

## XS9933A: 4-Channel HD/SD Analog Video Decoder

XS9933A is a 4-channel analog composite video decoding chip that supports both HDcctv and CVBS protocols up to 4K@15fps. XS9933A converts the received high-definition analog composite video signal through analog-to-digital conversion, video decoding, and 2D image processing into YUV format, which is then transmitted to the master chip via the BT1120 or BT656 interface, enabling real-time preview and recording.

XS9933A supports down-stream audio data transmission over coaxial cable from remote camera. It also supports bidirectional data communication with camera for remote camera control and firmware upgrades. By integrating video, audio, and control data transmission into a single cable, it simplifies wiring requirements and enhances the ease of installation and debugging.

XS9933A features an embedded audio codec with 5-channel Line-In and 1-channel Line-Out interfaces, enabling 5-channel analog audio capture and 1-channel analog audio output. This facilitates voice recording and intercom applications, simplifying product design.

### Features

<b>VI</b>	<ul style="list-style-type: none"> <li>● 4-channel analog composite video decoding</li> <li>● Support 1M/2M/3M/4M/5M RT, 6M/8M NRT video format and CVBS format</li> <li>● Support multi-ch analog video format</li> <li>● Support manually extended video format</li> <li>● Embedded Equalizer (EQ) amplifier for best extended reach performance</li> <li>● High speed 10-bit Analog-to-Digital (ADC) for video signal sampling</li> <li>● Programmable clamp control</li> </ul>
<b>Video Decoder</b>	<ul style="list-style-type: none"> <li>● Enhanced automatic format recognition for video signal identification</li> <li>● Support AGC, ACC, White Peak</li> <li>● Brightness, Saturation, Contrast, Hue, and Sharpness adjustment</li> <li>● Advanced sync processor for best signal performance</li> <li>● Automatic frequency deviation compensation to accurate color demodulation</li> <li>● Integrated programmable high quality filter for Y/C separation</li> </ul>
<b>Audio</b>	<ul style="list-style-type: none"> <li>● 5-channel analog audio Line-In with PGA and digital processing</li> <li>● 1-channel analog audio Line-Out with gain control</li> <li>● Support 8 or 16KHz sampling rate with a max resolution of 16-bit</li> <li>● Support bidirectional coaxial audio over video for voice intercom with remote cameras</li> <li>● Cascade-able up to 4 chips</li> <li>● Support 1-channel I2S for audio record and 1-channel I2S for audio playback</li> <li>● I2S support multiple channel output</li> </ul>

## Features

<b>VO</b>	<ul style="list-style-type: none"> <li>● ITU-R BT.656/BT.1120 YUV422 output with embedded sync</li> <li>● Support flexible 2-channel multiplexed output on any BT bus</li> <li>● Support 4-channel multiplexed output on any BT bus</li> <li>● Support Y/UV swap on BT.1120 bus</li> <li>● Support programmable channel ID in multiplexed output</li> <li>● Support programmable clock delay characteristics for different chip interconnection requirements</li> <li>● Support single edge data output (SEDO) and double edge data output (DEDO)</li> </ul>
<b>Bidirectional Communication</b>	<ul style="list-style-type: none"> <li>● Programmable up-stream data sending over cable</li> <li>● Programmable down-stream data decoding</li> <li>● Support firmware upgrades for remote cameras</li> </ul>

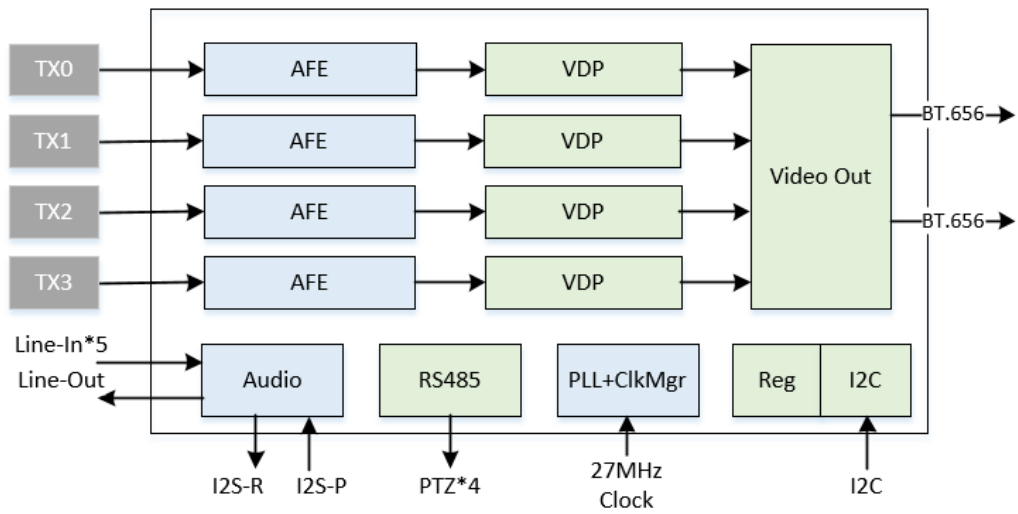
## Peripherals

<b>Video Interfaces</b>	VI	● 4-channel analog video input
	VO	● 2-channel BT.656 or 1-channel BT.1120
<b>Audio Interfaces</b>	Line-In	● 5-channel
	Line-Out	● 1-channel
	Cascade	● 1-channel
	I2S	<ul style="list-style-type: none"> <li>● 1-channel for audio record</li> <li>● 1-channel for audio playback</li> </ul>
<b>PTZ</b>		● 4-channel
<b>Other Interfaces</b>		● Interrupt interface for video loss
		● I2C
		● 27MHz crystal or clock input

## Physical Specs

<b>Operating Voltage</b>	<ul style="list-style-type: none"> <li>● 1.1V core voltage</li> <li>● 3.3V I/O voltage</li> <li>● 1.8V/3.3V HS I/O voltage</li> <li>● 3.3V and 1.1V analog voltage</li> </ul>
<b>Package</b>	● 10 mm × 10 mm QFN88

## Block Diagram



## Application Solution

