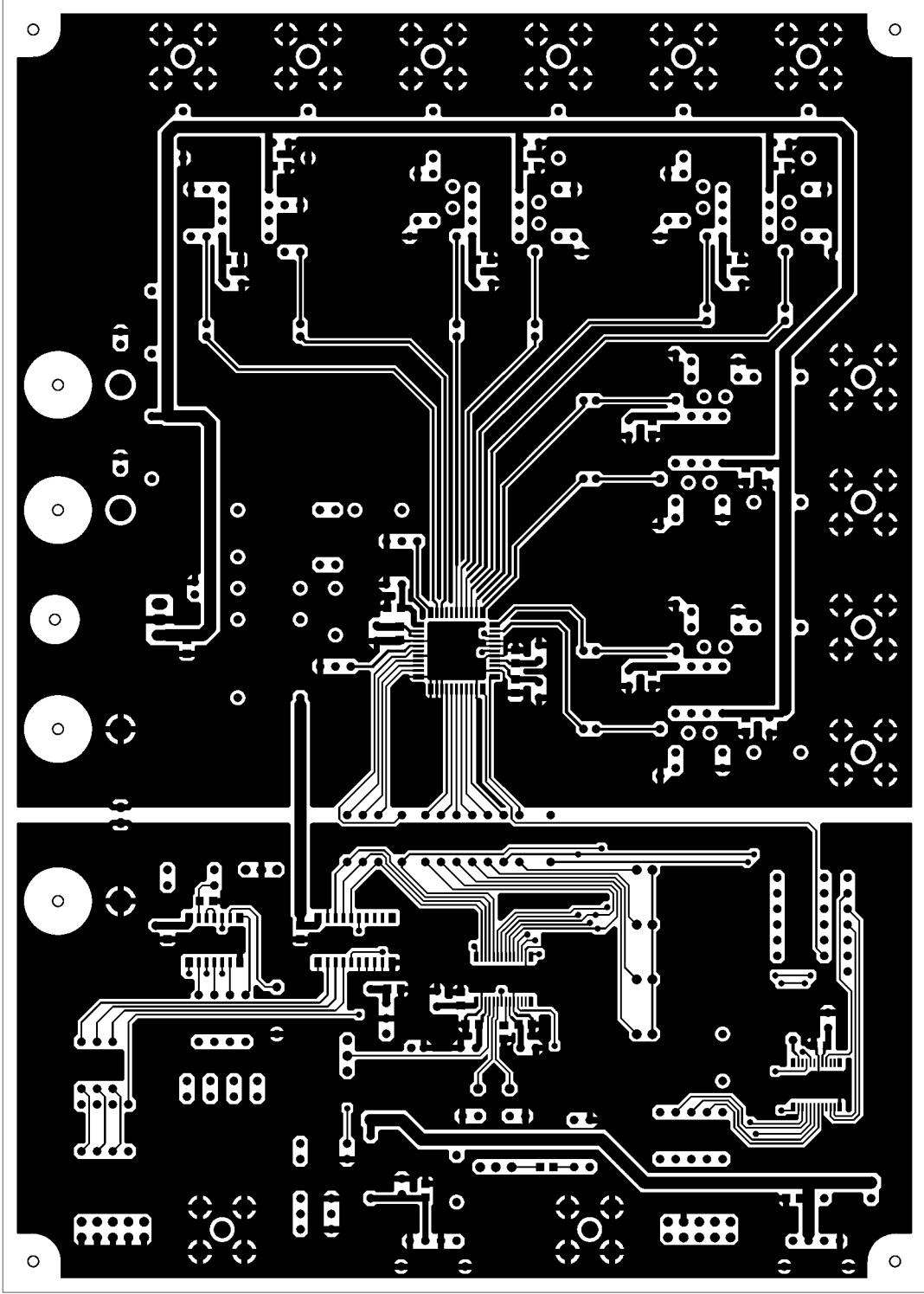


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Size	Document Number	Interface			Rev
A3					0
Date:	Friday, November 18, 2005	Sheet	3	of	3

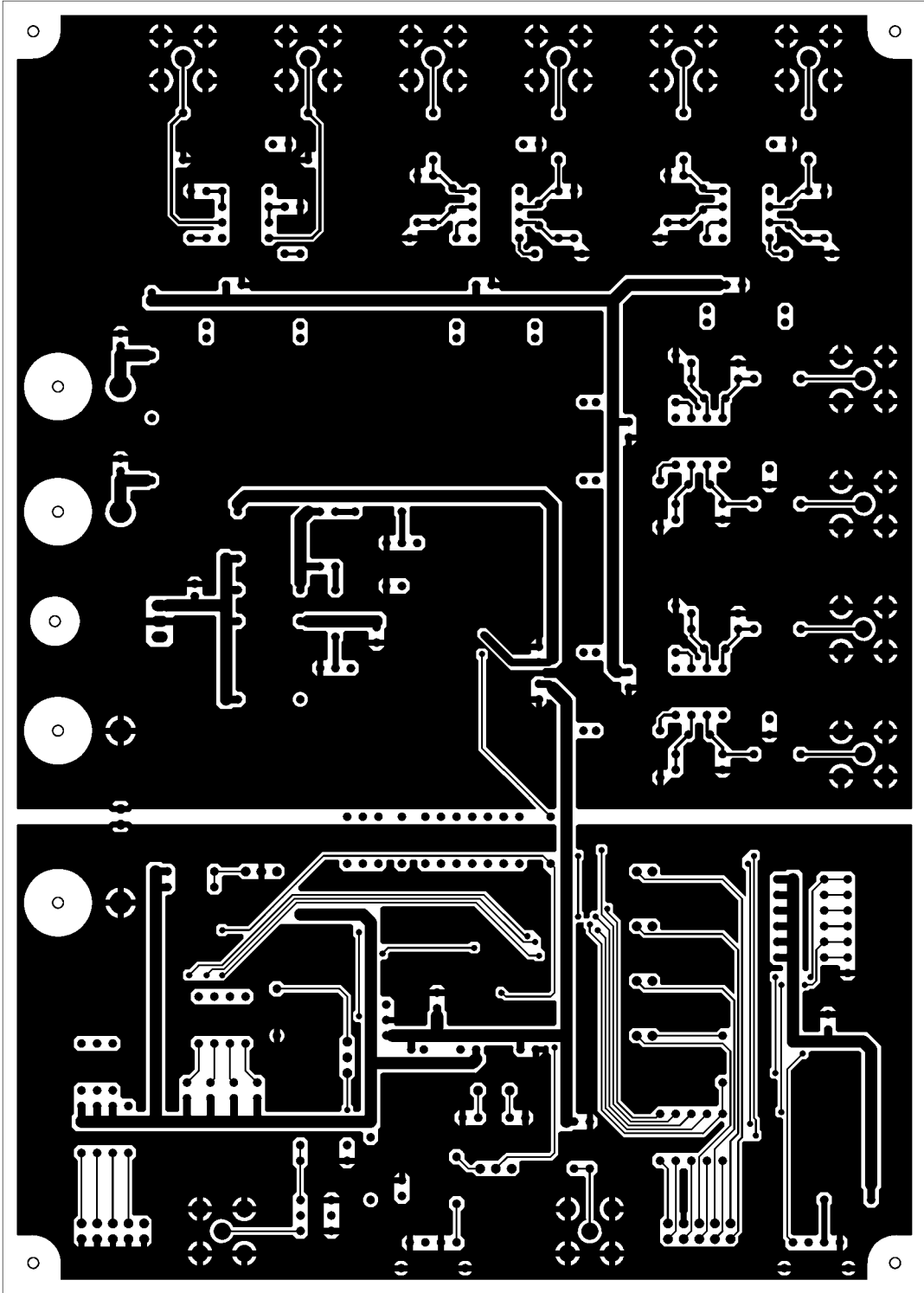
AKD4529 Rev.B Evaluation Board



AKD4529 Rev.B L1 SR SILK



AKD4529 Rev.B L1



AKD4253A Rev.B FS