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**AK4136**  
**384kHz 32bit SRC**

## 1. General Description

The AK4136 is a 2ch digital sample rate converter (SRC). The input sample rate ranges from 8kHz to 384kHz. The output sample rate is from 8kHz to 384kHz. The AK4136 has an internal Oscillator. Therefore it does not need any external master clocks and simplifies a system configuration. The AK4136 is suitable for the application interfacing to different sample rates such as Automotive Audio Systems.

## 2. Features

- **2 channels input/output**
- **Asynchronous Sample Rate Converter**
- **PCM**
  - **Input Sample Rate Range(FSI): 8kHz~384kHz**
  - **Output Sample Rate Range(FSO): 8kHz~384kHz**
- **Input to Output Sample Rate Ratio: FSO/FSI = 1/6 ~ 12**
- **THD+N: Up to -130dB**
- **Dynamic Range: 140dB (A-weighted)**
- **I/F format: MSB justified, LSB justified, I<sup>2</sup>S compatible and TDM**
- **Oscillator for Internal Operation Clock**
- **Clock for Master mode: 128/192/256/384/512/768fso**
- **On-chip X'tal oscillator**
- **Digital De-emphasis Filter (32KHz, 44.1KHz, 48KHz)**
- **Soft Mute Function**
- **SRC Bypass mode (Master/Slave, PCM)**
- **uP Interface: I2C bus/SPI 4wires**
- **Power Supply**
  - **DVDD: 3.0~3.6V**
  - **DVDD: 1.7~1.9V (LDO OFF mode)**
- **Operating Temperature: Ta= -40 ~ +105°C**
- **Package**
  - **AK4136: 48-pin LQFP (0.5mm pitch)**



**3. Block Diagram**

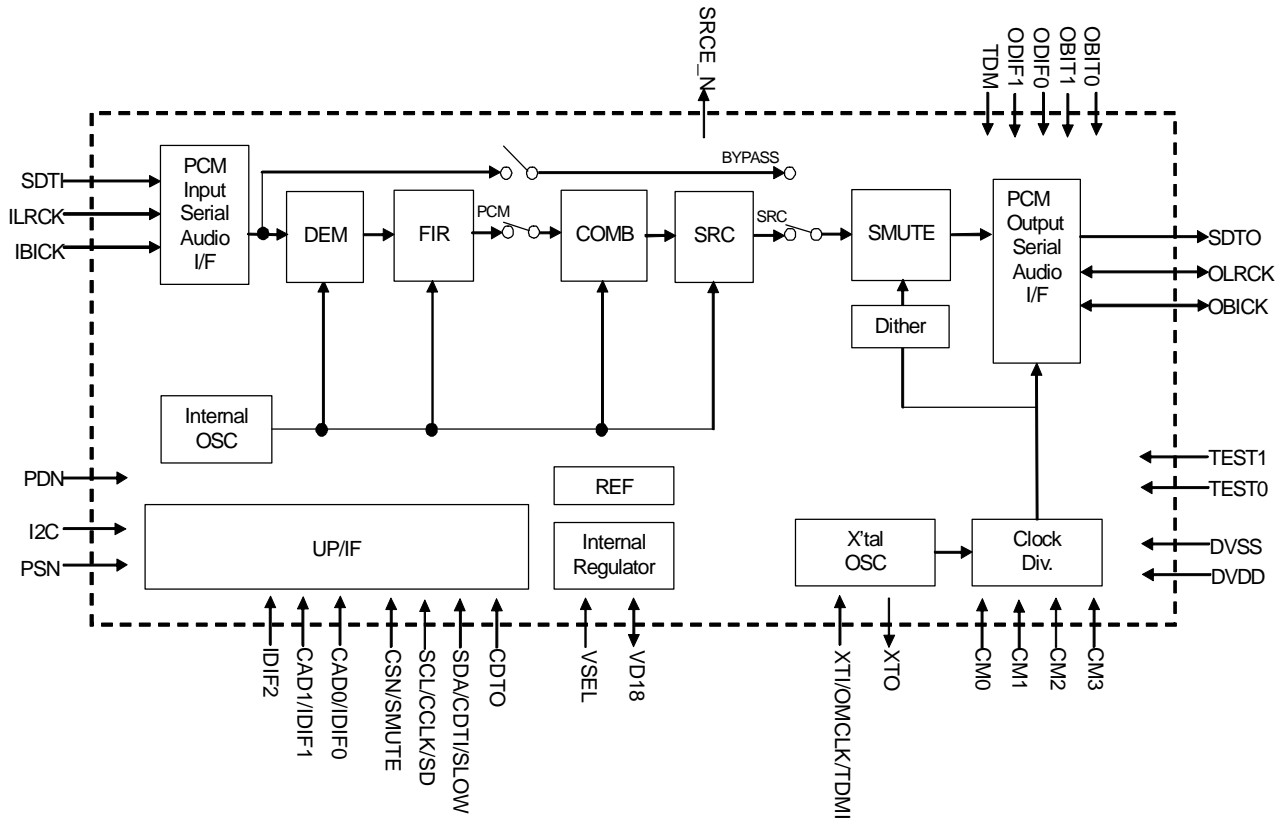


Figure 1. Block Diagram

#### 4. Absolute Maximum Ratings

(DVSS=0V; Note 1)

Parameter		Symbol	Min.	Max.	Unit
Power Supplies	Digital	DVDD	-0.3	4.3	V
	(Internal Digital) (Note 2)	DV18	-0.3	2.5	V
Input Current, Any Pin Except Supplies		IIN	-	±10	mA
Digital Input Voltage (Note 3)		VDIN	-0.3	DVDD+0.3	V
Ambient Temperature (Power applied) (Note 4)		Ta	-40	105	°C
Storage Temperature		Tstg	-65	150	°C

Note 1. All voltages are with respect to ground.

Note 2. DVSS must be connected to the same ground.

Note 3. DEM1-0, ILRCK/DSDIL, IBICK/DCLK, SDTI/DSDIR, IDIF0/CAD0, IDIF1/CAD1, IDIF2, PDN, PSN, I2C, SLOW/CDTI/SDA, SD/CCLK/SCL, SMUTE/SCN, SMSEMI, SMT1-0, OBIT1-0, ODIF1-0, CM3-0, DITHER, VSEL and TEST1-0 pins

Note 4. In the case that the PCB wiring density is more than 100%

WARNING: Operation at or beyond these limits may result in permanent damage to the device.  
Normal operation is not guaranteed at these extremes.

#### 5. Recommended Operation Conditions

(DVSS=0V; Note 1; VSEL= "L")

Parameter		Symbol	Min.	Typ.	Max.	Unit
Power Supplies	Digital	DVDD	3.0	3.3	3.6	V

(DVSS=0V; Note 1; VSEL= "H")

Parameter		Symbol	Min.	Typ.	Max.	Unit
Power Supplies (Note 5)	Digital	DVDD	1.7	1.8	1.9	V
	Digital	DV18	1.7	1.8	1.9	V
	Difference	DVDD- DV18		0		V

Note 1. All voltages are with respect to ground.

Note 5. DVDD and DV18 should be connected externally.

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