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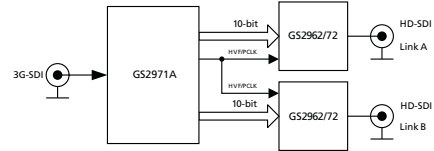
# GS2971A 3Gb/s, HD, SD SDI Receiver, with Integrated Adaptive Cable Equalizer complete with SMPTE Audio and Video Processing

## Key Features

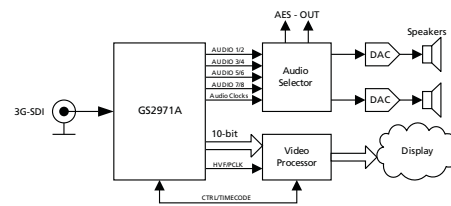
- Operation at 2.97Gb/s, 2.97/1.001Gb/s, 1.485Gb/s, 1.485/1.001Gb/s and 270Mb/s
- Supports SMPTE 425M (Level A and Level B), SMPTE 424M, SMPTE 292M, SMPTE 259M-C and DVB-ASI
- Integrated adaptive cable equalizer
- Typical equalized length of Belden 1694A cable:
  - ♦ 150m at 2.97Gb/s
  - ♦ 250m at 1.485Gb/s
  - ♦ 480m at 270Mb/s
- Integrated Reclocker with low phase noise, integrated VCO
- Serial digital reclocked, or non-reclocked output
- Integrated audio de-embedder for 8 channels of 48kHz audio
- Integrated audio clock generator
- Ancillary data extraction
- Optional conversion from SMPTE 425M Level B to Level A for 1080p 50/60 4:2:2 10-bit
- Parallel data bus selectable as either 20-bit or 10-bit
- Comprehensive error detection and correction features
- Output H, V, F or CEA 861 Timing Signals
- 1.2V digital core power supply, 1.2V and 3.3V analog power supplies, and selectable 1.8V or 3.3V I/O power supply
- GSPI Host Interface
- Wide temperature range of -40°C to +85°C
- Low power operation (typically 545mW)
- Small 11mm x 11mm 100-ball BGA package
- Pb-free and RoHS compliant

## Applications

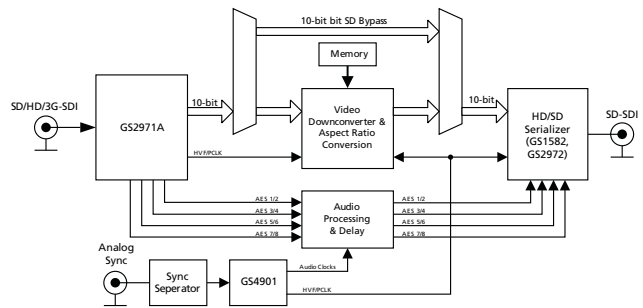
Application: Single Link (3G-SDI) to Dual Link (HD-SDI) Converter



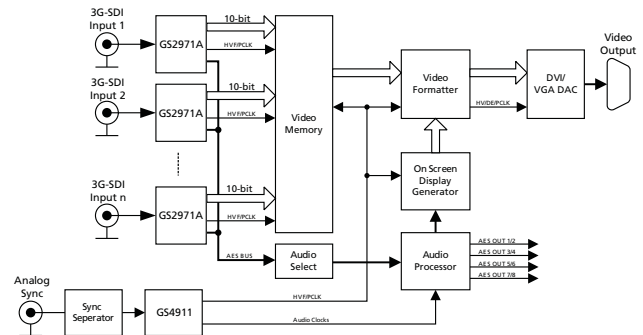
Application: 1080p50/60 Monitor



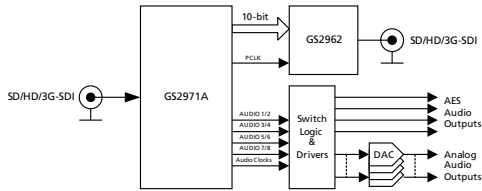
Application: Multi-format Downconverter



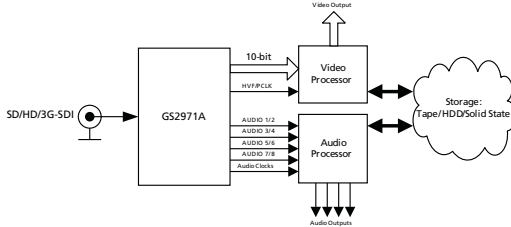
Application: Multi-input Video Monitoring System



Application: Multi-format Audio De-embedder Module



Application: Multi-format Digital VTR/Video Server



## Description

The GS2971A is a multi-rate SDI integrated Receiver which includes complete SMPTE processing, as per SMPTE 425M, 292M and SMPTE 259M-C. The SMPTE processing features can be bypassed to support signals with other coding schemes.

The GS2971A integrates Gennum's adaptive cable equalizer technology, achieving unprecedented cable lengths and jitter tolerance. It features DC restoration to compensate for the DC content of SMPTE pathological signals.

The device features an Integrated Reclocker with an internal VCO and a wide Input Jitter Tolerance (IJT) of 0.7UI.

A serial digital loop through output is provided, which can be configured to output either reclocked or non-reclocked serial digital data. The serial digital output can be connected to an external cable driver.

The device operates in one of four basic modes: SMPTE mode, DVB-ASI mode, Data-Through mode or Standby mode.

In SMPTE mode (the default operating mode), the GS2971A performs full SMPTE processing, and features a number of data integrity checks and measurement capabilities.

The device also supports ancillary data extraction, and can provide entire ancillary data packets through host-accessible registers. It also provides a variety of other packet detection and error handling features. All of these processing features are optional, and may be individually enabled or disabled through register programming.

Both SMPTE 425M Level A and Level B inputs are supported with optional conversion from Level B to Level A for 1080p 50/59.94/60 4:2:2 10-bit inputs.

In DVB-ASI mode, sync word detection, alignment and 8b/10b decoding is applied to the received data stream.

In Data-Through mode, all forms of SMPTE and DVB-ASI decoding are disabled, and the device can be used as a simple serial to parallel converter.

The device can also operate in a lower power Standby mode. In this mode, no signal processing is carried out and the parallel output is held static.

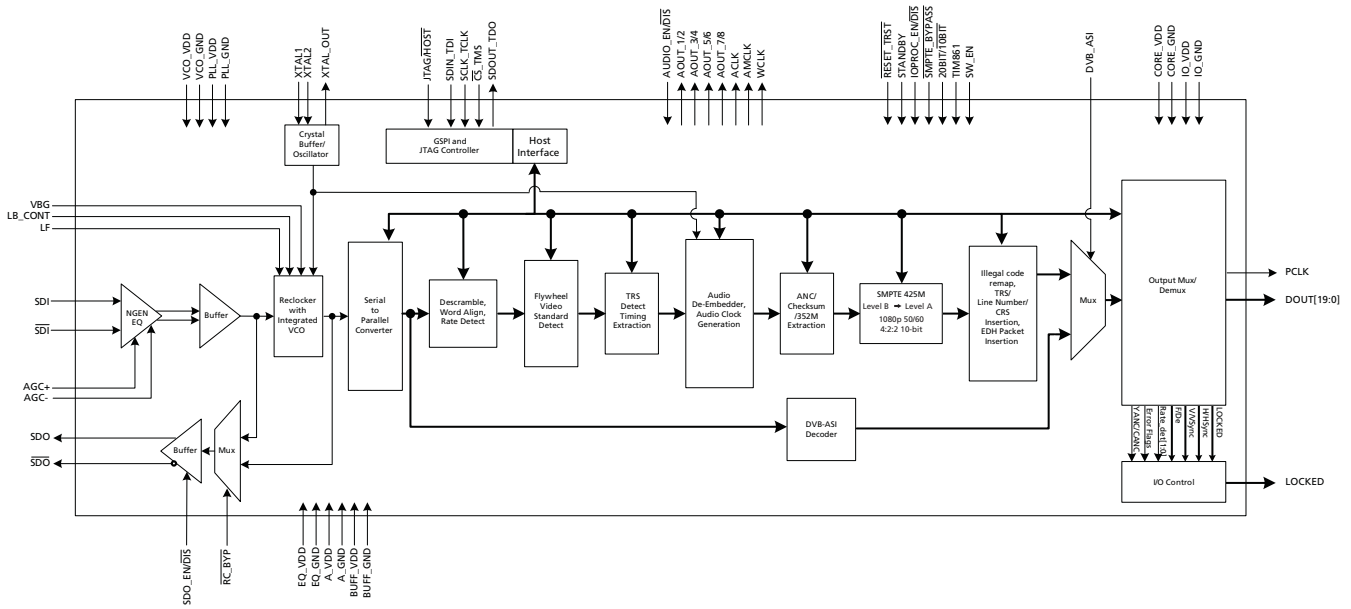
Parallel data outputs are provided in 20-bit or 10-bit format for 3Gb/s, HD and SD video rates, with a variety of mapping options. As such, this parallel bus can interface directly with video processor ICs, and output data can be multiplexed onto 10 bits for a low pin count interface.

Up to eight channels (two audio groups) of serial digital audio may be extracted from the video data stream, in accordance with SMPTE 272M-C and SMPTE 299M.

The output audio formats supported by the device include AES/EBU and I<sup>2</sup>C, and two other industry standard serial digital formats. A variety of audio processing features are provided to ease implementation. Audio clocks are internally generated and provided by the device.



# Functional Block Diagram



GS2971A Functional Block Diagram

## Pin Out

	1	2	3	4	5	6	7	8	9	10
A	VBG	LF	LB_CONT	VCO_VDD	STAT0	STAT1	IO_VDD	PCLK	DOUT18	DOUT17
B	A_VDD	PLL_VDD	RSV	VCO_GND	STAT2	STAT3	IO_GND	DOUT19	DOUT16	DOUT15
C	SDI	A_GND	PLL_VDD	PLL_VDD	STAT4	STAT5	RESET_TRST	DOUT12	DOUT14	DOUT13
D	SDI	A_GND	A_GND	PLL_GND	CORE_GND	CORE_VDD	SW_EN	JTAG/HOST	IO_GND	IO_VDD
E	EQ_VDD	EQ_GND	A_GND	PLL_GND	CORE_GND	CORE_VDD	SDOUT_TDO	SDIN_TDI	DOUT10	DOUT11
F	AGC+	RSV	A_GND	PLL_GND	CORE_GND	CORE_VDD	CS_TMS	SCLK_TCK	DOUT8	DOUT9
G	AGC-	A_GND	RC_BYP	CORE_GND	CORE_GND	CORE_VDD	SMPTC_BYPASS	DVB_ASI	IO_GND	IO_VDD
H	BUFF_VDD	BUFF_GND	AUDIO_EN/DIS	WCLK	TIM_861	XTAL_OUT	20bit/10bit	IOPROC_EN/DIS	DOUT6	DOUT7
J	SDO	SDO_EN/DIS	AOUT_1/2	ACLK	AOUT_5/6	XTAL2	IO_GND	DOUT1	DOUT4	DOUT5
K	SDO	STANDBY	AOUT_3/4	AMCLK	AOUT_7/8	XTAL1	IO_VDD	DOUT0	DOUT2	DOUT3

GS2971A Pin Out

The following table shows the pin difference between the GS2970A and the GS2971A:

Pin Number	GS2970A	GS2971A	Functional Description of the GS2971A Pins
E1	SDI_VDD	EQ_VDD	POWER pin for the EQ.
E2	SDI_GND	EQ_GND	GND pin for the EQ.
F1	TERM	AGC+	Attach the AGC capacitor between this pin and AGC-.
G1	RSV	AGC-	Attach the AGC capacitor between this pin and AGC+.
G2	RSV	A_GND	Analog GND pin.
G4	RSV	CORE_GND	GND connection – digital logic.

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**DOCUMENT IDENTIFICATION**  
**PRODUCT BRIEF**

The product is in a development phase and specifications are subject to change without notice. Gennum reserves the right to remove the product at any time. Listing the product does not constitute an offer for sale.

**CAUTION**

ELECTROSTATIC SENSITIVE DEVICES  
DO NOT OPEN PACKAGES OR HANDLE EXCEPT AT A  
STATIC-FREE WORKSTATION



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