



AK4637 Audio Driver

ALSA Linux Driver

GENERAL DESCRIPTION

This is an AK4637 Linux Audio driver manual. The AK4637 audio driver is developed with Linux 3.18.25 and used Advance Linux Sound Architecture ALSA. This driver supports MIC/Line recording and playback from Speaker/Line, Mixer Control and so on.

FEATURES

1. Kernel: Linux 3.18.XX, 4.4.XX, 4.9.XX
2. Architecture: ALSA
3. Recording Function:
 - Monaural MIC Input
 - Monaural Line Input
 - Monaural Digital MIC Input
4. Playback Function:
 - Speaker Amp Output
 - Line-Output
5. Mixer Function:
 - Mic Gain Control
 - Input Digital Volume Control
 - Speaker Output Volume Control
 - Monaural Lineout Volume Control
 - Digital Output Volume Control
 - Beep Volume Control
 - Programmable Filter Output Volume Control
 - DMCLK pin Output Clock (for Digital MIC) Control
 - Digital MIC Select Control
 - BICK Output Frequency Control
 - FCK BICK Output Control
 - Input/Digital Volume Control (Independent/Dependent)
 - High Pass Filter Control
 - Low Pass Filter Control
 - 5 Band Equalizer Control
 - Auto Level Control (ALC)
 - Soft Mute Control
6. Path & Switch Function:
 - MIC MUX Control
 - AIN MUX Control
 - AIN Mic Bias MUX Control
 - ADC (ADC Path Enable) Control
 - DMIC (Digital MIC Path Enable) Control
 - PFIL MUX Control
 - PFSDO MUX Control
 - PFDAC MUX Control
 - SPKLO MUX Control
 - SPKLO Mixer DACS Control
 - SPKLO Mixer BEEPS Control
7. Sampling Frequency:
8kHz, 11.025kHz, 16kHz, 22.05kHz, 32kHz, 44.1kHz, 48kHz

CONNECTION

Figure 1 shows the connection between the AK4637 and Application Processor.

Audio I/F: I2S

AK4637 Audio CODEC Clock Mode: EXT Slave Mode, or PLL Mode (Reference Clock: BICK 32fs, BICK 64fs, MCLK)

Control I/F: I2C I/F

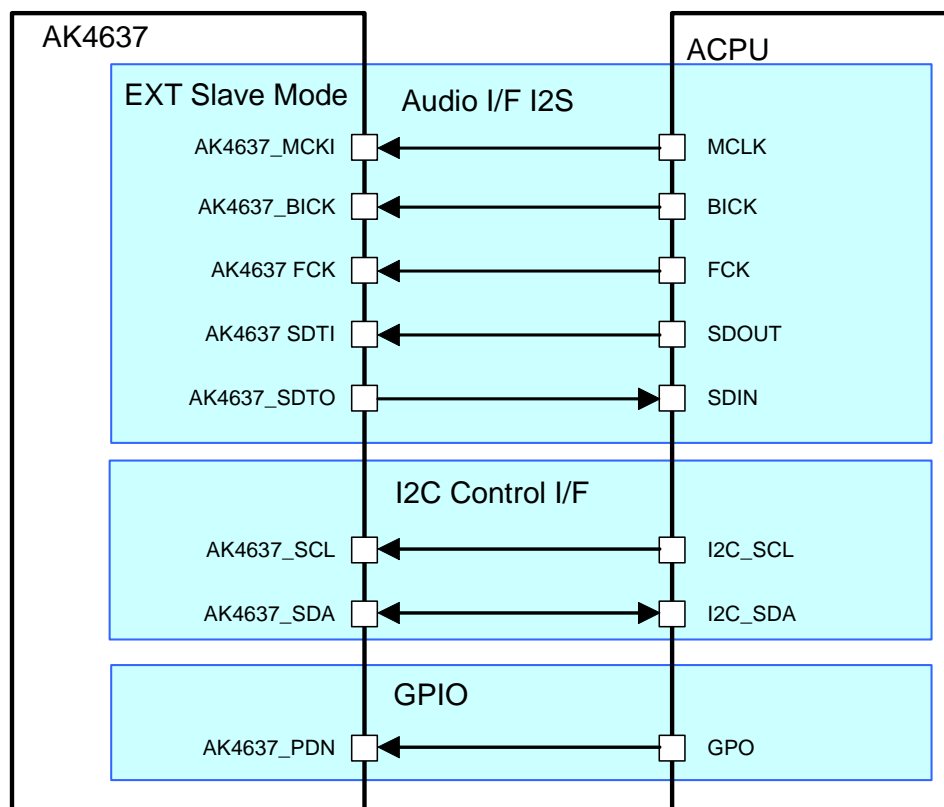


Figure 1. Connection with AK4637 and CPU.

Note. In case of BICK PLL slave mode, MCKI pin should not be connected to MCLK of CPU and be connected to GND.

Note. Select the following “#define” according to board version or clock mode in ak4637.h.

~ Clock Mode ~

[External Slave Mode]

```
//#define PLL_16BICK_MODE
//#define PLL_32BICK_MODE
//#define PLL_64BICK_MODE
//#define PLL_MCLK_MODE
```

[BICK 16fs Mode]

```
#define PLL_16BICK_MODE
//#define PLL_32BICK_MODE
//#define PLL_64BICK_MODE
//#define PLL_MCLK_MODE
```

[BICK 32fs Mode]

```
//#define PLL_16BICK_MODE
#define PLL_32BICK_MODE
//#define PLL_64BICK_MODE
//#define PLL_MCLK_MODE
```

[BICK 64fs Mode]

```
//#define PLL_16BICK_MODE
//#define PLL_32BICK_MODE
#define PLL_64BICK_MODE
//#define PLL_MCLK_MODE
```

[MCLK Mode]

```
//#define PLL_16BICK_MODE
//#define PLL_32BICK_MODE
//#define PLL_64BICK_MODE
#define PLL_MCLK_MODE
```

Set the suitable reference clock frequency to “AK4637_PLL_MCLK_FREQ” at “PLL_MCLK_Mode”.
Refer to the following. (Default setting is 12MHz.)

```
#define AK4637_PLL_11_2896MHZ (4 << 4)
#define AK4637_PLL_12MHZ      (6 << 4)
#define AK4637_PLL_12_288MHZ (5 << 4)
#define AK4637_PLL_13_5MHZ    (12 << 4)
#define AK4637_PLL_24MHZ      (7 << 4)
#define AK4637_PLL_27MHZ      (13 << 4)

#define AK4637_PLL_MCLK_FREQ AK4637_PLL_12MHZ
```

SOURCE CODE

Followings are the AK4637 ALSA driver components in the Linux source tree.

ALSA Component	Source Path
Codec Driver	(kernel folder)\sound\soc\codecs\ak4637.h (kernel folder)\sound\soc\codecs\ak4637.c

[Example of Device tree setting]

```
ak4637@12{
    compatible = "akm,ak4637";
    reg = <0x12>;
    ak4637, pdn-gpio = <&gpioname XX XX>; // If PDN GPIO pin is used
};
```

Note. PDN pin must be set “L” when power supplies are turned on, and PDN pin must be set “H” before driver probe function is called.

Followings are the test application components in the Android source tree.

Component	Source Path
Test Application	(Android folder)\external\ak4637\Android.mk (Android folder)\external\ak4637\ak4637test.c
Control files	(Android folder)\external\ak4637\ak4637ctl\ak4637ctl.txt

[Generator of Binary file for Filter/Equalizer register bits Code]

Component	Exe file
Generator	WindowsApp\akd4637-b.exe (*) This works on Windows 7 and Windows 8.

FUNCTIONS

1- Mixer Control

The mixer control of tiny ALSA can control the following functions.

1-1. Volume Control

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
Mic Gain Control	02	MGAIN3-0 (*)	10	+30dB
			9	+27dB
			8	+24dB
			7	+21dB
			6	+18dB
			5	+15dB
			4	+12dB
			3	+9dB
			2	+6dB
			1	+3dB
			0	0dB
Digital Input Volume	0D	IVOL7-0	241	36dB
			240	35.625dB
			239	35.25dB
				:
			226	30.375dB
			225	30.0dB
			224	29.625dB
				:
			146	0.375dB
			145	0.0dB
			144	-0.375dB
				:
			6	-52.125dB
			5	-52.5dB
			4-0	MUTE
Speaker Output Volume	03	SPKG1-0	3	14.9dB
			2	11.1dB
			1	8.4dB
			0	6.4dB
Monaural Lineout Volume	04	LVCM1-0	3	+4dB/3.0-3.6V
			2	+2dB/2.8-3.6V
			1	+2dB/3.0-3.6V
			0	0dB/2.8-3.6V
Digital Output Volume	10	DVOL7-0 (**)	204	12dB
			203	11.5dB
			202	11.0dB
			:	:
			180	0.0dB
			:	:
			2	-89.0dB
			1	-89.5dB
			0	MUTE

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
Beep Volume Control	0F	BPLVL3-0 (**)	9	0dB
			8	-6dB
			7	-12dB
			6	-18dB
			5	-24dB
			4	-30dB
			3	-33dB
			2	-36dB
			1	-39dB
			0	-42dB
Programmable Filter Output Volume	18	PFVOL1-0 (**)	3	0dB
			2	-6dB
			1	-12dB
			0	-18dB

Note. The value of register bits with (*) are different from the value of ALSA mixer control.

Note. The value of register bits with (**) are reversed with the value of ALSA mixer control.

1-2. Clock Control

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
DMCLK pin Output Clock	08	DCLKE	0	Low
			1	64fs
Digital MIC Data Select	08	DCLKP	0	Low
			1	High
BICK Output Frequency in Master Mode	05	BCKO1-0	1	16fs
			2	32fs
			3	64fs
FCK BICK Output in Master Mode	05	CKOFF	0	Output
			1	Stop

1-3. Filter Control

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
High Path Filter 1 Fc	16	HPFC1-0	0	3.7Hz
			1	14.8Hz
			2	118.4Hz
			3	236.8Hz
High Path Filter 1	16	HPFAD	0	Off
			1	On
High Path Filter 2	17	HPF	0	Off
			1	On
Low Path Filter	17	LPF	0	Off
			1	On

Note. Frequency settings are at sampling frequency = 48kHz. These frequencies are proportional to the sampling frequency.

1-4. Equalizer Control

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
5 Band Equalizer 1	21	EQ1	0	Off
			1	On
5 Band Equalizer 2	21	EQ2	0	Off
			1	On
5 Band Equalizer 3	21	EQ3	0	Off
			1	On
5 Band Equalizer 4	21	EQ4	0	Off
			1	On
5 Band Equalizer 5	21	EQ5	0	Off
			1	On
5 Band Equalizer 2 Gain Enable	11	EQC2	0	Off
			1	On
5 Band Equalizer 3 Gain Enable	11	EQC3	0	Off
			1	On
5 Band Equalizer 4 Gain Enable	11	EQC4	0	Off
			1	On
5 Band Equalizer 5 Gain Enable	11	EQC5	0	Off
			1	On
5 Band Equalizer 2 Gain Control	12	EQ2G5-0	63	0dB
			62	-0.17dB
			61	-0.31dB
			:	:
			2	-27.34dB
			1	-31.26dB
			0	MUTE
5 Band Equalizer 3 Gain Control	13	EQ3G5-0	63	0dB
			62	-0.17dB
			61	-0.31dB
			:	:
			2	-27.34dB
			1	-31.26dB
			0	MUTE
5 Band Equalizer 4 Gain Control	14	EQ4G5-0	63	0dB
			62	-0.17dB
			61	-0.31dB
			:	:
			2	-27.34dB
			1	-31.26dB
			0	MUTE
5 Band Equalizer 5 Gain Control	15	EQ5G5-0	63	0dB
			62	-0.17dB
			61	-0.31dB
			:	:
			2	-27.34dB
			1	-31.26dB
			0	MUTE

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
5 Band Equalizer 2 Transition Time	12	EQ2T1-0	0	256/fs
			1	2048/fs
			2	8192/fs
			3	16384/fs
5 Band Equalizer 3 Transition Time	13	EQ3T1-0	0	256/fs
			1	2048/fs
			2	8192/fs
			3	16384/fs
5 Band Equalizer 4 Transition Time	14	EQ4T1-0	0	256/fs
			1	2048/fs
			2	8192/fs
			3	16384/fs
5 Band Equalizer 5 Transition Time	15	EQ5T1-0	0	256/fs
			1	2048/fs
			2	8192/fs
			3	16384/fs

1-5. ALC Control

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
ALC Recovery Gain Step	0B	RGAIN2-0	0	0.00424dB_1/fs
			1	0.00212dB_1/fs
			2	0.00106dB_1/fs
			3	0.00106dB_2/fs
			4	0.00106dB_4/fs
			5	0.00106dB_8/fs
			6	0.00106dB_16/fs
			7	0.00106dB_32/fs
ALC Fast Recovery Attenuation Amount	09	RFATT	0	4/fs
			1	16/fs
ALC Fast Recovery Enable	09	FRN	0	Off
			1	On
ALC Equalizer Frequency Setting	0A	EQFC1-0	0	8kHz_12kHz
			1	12kHz_24kHz
			2	24kHz_48kHz
ALC Recovery Waiting Period	0A	WTM1-0	0	128/fs
			1	256/fs
			2	512/fs
			3	1024/fs
ALC Fast Recovery Speed	0A	RFST1-0	0	0.0032dB
			1	0.0042dB
			2	0.0064dB
			3	0.0127dB
ALC Equalizer Enable	0B	ALCEQN	0	Off
			1	On
ALC for Recording	0B	ALC	0	Off
			1	On

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
ALC Limiter Detection Level	0B	LMTH2-0	0	-2.5_-4.1dBFS
			1	-2.5_-3.3dBFS
			2	-4.1_-6.0dBFS
			3	-4.1_-5.0dBFS
			4	-6.0_-8.5dBFS
			5	-6.0_-7.2dBFS
			6	-8.5_-12.0dBFS
			7	-8.5_-10.1dBFS
ALC Recovery Reference Value	0C	REF7-0	241	+36.0dB
			240	+35.625dB
			239	+35.25dB
			:	:
			225	+30.0dB
			:	:
			146	+0.375dB
			145	0.0dB
			144	-0.375dB
			:	:
			6	-52.125dB
			5	-52.5dB
			4-0	MUTE

1-6. Other Control

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
MPWR pin Output Voltage	03	MICL	0	2.4V
			1	2.0V
Thermal Shutdown Auto Power Up	07	THDET	0	Off
			1	On
ADC Initialization Cycle	09	ADRST1-0	0	1059/fs
			1	267/fs
			2	531/fs
			3	135/fs
Output Digital Volume Transition Time	09	DVTM	0	816/fs
			1	204/fs
Input Digital Volume Transition Time	0A	IVTM	0	236/fs
			1	944/fs
BEEP Input Amp Vcom Setting	0F	BPVCM	0	1.15V
			1	1.65V

1-7. Path Control

Control Name	Addr [Hex]	Register bit	Value[Dec]	Setting
MIC MUX	08	DMIC	0	AMIC
			1	DMIC
AIN Mic Bias MUX	02	PMMP	0	AIN
			1	Mic Bias
AIN MUX	03	MDIF	0	Single
			1	Differential
ADC SW	-	-	0	Off
			1	On
DMIC SW	-	-	0	Off
			1	On
PFIL MUX	18	ADCPF	0	SDTI
			1	ADC
PFSDO MUX	18	PFSDO	0	ADC
			1	PFIL
PFDAC MUX	18	PFDAC1-0	0	SDTI
			1	PFVOL
			2	(SDTI+PFVOL)/2
SPKLO MUX	00	LOSEL	0	Speaker
			1	Line
SPKLO Mixer DACS	02	DACS	0	Off
			1	On
SPKLO Mixer DACL	04	DACL	0	Off
			1	On
SPKLO Mixer BEEPS	0F	BEEPS	0	Off
			1	On

2- Firmware Register Write Control

The ALSA Mixer control of “**** Firmware” writes external binary file data for digital filter co-efficient.

“data*” writes “ak4637_***_data*.bin” to each register bits. “ak4637_***_data*.bin” should be put on the following folder.

\system\vendor\firmware

2-1. Filter Co-efficient file download

Control Name	Addr [Hex]	Register bit	Value [Dec]	Setting	Download File
High Pass Filter 2 Firmware	19-1C (n=19)	F1A13-0 F1B13-0	0	default	-
			1	data1	ak4637_hpf2_data1.bin
			2	data2	ak4637_hpf2_data2.bin
			3	data3	ak4637_hpf2_data3.bin
			4	data4	ak4637_hpf2_data4.bin
			5	data5	ak4637_hpf2_data5.bin
Low Pass Filter Firmware	1D-20 (n=1D)	F2A13-0 F2B13-0	0	default	-
			1	data1	ak4637_lpf_data1.bin
			2	data2	ak4637_lpf_data2.bin
			3	data3	ak4637_lpf_data3.bin
			4	data4	ak4637_lpf_data4.bin
			5	data5	ak4637_lpf_data5.bin

[File Format]

D7-0 of Addr (n), D7-0 of Addr (n+1), ... , D7-0 of Addr (n+3) // 4byte

2-2. Equalizer Co-efficient file download

Control Name	Addr [Hex]	Register bit	Value [Dec]	Setting	Download File
5 Band Equalizer 1 Firmware	22-27 (n=22)	E1A15-0 E1B15-0 E1C15-0	0	default	-
			1	data1	ak4637_eq1_data1.bin
			2	data2	ak4637_eq1_data2.bin
			3	data3	ak4637_eq1_data3.bin
			4	data4	ak4637_eq1_data4.bin
			5	data5	ak4637_eq1_data5.bin
5 Band Equalizer 2 Firmware	28-2D (n=28)	E2A15-0 E2B15-0 E2C15-0	0	default	-
			1	data1	ak4637_eq2_data1.bin
			2	data2	ak4637_eq2_data2.bin
			3	data3	ak4637_eq2_data3.bin
			4	data4	ak4637_eq2_data4.bin
			5	data5	ak4637_eq2_data5.bin
5 Band Equalizer 3 Firmware	2E-33 (n=2E)	E3A15-0 E3B15-0 E3C15-0	0	default	-
			1	data1	ak4637_eq3_data1.bin
			2	data2	ak4637_eq3_data2.bin
			3	data3	ak4637_eq3_data3.bin
			4	data4	ak4637_eq3_data4.bin
			5	data5	ak4637_eq3_data5.bin
5 Band Equalizer 4 Firmware	34-39 (n=34)	E4A15-0 E4B15-0 E4C15-0	0	default	-
			1	data1	ak4637_eq4_data1.bin
			2	data2	ak4637_eq4_data2.bin
			3	data3	ak4637_eq4_data3.bin
			4	data4	ak4637_eq4_data4.bin
			5	data5	ak4637_eq4_data5.bin
5 Band Equalizer 5 Firmware	3A-3F (n=3A)	E5A15-0 E5B15-0 E5C15-0	0	default	-
			1	data1	ak4637_eq5_data1.bin
			2	data2	ak4637_eq5_data2.bin
			3	data3	ak4637_eq5_data3.bin
			4	data4	ak4637_eq5_data4.bin
			5	data5	ak4637_eq5_data5.bin

[File Format]

D7-0 of Addr (n), D7-0 of Addr (n+1), ... , D7-0 of Addr (n+5) // 6byte

3- Binary file generate soft for Firmware Register Write Control

This software can generate Filter and Equalizer code for AK4637 register bits.
These binary files are used as the firmware by AK4637 Linux kernel driver.
This software works on Windows 7 and Windows 8.

-Usage

Execute “akd4637.exe” on Windows 7 or 8. Then the window of AK4637control soft opens (Figure 2).

Click the “Digital Filter Setting” button in Figure 2. Then the new window in Figure 3 opens.

*Set the Filter or Equalizer co-efficient value in this window.

*you can confirm the Filter and Equalizer set value by clicking “Register Setting” button in Figure 2.

Click the “Binary for Linux” button in Figure 3. Then the binary file generate window in Figure 4 opens.

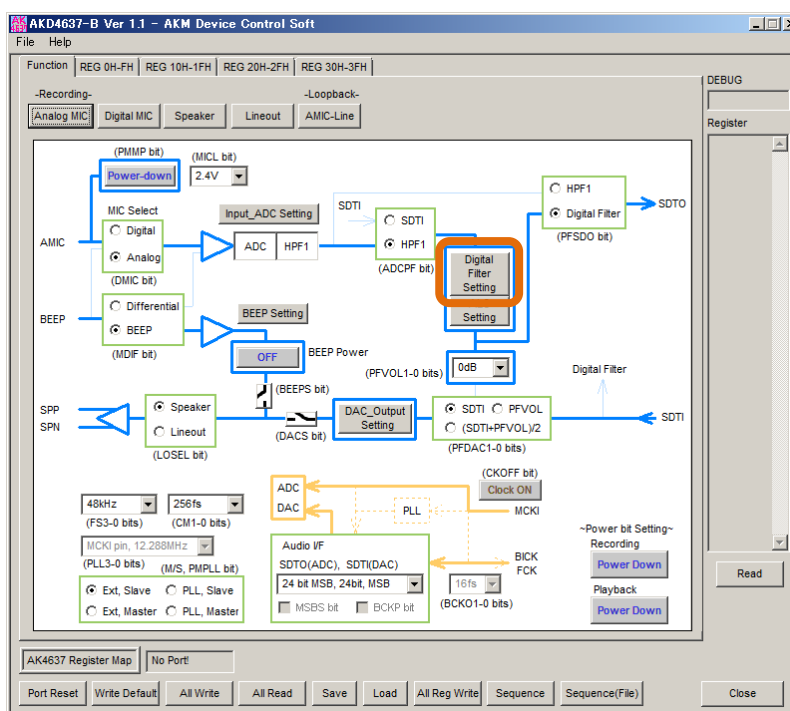


Figure 2. Main Window of Control Soft

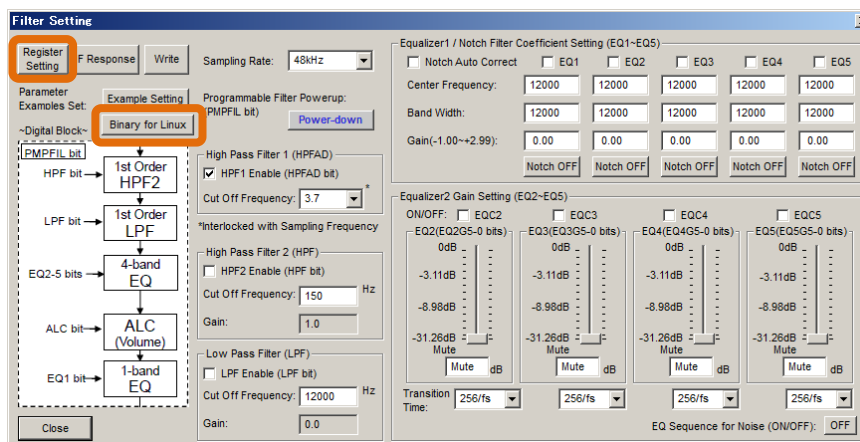


Figure 3. Filter Setting Window

-Description of the Binary file generate window.

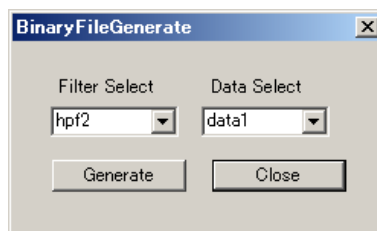


Figure 4. Binary File Generate Windowt

- [Filter select] : Selection of the Filter or Equalizer co-efficient value which is set by a control software.
- [File mode] : Selection of the file data to write.
- [Convert] : The file named “ak4637_***_data*.bin” is created.

4- Control soft for test

This is a software to test the Mixer Control of this driver in Android OS.
This works in the Terminal of Android OS.

4-1. Setting for Control soft

“ak4637test” executes CODEC Mixer Control and DSP Control according to contents in ak4637ctl.txt.

[Example of sequence setting in ak4637ctl.txt]

```
mode=1 " Playback Speaker "
  path="on"
    ctl name="PFDAC MUX" string="SDTI"
    ctl name="SPKLO MUX" string="Speaker"
    ctl name="SPKLO Mixer DACS" val="1"
  /path
  path="off"
    ctl name="SPKLO Mixer DACS" val="0"
  /path
/mode
```

[Format of ak4637ctl.txt]

```
# Mode Start Line Format
# 1-5 : mode=
# 6-8 : mode No
# 9- : Space and Comment
#
# ON Control
# Start
# path="on"
# Sequence
# ctl name="control name" string="selected mode"
# or
# ctl name="control name" val="value"
# or
# ctl name="control name" string="selected mode" val="hex value"
# End
# /path
#
# OFF Control
# Start
# path="off"
# Sequence
# ctl name="control name" string="selected mode"
# or
# ctl name="control name" val="value"
# End
# /path
#
# Mode End Line Format
# 1-5 : /mode
```

5- Usage

Copy “ak4637” folder to “android\external” folder and compile. Application of “ak4637test” will be made.

When ak4637test is executed as the following command, the controls in ak4637ctl.txt are executed.

```
ak4637test mode on
```

```
Mode : Sequence mode No
```

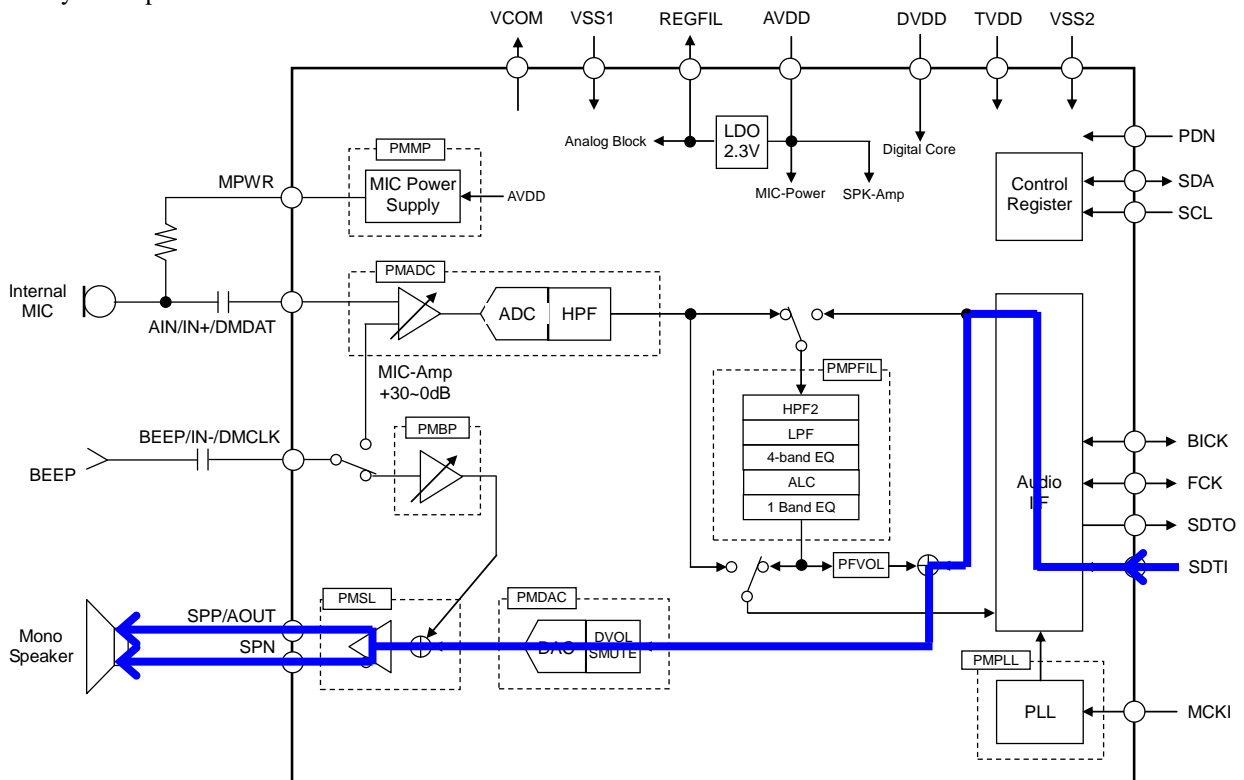
```
On : 1 : Control ON, 0 : Control OFF
```

It needs that the following files existed in the folder that ak4637test command is executed.

(1) ak4637ctl.txt

Path and Sequence

1. Playback Speaker



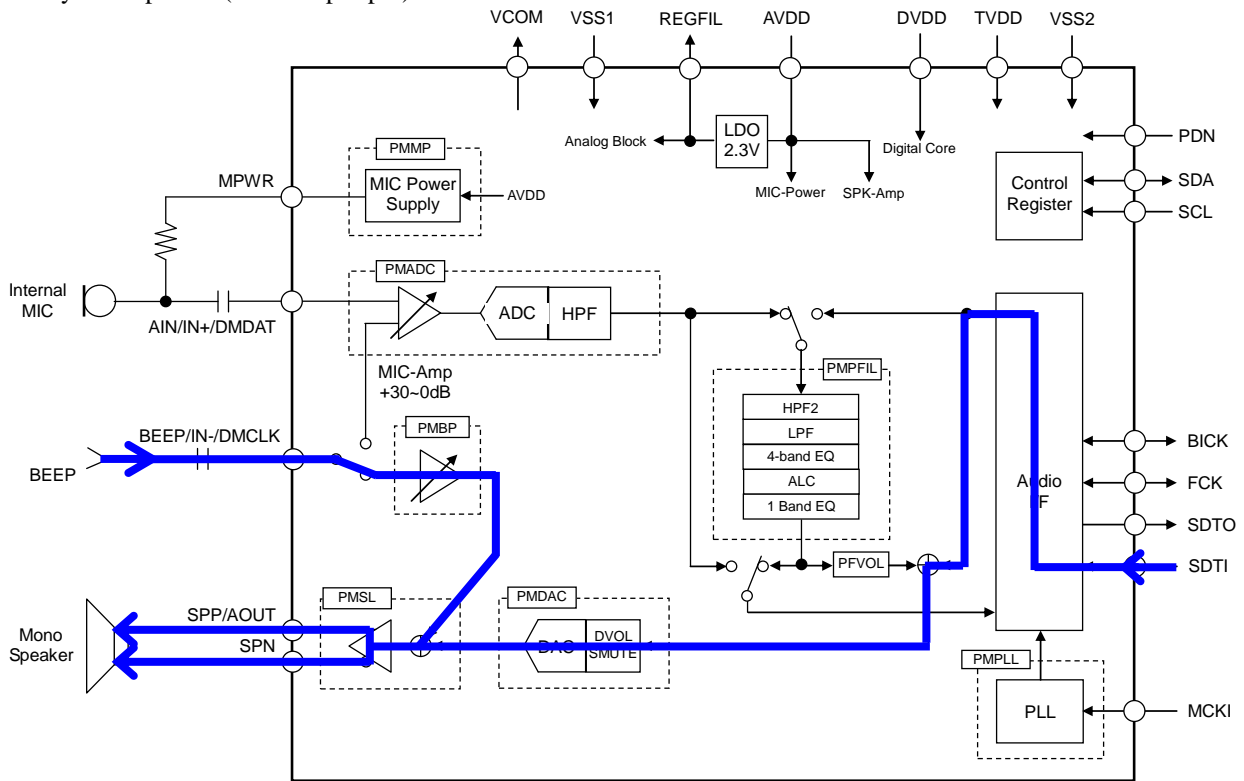
[Start Sequece]

```
path="on"
  ctl name="PFDAC MUX" string="SDTI"
  ctl name="SPKLO MUX" string="Speaker"
  ctl name="SPKLO Mixer DACS" val="1"
/path
```

[Stop Sequece]

```
path="off"
  ctl name="SPKLO Mixer DACS" val="0"
/path
```

2. Playback Speaker (Add Beep Input)



[Start Sequece]

```

path="on"
ctl name="PFDAC MUX" string="SDTI"
ctl name="SPKLO MUX" string="Speaker"
ctl name="SPKLO Mixer DACS" val="1"
ctl name="SPKLO Mixer BEEPS" val="1"
/path

```

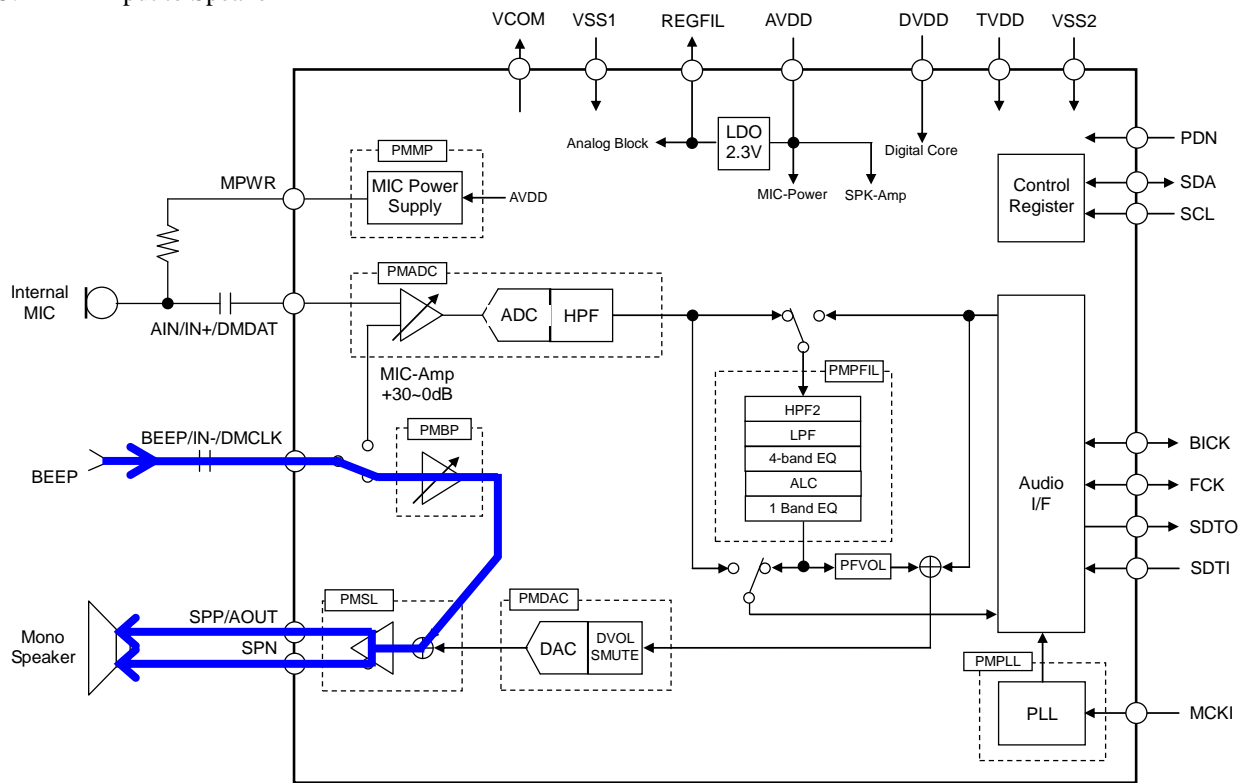
[Stop Sequece]

```

path="off"
ctl name="SPKLO Mixer DACS" val="0"
ctl name="SPKLO Mixer BEEPS" val="0"
/path

```

3. BEEP Input to Speaker



[Start Sequece]

```

path="on"
  ctl name="SPKLO MUX" string="Speaker"
  ctl name="SPKLO Mixer BEEPS" val="1"
/path

```

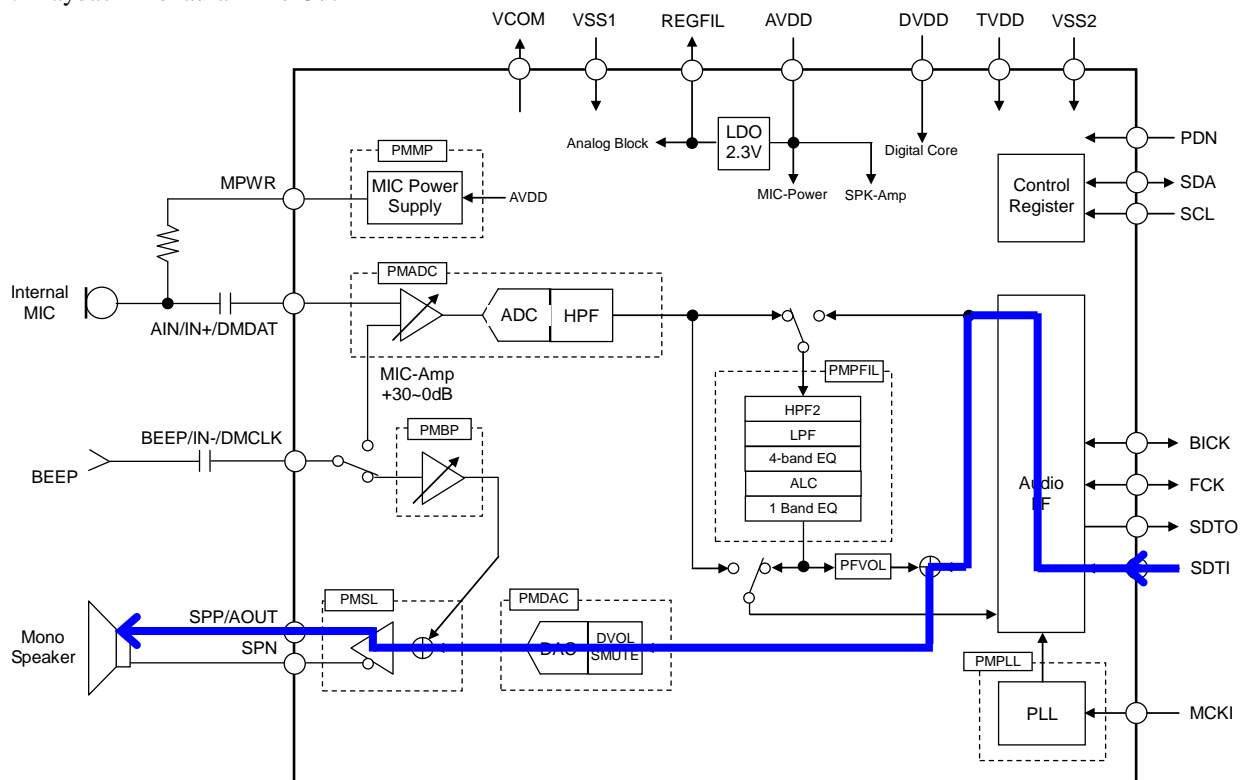
[Stop Sequece]

```

path="off"
  ctl name="SPKLO Mixer BEEPS" val="0"
/path

```

4. Playback Monaural Line Out



[Start Sequece]

path="on"

ctl name="PFDAC MUX" string="SDTI"

ctl name="SPKLO MUX" string="Line"

ctl name="SPKLO Mixer DACL" val="1"

/path

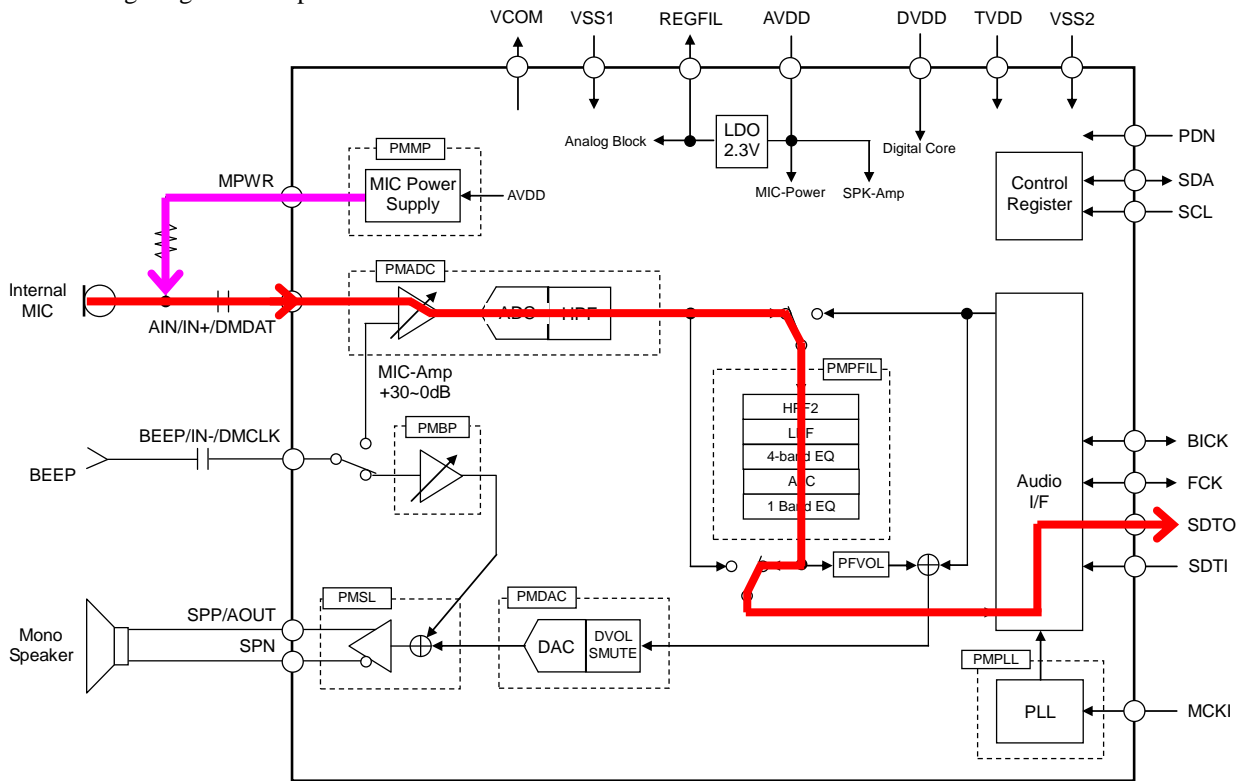
[Stop Sequece]

path="off"

ctl name="SPKLO Mixer DACL" val="0"

/path

5. Recording Single MIC Input



[Start Sequece]

```

path="on"
  ctl name="Mic Gain Control" val="6"
  ctl name="MIC MUX" string="AMIC"
  ctl name="AIN MUX" string="Single"
  ctl name="PFIL MUX" string="ADC"
  ctl name="PFSDO MUX" string="PFIL"
  ctl name="AIN Mic Bias MUX" string="Mic Bias"
  ctl name="ADC SW" string="On"
/path

```

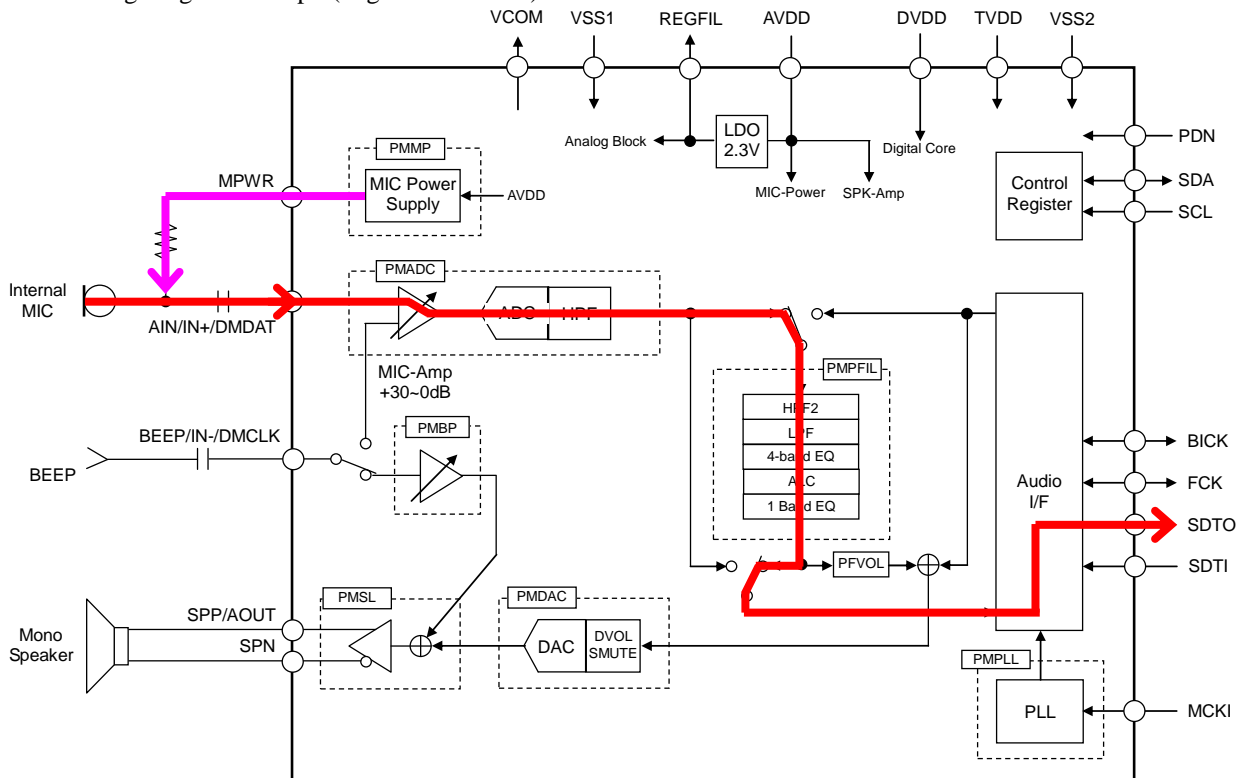
[Stop Sequece]

```

path="off"
  ctl name="Mic Gain Control" val="0"
  ctl name="ADC SW" string="Off"
  ctl name="AIN Mic Bias MUX" string="AIN"
/path

```

6. Recording Single MIC Input(Digital Filter: ON)



[Start Sequece]

path="on"

```

ctl name="Mic Gain Control" val="6"
ctl name="MIC MUX" string="AMIC"
ctl name="AIN MUX" string="Single"
ctl name="PFIL MUX" string="ADC"
ctl name="High Path Filter 2" val="1"
ctl name="Low Path Filter" val="1"
ctl name="ALC for Recording" val="1"
ctl name="PFSDO MUX" string="PFIL"
ctl name="AIN Mic Bias MUX" string="Mic Bias"
ctl name="ADC SW" string="On"

```

/path

[Stop Sequece]

path="off"

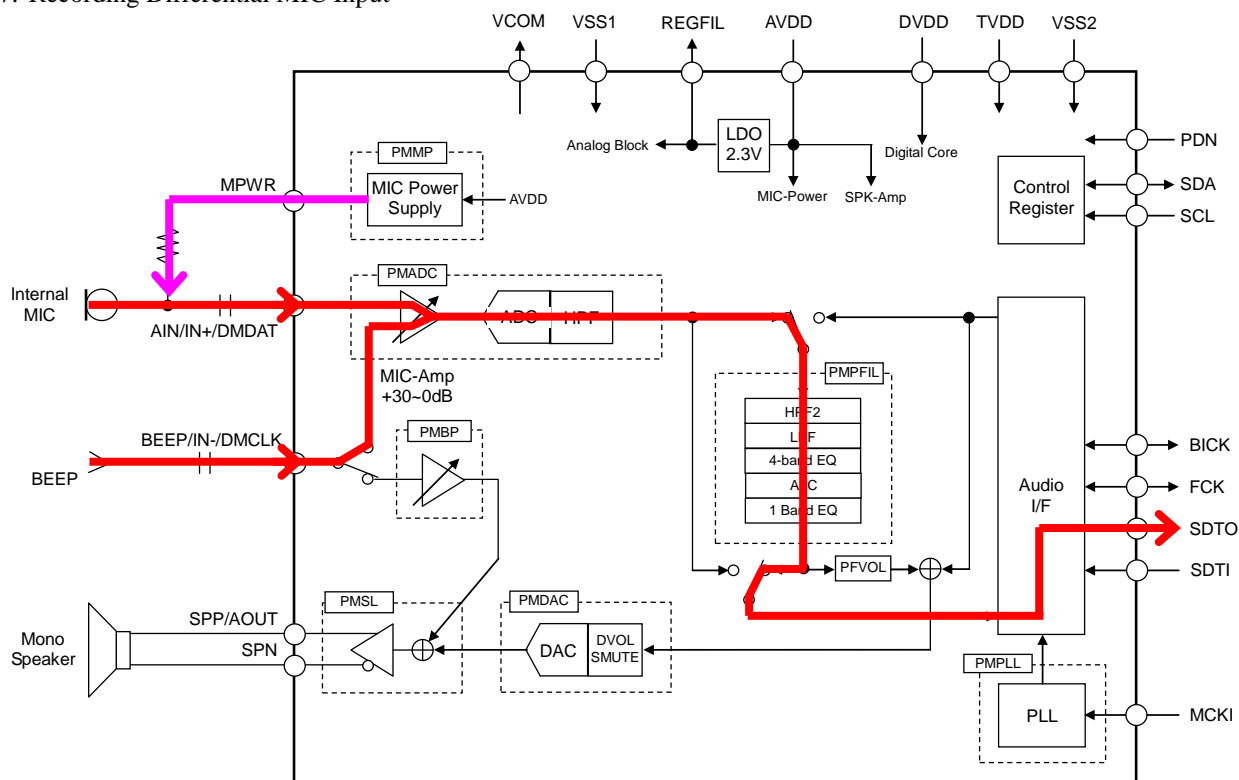
```

ctl name="Mic Gain Control" val="0"
ctl name="ADC SW" string="Off"
ctl name="AIN Mic Bias MUX" string="AIN"
ctl name="High Path Filter 2" val="0"
ctl name="Low Path Filter" val="0"
ctl name="ALC for Recording" val="0"

```

/path

7. Recording Differential MIC Input



[Start Sequece]

path="on"

```

ctl name="Mic Gain Control" val="6"
ctl name="MIC MUX" string="AMIC"
ctl name="AIN MUX" string="Differential"
ctl name="AIN Mic Bias MUX" string="AIN"
ctl name="PFIL MUX" string="ADC"
ctl name="PFSDO MUX" string="PFIL"
ctl name="AIN Mic Bias MUX" string="Mic Bias"
ctl name="ADC SW" string="On"

```

/path

[Stop Sequece]

path="off"

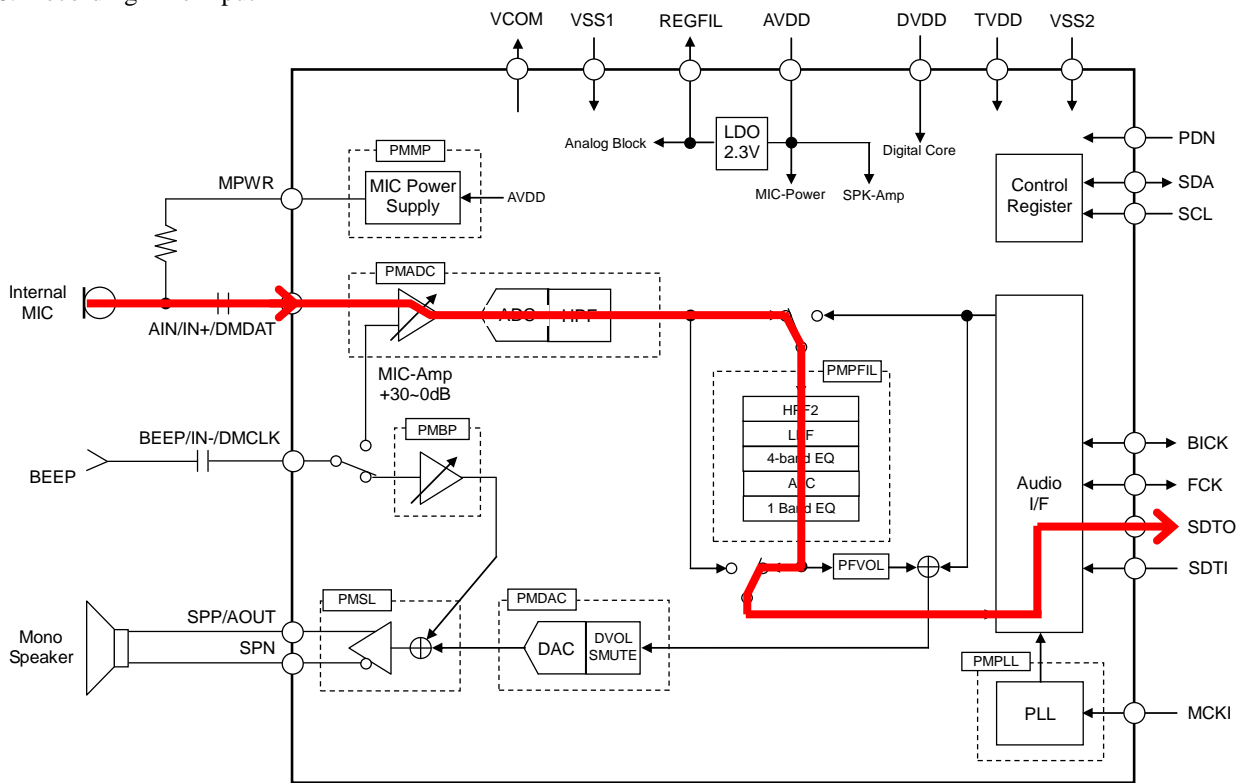
```

ctl name="Mic Gain Control" val="0"
ctl name="ADC SW" string="Off"
ctl name="AIN MUX" string="Single"
ctl name="AIN Mic Bias MUX" string="AIN"

```

/path

8. Recording Line Input



[Start Sequece]

path="on"

ctl name="Mic Gain Control" val="0"

ctl name="MIC MUX" string="AMIC"

ctl name="AIN MUX" string="Single"

ctl name="PFIL MUX" string="ADC"

ctl name="PFSDO MUX" string="PFIL"

ctl name="ADC SW" string="On"

/path

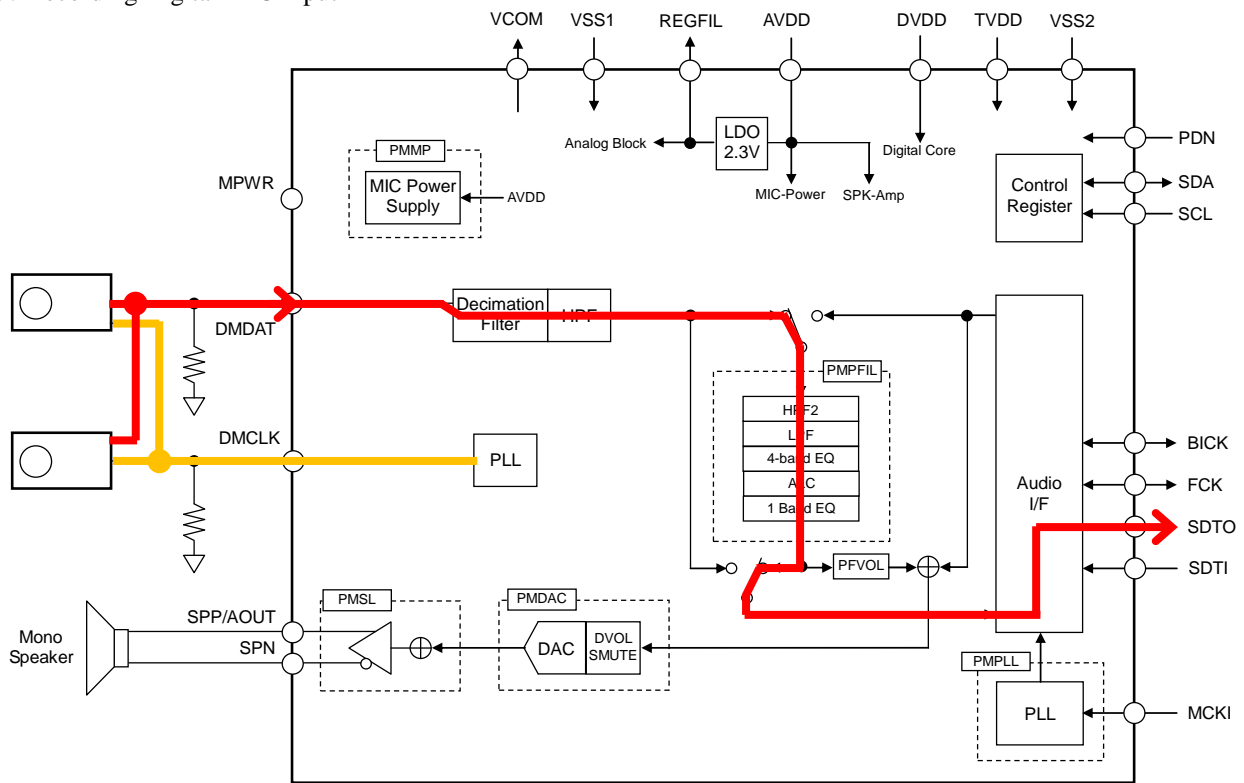
[Stop Sequece]

path="off"

ctl name="ADC SW" string="Off"

/path

9. Recording Digital MIC Input



[Start Sequece]

```

path="on"
  ctl name="MIC MUX" string="DMIC"
  ctl name="PFIL MUX" string="ADC"
  ctl name="PFSDO MUX" string="PFIL"
  ctl name="DMIC SW" string="On"
/path

```

[Stop Sequece]

```

path="off"
  ctl name="DMIC SW" string="Off"
  ctl name="MIC MUX" string="AMIC"
/path

```

REVISION HISTORY

Date (YY/MM/DD)	Revision	Reason	Page	Contents
15/07/02	1.0	First Edition		Kernel Version 3.0.31
16/09/26	2.0			Kernel Version 3.18.25
18/03/13	2.1		4	AK4637@12{ → ak4637@12{
19/05/24	2.2		1	Add Kernel 4.4.XX and 4.9.XX
			3	"#define AK4637_PDN_GPIO" is removed.

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