



video



Enabling the Future of Video Transport

Broadcast Video Selector Guide

- Equalizers - now with longer reach
- Cable Drivers - advanced new features
- Reclockers
- Configurable SDI I/O
- Serializers
- Deserializers
- Crosspoint Switches
- Timing (Gen-Clocks)

End-To-End Portfolio of Broadcast Video Solutions



Enabling the Future of Video Transport

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As a pioneer in digital video, Semtech - Gennum Products continues to lead the way in proven SD, HD and 3Gb/s and emerging 6G UHD-SDI technologies. We offer the world's most advanced solutions designed specifically for real world broadcast challenges, including the latest innovations designed to help push the boundaries of performance, reach and signal integrity, while reducing time to market and design risks.

In fact, there's a good chance that any TV broadcast or professional video passed through several Semtech components.

20 years of technology and standards leadership

For 20 plus years Semtech (previously Gennum) has focused on bringing innovative performance solutions to the professional and broadcast video market and has been a leader in broadcast video standardization activities. This history of innovation and achievement is a result of a company wide focus and commitment to the broadcast industry sparking many industry first products with unparalleled performance and reliability.

With this ongoing focus on the broadcast industry and as a key contributor to SMPTE, Semtech continues to pioneer transport technologies that deliver new experiences for the video broadcast market.



Comprehensive portfolio of industry leading SDI products, SD, HD, 3G and beyond...

We offer the most comprehensive, end-to-end portfolio of broadcast video solutions available, including our new family of long-reach and high-density adaptive equalizers, next generation cable drivers and the industry's most feature-rich crosspoint switches.

6G UHD-SDI Solutions

As next generation broadcast television and D-Cinema applications; such as stereoscopic 3DTV and 3D D-Cinema; UHDTV-1, 4K D-Cinema and UHDTV-2 production high frame rate (HFR) and high dynamic range (HDR) production, become more prolific in the marketplace, new, high speed SDI solutions are becoming necessary. 6G UHD-SDI enabled equipment provides the most optimized solution for the transport of future high quality, multi-media content. For more information on 6G UHD-SDI, please contact your Semtech representative.

Dedicated to customer success

Our commitment to customer success is evident in everything we do. That's why we:

- Comprehensively test each component in production, assuring high yield on assembled boards.
- Offer complimentary design review and feedback on Semtech-based designs to shorten design cycles, reduce risks and optimize performance.
- Provide dedicated field and applications engineering support throughout the product's life-cycle.

And this commitment to the broadcast market is demonstrated by our ongoing contributions to and investments in SD, HD & 3Gb/s standardization and technologies. We ease the migration path for customers to get to market quickly with differentiated solutions that are future-proofed for next generation video formats, ever-increasing data rates, and evolving I/O and distance requirements.



Equalizers

Industry's most pervasive SDI equalizers— longest cable lengths, lowest jitter and data rates up to 3Gb/s



PERFORMANCE OPTIMIZED

Semtech offers a comprehensive range of 3Gb/s adaptive cable equalizers optimized for real-world applications. The GS3440 long-reach 3Gb/s adaptive cable equalizer is optimized for robust performance in applications requiring 200 meters of 3Gb/s cable reach. For greater flexibility, the GS3441, a dual output version of the GS3440, is also available.

LONG CABLE REACH - PRODUCTION TESTED

Designed for applications requiring maximum cable reach and robust performance, the GS3440 and GS3441 feature the industry's longest reach, 200m at 3Gb/s. Semtech equalizers are production tested at applicable data rates and cable lengths ensuring the best performance and highest board yields.

MULTI-RATE

Semtech equalizers offer robust multi-standard operation from 125Mb/s to 2970Mb/s even in the presence of stressful video pathological signals and are fully SMPTE 424M, 292M, 344M and 259M compliant.

LOWEST JITTER

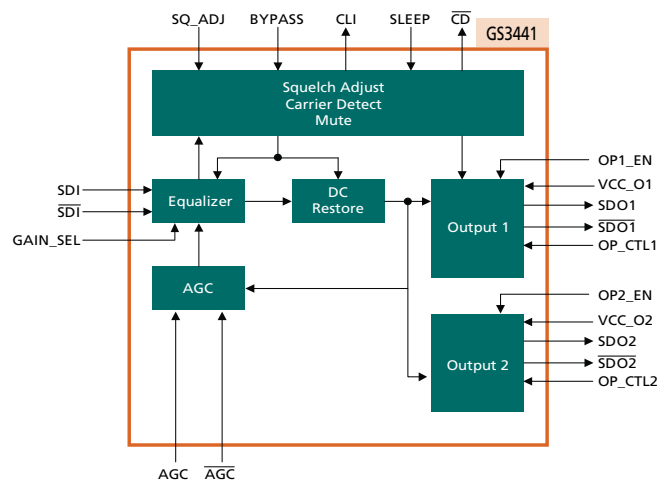
Semtech continues to reduce jitter at all cable lengths and for all data rates. The GS3440 and GS3441 offer the industry's longest cable reach with robust performance.

LOW POWER

Semtech equalizers feature low power consumption for power sensitive applications.

IMPROVED FEATURES

Enhanced ESD performance is critical for terminal I/O connectivity and will result in more robust and higher manufacturing yields.



CABLE EQUALIZERS												
	Data Rate (Mb/s)	Input 0/6dB gain	Output Coupling	No. of Outputs	3G Cable Length (m)	HD Cable Length (m)	SD Cable Length (m)	Footprint Compat. with	Temp Range (°C)	Power (mW)	Size (mm)	Pkg
GS3440	125 - 2970	YES	1.2 - 3.3V	1	210	300	550	all 16 QFN EQs	-40 to +85	180	4x4	16 QFN
GS3441	125 - 2970	YES	1.2 - 3.3V	2	210	300	550	GS2993	-40 to +85	212	4x4	24 QFN
GS2993	143 - 2970	YES	1.2 - 3.3V	2	140	200	400	GS3441	-40 to +85	165	4x4	24 QFN
GS2994	143 - 2970	YES	1.2 - 3.3V	1	140	200	400	all 16 QFN EQs	-40 to +85	165	4x4	16 QFN
GS2984	143 - 2970	YES	2.5/3.3V	1	140	200	400		-40 to +85	195	4x4	16 QFN
GS2964	143 - 2970	NO	3.3V	1	100	130	170		-40 to +85	215	4x4	16 QFN
GS1674	143 - 1485	NO	3.3V	1	N/A	220	400		-40 to +85	195	4x4	16 QFN
GS9074A	143 - 360	NO	3.3V	1	N/A	N/A	350		0 to +70	215	4x4	16 QFN

Cable Drivers

Lowest jitter, best ORL, and data rates up to 3Gb/s



MULTI-RATES

Semtech cable drivers offer robust multi-standard operation from 143Mb/s to 2970Mb/s and are SMPTE 424M, 292M, 344M and 259M compliant.

LOW POWER

Semtech offers the best performance at the lowest power consumption with an additional 45% power reduction in standby mode.

LOW JITTER

Ultra low additive jitter at SD, HD, and 3Gb/s data rates.

BEST ORL

Better than -20dB output return loss (ORL) for HD applications and better than -12dB ORL for 3Gb/s applications.

INPUT TRACE EQUALIZATION

The GS2988 and GS2989 have trace equalization to equalize long input trace lengths.

LARGER OUTPUT SWING

The GS2988 and 2989 offer higher maximum output swing to compensate for losses that occur after the cable driver output. A larger output swing enables passive mux solutions (for creating larger systems).

UP TO FOUR OUTPUTS

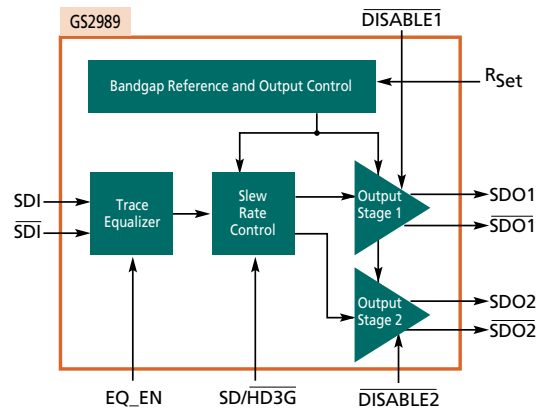
The GS2989 offers four outputs for distribution applications.

OUTPUT SIGNAL PRESENCE

The GS2988 and GS2989 offer an output signal presence detector which provides status on the validity of the output.

APPLICATIONS

Routers, distribution amplifiers, camera control units, multiviewers, production switchers, master control switchers, VTRs, video servers, encoders/decoders, up/down/cross converters, test and measurement equipment. Compatible with both standard BNC and newer, alternative connectors such as the HD-BNC and DIN 1.0/2.3.



CABLE DRIVERS													
Part Number	Data Rate (Mb/s)	Power (mW)	Power Supply (V)	Outputs	Outputs Cable Boost™ (db)	Input Trace EQ	Output Signal Presence	Max Output Swing (mV)	ESD Prot. (kV)	ORL (dB)	Circuit Compatible with	Temp Range (°C)	Pkg
GS2988	143 - 2970	110	2.5 or 3.3	2	-	YES	YES	1800	2.5	3G: -15 HD: -19	GS1678, GS9077	-40 to +85	16 QFN
GS2989		180		4	-	YES	YES	1800	2.5	3G: -15 HD: -19	GS1679		
GS3480	0.1 to 2970	146		2	9 (1db steps)	YES	YES	2400	2	3G: -14 HD: -18	-		24 QFN
GS3481		146		4	-	YES	YES	2400	2	3G: -14 HD: -18	-		
GS1678	143 - 1485	110		2	-	NO	YES	1200	2.5	-19	GS2988, GS9077		16 QFN
GS1679	-	180		4	-	NO	YES	1200	2.5	-19	GS2989		
GS9077	143 - 540	168		3.3	2	-	NO	NO	1040	4	-20		GS1678, GS2988

Reclockers

Industry's lowest power and lowest jitter 3Gb/s solutions



IMPROVED JITTER TOLERANCE

As routers and distribution systems grow in size, system jitter increases. Reclocking has become important in maintaining overall system robustness. In addition, as processing is being integrated into more and more devices, reducing the overall jitter in a system is critical, given that many processing specific devices like FPGAs can have poor IJT. Performance leading reclockers such as the Semtech GS2985 can be utilized to increase overall system margin.

MULTI-RATE

Semtech reclockers offer robust multi-standard operation from 270Mb/s to 2970Mb/s and are SMPTE 424M, 292M and 259M-C compliant.

LOWEST POWER

Semtech offers high-performance at the industry's lowest power consumption.

BEST INPUT JITTER TOLERANCE

Semtech's unique reclocker architecture offers the industry's best input jitter tolerance for worry-free design flexibility. The GS2965, GS2985 and GS2986 all have a minimum input jitter tolerance of 0.8UI, making them ideal for 3Gb/s SDI designs.

LOW OUTPUT JITTER

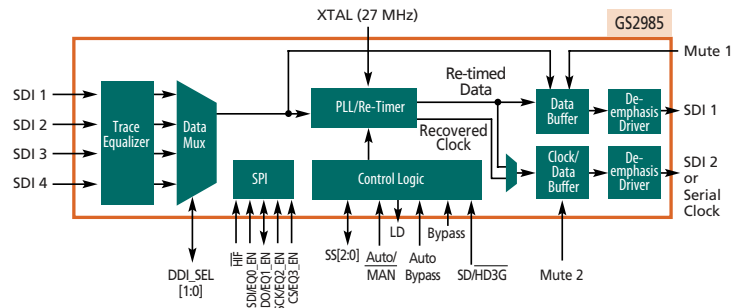
The GS2985 features robust performance with the industry's best output jitter.

ADDITIONAL FEATURES

The GS2965, GS2985, and GS2986 add input trace equalization and output signal de-emphasis, which provides additional flexibility to system designers. In addition, the serial control interface to these devices provide multiple communication methods. These devices also feature automatic slew rate control when used with Semtech's cable drivers for multiformat applications. The integrated 2:1 or 4:1 signal selection mux at the input of the Semtech reclockers allows them to be utilized in architectures that require switching matrices and failover redundancy. This reduces the need for additional signal path components and their associated jitter.

SIZE

The GS2985 maintains the same size as previous generations, while the GS2986 maintains the same features as the GS2985 but is 55% smaller. The GS2965 is 69% smaller than the GS2985.



RECLOCKS												
Part Number	Data Rate (Mb/s)	Power Supply (V)	Output Jitter (UI)	Input Trace EQ	Output De-emphasis	Serial Interface	Input MUX	Dual Data Output	Temp Range (°C)	Power (mW)	Size (mm)	Pkg
GS2965	270, 1485, 2970	2.5 or 3.3		YES	YES	YES	2 : 1	YES	-40 to +85	180	5x5	32 QFN
GS2985	270, 1485, 2970	2.5 or 3.3	3G: 0.05 HD: 0.03 SD: 0.01	YES	YES	YES	4 : 1	YES	-40 to +85	180	9x9	64 QFN
GS2986	270, 1485, 2970	2.5 or 3.3		YES	YES	YES	4 : 1	YES	-40 to +85	180	6x6	40 QFN
GS1675	270, 1485	2.5 or 3.3	HD: 0.03 SD: 0.01	YES	YES	YES	2 : 1	YES	-40 to +85	180	5x5	32 QFN
GS9076	270	3.3	SD: 0.02	NO	NO	NO	4 : 1	YES	0 to +70	400	9x9	64 QFN

Configurable SDI Input/Output - Equalizer/Cable Driver



Lowest jitter, best ORL, and data rates up to 3Gb/s

DESIGN FLEXIBILITY

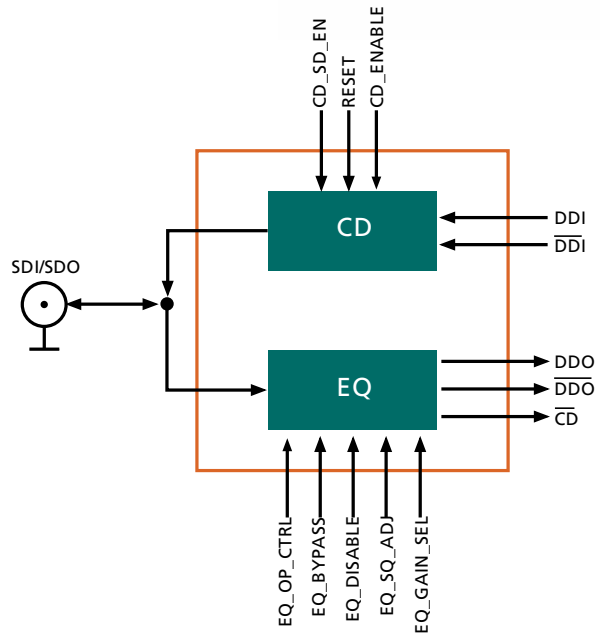
The GS3490 is ideal for high-density applications with limited connector space where individual connectors may need to be configured as either an input or output. In addition, the GS3490 is suitable for multi-function PCBs that require individual IO to be configured based on final product configuration.

BEST IN CLASS PERFORMANCE

Offering the longest cable reach for a configurable SDI I/O, the GS3490 is capable of 140m at 2.97Gb/s, 250m at 1.485Gb/s and 550m at 270Mb/s (SD and DVB/ASI). External termination components allow for flexibility of layout and tuning for PCB layout optimization.

SMALL PACKAGE SIZE

The GS3490 features a manufacturing friendly 5x5 QFN package which is ideal for applications with a dense channel pitch and limited PCB space.



CONFIGURABLE SDI INPUT/OUTPUT - EQUALIZER/CABLE DRIVER								
Part Number	Data Rate (Mb/s)	Power (mW)	Outputs	Cable Reach (m)	DVB-ASI	Temp (°C)	Size (mm)	Pkg
GS3490	125-2970	EQ: 202 CD: 215	EQ: 1 CD: 1	3G: 140 HD: 250 SD: 550	Yes	-40-85	5x5	32 QFN

Product Guide

EQUALIZERS

Part Number	Data Rate (Mb/s)	Power (mW)	3G Cable Lgth (m)	HD Cable Lgth (m)	SD Cable Lgth (m)	Input 0/6dB gain	No. of Outputs	Output Coupling	Cable Lgth Indication	Temp Range (°C)	Pkg
GS3440	125 - 2970	180	210	300	550	YES	1	1.2 - 3.3V	NO	-40 to +85	16 QFN
GS3441	125 - 2970	212	210	300	550	YES	2	1.2 - 3.3V	YES	-40 to +85	24 QFN
GS2993	143 - 2970	165	140	200	400	YES	2	1.2 - 3.3V	YES	-40 to +85	24 QFN
GS2994	143 - 2970	165	140	200	400	YES	1	1.2 - 3.3V	NO	-40 to +85	16 QFN
GS2984	143 - 2970	195	140	200	400	YES	1	2.5/3.3V	NO	-40 to +85	16 QFN
GS2964	143 - 2970	215	100	130	170	NO	1	3.3V	NO	-40 to +85	16 QFN
GS1674	143 - 1485	195	N/A	220	400	NO	1	3.3V	NO	-40 to +85	16 QFN
GS9074A	143 - 360	215	N/A	N/A	350	NO	1	3.3V	NO	0 to +70	16 QFN

CABLE DRIVERS

Part Number	Data Rate (Mb/s)	Power (mW)	Power Supply (V)	Outputs	Input Trace EQ	Output Signal Presence	Max Output Swing (mV)	Temp Range (°C)	Pkg
GS2988	143 - 2970	110	2.5 or 3.3	2	YES	YES	1800	-40 to +85	16 QFN
GS2989	143 - 2970	180	2.5 or 3.3	4	YES	YES	1800	-40 to +85	16 QFN
GS3480	0.1 to 2970	146	2.5 or 3.3	2	YES	YES	2400	-40 to +85	24 QFN
GS3481	0.1 to 2970	146	2.5 or 3.3	4	YES	YES	2400	-40 to +85	24 QFN
GS1678	143 - 1485	110	2.5 or 3.3	2	NO	YES	1200	-40 to +85	16 QFN
GS1679	143 - 1485	180	2.5 or 3.3	4	NO	YES	1200	-40 to +85	16 QFN
GS9077	143 - 540	168	3.3	2	NO	NO	1040	0 to +70	16 QFN

RELOCKERS

Part Number	Data Rate (Mb/s)	Power (mW)	Power Supply (V)	Input Trace EQ	Output De-emphasis	Input MUX	Temp Range (°C)	Size (mm)	Pkg
GS2965	270, 1485, 2970	180	2.5 or 3.3	YES	YES	2 : 1	-40 to +85	5x5	32 QFN
GS2985	270, 1485, 2970	180	2.5 or 3.3	YES	YES	4 : 1	-40 to +85	9x9	64 QFN
GS2986	270, 1485, 2970	180	2.5 or 3.3	YES	YES	4 : 1	-40 to +85	6x6	40 QFN
GS1675	270, 1485	180	2.5 or 3.3	YES	YES	2 : 1	-40 to +85	5x5	32 QFN
GS9076	270	400	3.3	NO	NO	4 : 1	0 to +70	9x9	64 QFN

CONFIGURABLE SDI INPUT/OUTPUT - EQUALIZER/CABLE DRIVER

Part Number	Data Rate (Mb/s)	Power (mW)	Outputs	Cable Reach (m)	DVB-ASI	Temp (°C)	Size (mm)	Pkg
GS3490	125-2970	EQ: 202 CD: 215	EQ: 1 CD: 1	3G: 140 HD: 250 SD: 550	Yes	-40-85	5x5	32 QFN

SERIALIZERS

Part Number	Data Rate (Mb/s)	Video Processing	Audio Embed	Output Jitter (ps)	Parallel Bus Width	CEA 861 Timing	Temp Range (°C)	Power (mW)	Pkg
GS2972	270, 1485, 2970	YES	YES	3G: 40 HD: 50 SD: 200	10 or 20	YES	-40 to +85	400	BGA 100
GS2962	270, 1485, 2970	YES	NO	3G: 40 HD: 50 SD: 200	10 or 20	YES	-40 to +85	350	BGA 100
GS1672	270, 1485	YES	YES	HD:50 SD: 200	10 or 20	YES	-40 to +85	350	BGA 100
GS1662	270, 1485	YES	NO	HD: 50 SD: 200	10 or 20	YES	-40 to +85	330	BGA 100
GS9092A	270	YES	NO	SD: 225	10	NO	0 to +70	200	QFN 56

DESERIALIZERS

Part Number	Data Rate (Mb/s)	Equalizer	Video Processing	Serial Loop Through	IJT (UI)	ANC Extraction	Audio De-embed	CEA 861 Timing	Temp Range (°C)	Power (mW)	Pkg
GS3419	270, 1485, 2970	YES	YES	YES	0.7	YES	YES	YES	-40 to +85	545	BGA 100
GS3418	270, 1485, 2970	YES	YES	YES	0.7	YES	NO	YES	-40 to +85	515	BGA 100
GS2970A	270, 1485, 2970	NO	YES	YES	0.7	YES	YES	YES	-40 to +85	350	BGA 100
GS2960A	270, 1485, 2970	NO	YES	YES	0.7	YES	NO	YES	-40 to +85	320	BGA 100
GS1661A ¹	270, 1485	YES	YES	YES	0.7	YES	NO	YES	-40 to +85	460	BGA 100
GS1660A ²	270, 1485	NO	YES	YES	0.7	YES	NO	NO	-40 to +85	280	BGA 100
GS9091B	270	YES	YES	NO	0.5	YES	NO	NO	0 to +70	350	BGA 100
GS9090B	270	NO	YES	NO	0.5	YES	NO	NO	0 to +70	145	QFN 56

1-GS1671A audio version available, 2-GS1670A audio version available.

CROSSPOINT SWITCHES

Part Number	Data Rate (Gb/s)	Power (W)	Inputs	Outputs	Input Trace EQ	Output De-emphasis	Pkg
GX3290	3.5	34	290	290	YES	YES	2377 BGA
GX3190	3.5	25	146	290	YES	YES	2377 BGA
GX3246	3.5	18	290	146	YES	YES	2377 BGA
GX3202	3.5	24	202	202	YES	YES	2377 BGA
GX3146	3.5	18	146	146	YES	YES	2377 BGA
GX4002	14	0.3	2	2	YES	YES	32 QFN

Choosing the Right SerDes For Your System

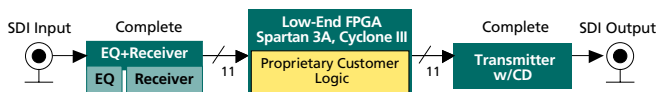
Serializers/Deserializers

Designers have the choice of selecting components from different vendors. But when it comes to designs with serializers and deserializers, they must first choose an architecture. In implementing a design with a serializer and/or deserializer, there are 3 architectural choices: Semtech's complete serializer/deserializer solution architecture, an integrated-transceiver FPGA architecture and an FPGA-helper architecture. Let's explore these three options with an assessment of the following key parameters: jitter, power consumption, integration (component/features), time-to-market, system size and cost.

SEMTECH'S COMPLETE SOLUTION ARCHITECTURE

Leveraging our expertise in signal integrity and our deep understanding of broadcast video technologies, Semtech's SDI serializer and deserializer offering encapsulates all the analog components (SerDes, VCO, CD, EQ, Reclocker) and digital SMPTE video and audio processing required to transmit and receive SDI video. Integrating all of these components into one package reduces the PCB footprint required to implement SDI transmit/receive, and the solution benefits from Semtech's superior jitter performance. This optimized, cost-effective and power efficient ASIC implementation allows customers to focus on their unique value-added processing for quicker time-to-market. Only Semtech offers a solution that scores high for each evaluation parameter.

Genum: Complete Solution Transmitter/Receiver

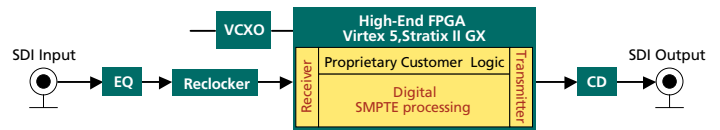


INTEGRATED-TRANSCIEVER FPGA ARCHITECTURE

Integrated-transceiver FPGAs typically offer the worst specifications in terms of jitter. Maximum output jitter and input jitter tolerance (IJT) are typically at the limit of the SMPTE standards, and, in some cases, actually in violation of industry norms. That is why extra components, namely VCXOs and reclockers, are required to get the system jitter performance to an acceptable level. This comes at a penalty of higher power consumption, system footprint size and cost. Because of all the fine tuning required to get this architecture to work, and because of the IP licensing/development required for the digital SMPTE video processing, this

architecture unnecessarily prolongs time-to-market. Finally, while FPGAs integrate transceivers, they do not integrate routing components like cable drivers and equalizers.

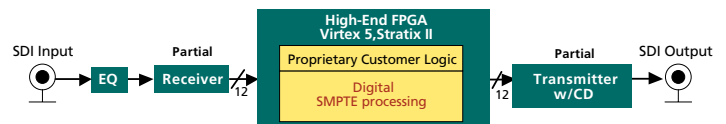
Integrated Transceiver FPGAs



FPGA-HELPER ARCHITECTURE

The FPGA-helper architecture, as depicted below, involves the use of a component that includes the physical media attachment part of a SMPTE deserializer/serializer, with the digital SMPTE processing implemented in the FPGA. The result is an architecture that is taxing in terms of power consumption and those FPGA-helper parts are lacking even basic SMPTE digital processing. In many cases, product specific FPGA IP already requires high utilization factors in small, low-cost FPGAs, and the added requirement of digital SMPTE video processing in the FPGA may drive adoption of a larger FPGA. This results in further penalties in power consumption, size and system cost. And while this architecture fares well in system jitter performance in certain cases, the added engineering effort in developing (or licensing) and stitching that video processing logic to product specific code ensures a slower time-to-market. Finally, while some FPGA-helper parts integrate a cable driver, the offering lacks an integrated equalizer.

FPGA-Helper SERDES



HOW THE SEMTECH SOLUTION STACKS UP

Compare the ratings of each of the 3 architectures for key parameters in an implementation of 1 Rx and 1 Tx channel.

	Semtech COMPLETE SOLUTION	INTEGRATED-TRANSCIEVER FPGA	FPGA-HELPER SERDES
Jitter Performance	■	■	■
Time-to-Market	■	■	■
Power Consumption	■	■	■
Integration	■	■	■
Overall PCB Space	■	■	■
System Cost	■	■	■

Serializers

The easiest, fastest, lowest power method of implementing an SDI or ASI link.



3Gb/s SDI

Semtech's GS2972 and GS2962 are fully compliant with SMPTE 424M and 425M including support for both Level A and Level B. In addition, these chips are the only ASIC solutions providing conversion from Level A to Level B. The full set of included features makes these devices the ideal choice for 1080p 50/60 transmission.

COMPLETE VIDEO PROCESSING

Semtech serializers have the most complete video processing features available. These include, but are not limited to scrambling, TRS detection or insertion, and ancillary data insertion.

GREAT FOR DVB-ASI

All Semtech serializers are DVB-ASI capable.

AUDIO EMBEDDING

Semtech's serializers include an integrated audio embedder supporting AES, I2S, and serial audio formats.

EXCELLENT JITTER PERFORMANCE

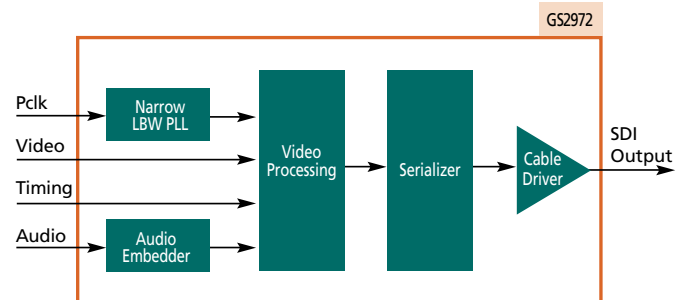
Due to the integrated PLL with narrow loop bandwidth, the serializers can reject up to 300ps of jitter on the parallel clock, outputting very low jitter, SMPTE compliant SDI signals.

POWER AND AREA EFFICIENT

The high level of integration in Semtech's serializers provides the lowest power and smallest means of implementing an SDI link.

APPLICATIONS

Cameras, camera control units, multiviewers, routers, production switchers, master control switchers, VTRs, video servers, encoders/decoders, up/down/cross converters, audio embedders, format detectors, test and measurement equipment.



SERIALIZERS													
Part Number	Data Rate (Mb/s)	Video Processing	DVB/ ASI	Ancillary Data Insert.	Audio Embed	Cable Driver	Output Jitter (ps)	Parallel Bus Width	CEA 861 Timing	Temp Range (°C)	Power (mW)	Stand-by	Pkg
GS2972	270, 1485, 2970	YES	YES	YES	YES	YES	3G: 40 HD: 50 SD: 200	10 or 20	YES	-40 to +85	400	YES	BGA 100
GS2962	270, 1485, 2970	YES	YES	YES	NO	YES	3G: 40 HD: 50 SD: 200	10 or 20	YES		350	YES	
GS1672	270, 1485	YES	YES	YES	YES	YES	HD:50 SD: 200	10 or 20	YES		350	YES	
GS1662	270, 1485	YES	YES	YES	NO	YES	HD: 50 SD: 200	10 or 20	YES		330	YES	
GS9092A	270	YES	YES	YES	NO	YES	SD: 225	10	NO	0 to +70	200	NO	QFN 56

Deserializers

The easiest, fastest, lowest power method of implementing an SDI or ASI link.



3Gb/s SDI

Semtech's GS293418 and GS293419 deserializers take integration to the next level by incorporating the latest equalization technology from Semtech's GS3440 adaptive cable EQ, the industry's longest reach EQ. The GS3418 and audio enabled GS3419 are both compact, comprehensive, single-chip receive solutions that also include a VCO, reclocker, and digital SMPTE video and audio processing. The GS3418 and GS3419 are ideally suited for long-reach applications requiring 200m of reach at 3Gb/s. Semtech's 3Gb/s SDI deserializers are fully compliant with SMPTE 424M and 425M, including support for both Level A and Level B. In addition, Semtech deserializers are the only ASIC solutions providing conversion from Level B to Level A. The full set of included features makes these devices the ideal choice for 1080p 50/60.

COMPLETE VIDEO PROCESSING

Semtech deserializers have the most complete set of video processing features available. These include, but are not limited to descrambling, word alignment, comprehensive error detection and correction, and ancillary data extraction.

GREAT FOR DVB-ASI

All Semtech receivers are DVB-ASI capable.

AUDIO DE-EMBEDDING

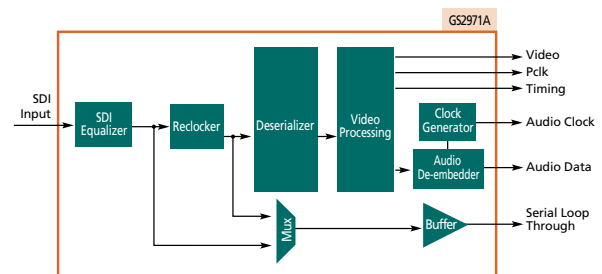
GS2971A includes an integrated audio de-embedder supporting AES, I2S, and serial audio formats. The chip also features an integrated audio clock generator.

INTEGRATED EQUALIZER

Semtech's GS2971A and GS2961A deserializers feature a high-performance integrated adaptive cable equalizer. The integration of the cable equalizer reduces overall PCB component footprint, and power requirements.

APPLICATIONS

Monitors, camera control units, multiviewers, routers, production switchers, master control switchers, VTRs, video servers, encoders/decoders, up/down/cross converters, audio de-embedders, format detectors, test and measurement equipment.



DESERIALIZERS														
Part Number	Data Rate (Mb/s)	EQ	Video Process	Serial Loop Through	IJT (UI)	ANC Extraction	Audio De-embed	Audio Clock Gen.	Par Bus Width	CEA 861 Timing	Temp Range (°C)	Power (mW)	Stand-by	Pkg
GS3419	270, 1485, 2970	YES	YES	YES	0.7	YES	YES	YES		YES		545	YES	BGA 100
GS3418	270, 1485, 2970	YES	YES	YES	0.7	YES	NO	NO		YES		515	YES	
GS2970A	270, 1485, 2970	NO	YES	YES	0.7	YES	YES	YES	10 or 20	YES	-40 to +85	350	YES	
GS2960A	270, 1485, 2970	NO	YES	YES	0.7	YES	NO	NO		YES		320	YES	
GS1661A ¹	270, 1485	YES	YES	YES	0.7	YES	NO	NO		YES		460	YES	
GS1660A ²	270, 1485	NO	YES	YES	0.7	YES	NO	NO		NO		280	YES	
GS9091B	270	YES	YES	NO	0.5	YES	NO	NO	10	NO	0 to +70	350	NO	QFN 56
GS9090B	270	NO	YES	NO	0.5	YES	NO	NO	10	NO		145	NO	

1-GS1671A audio version available, 2-GS1670A audio version available.

Crosspoint Switches

Semtech crosspoint switches provide an unmatched combination of size, features and performance. At sizes up to 290 inputs and 290 outputs, these are the largest asynchronous, fully non-blocking crosspoint switches in the industry.



MULTIPLE STROBES

Eight update enable strobe pins allow the crosspoint to be partitioned into independently updatable blocks. This is useful in multi-format environments when the switches need to occur at different points in time. Each update strobe can be assigned on a per-output basis, enabling maximum flexibility.

DATA RATE MARGIN

Supporting data rates up to 3.5Gb/s means that there is significant margin for video systems operating up to 2.97Gb/s. This margin also means the product can be used in Xaui™, DisplayPort™ and HDMI switching applications.

FULLY INDEPENDENT INPUT AND OUTPUT CHANNELS

All our crosspoints provide independent input trace equalization and output de-emphasis, which can compensate for over 50 inches of PCB trace loss. This provides higher signal integrity and lower jitter in designs utilizing long traces or passive splitting. In addition, with output swing configurable as low as 200mV, system power can be significantly reduced.

ON-CHIP PATTERN GENERATORS AND EYE PATTERN DIAGNOSTICS

Independent pattern generators and checkers can be used for testing signal paths on either the input or output side of the system. The pattern checker can be configured to check for bit errors using one of three PRBS patterns or any arbitrary pattern, important for evaluating system performance with video pathological signals. All crosspoint devices can check for bit errors at arbitrary phase offsets from the received data, and jitter margin can be determined by measurement of the horizontal eye opening.

TEMPERATURE SENSORS

Four on-chip temperature sensors monitor the junction temperature of the chip. This enables automated control of fan speed and power down sequences to meet environmental demands for energy conservation.

LOW POWER

When compared to competitive solutions, Semtech crosspoints provide industry leading per channel power consumption, with less than 1W consumed in stand-by mode. System power can be further reduced by taking advantage of the crosspoint's high input sensitivity while using Semtech equalizers configured for minimum output swing levels.

FLEXIBLE FOOTPRINT

All Semtech crosspoints are pin compatible, sharing the same control interface and register set. This allows a single platform design to be easily scaled to the necessary switch size with no re-work required in either hardware or software.

INPUT SENSITIVITY

To address losses typical in many router architectures, the Semtech crosspoint family provide for high input sensitivity, resulting in additional system margin. In addition, high input sensitivity facilitates better system optimization, including reduced swing on upstream drivers, providing substantial power savings.

APPLICATIONS

Routers, multiviewers, production switchers, master control switchers and broadcast modular equipment.

CROSSPOINT SWITCHES

	Data Rate (Gb/s)	Inputs	Input Sensitivity (mV)	Input Trace EQ	Outputs	Output De-emphasis	DC coupling	Temp Range (°C)	Power (W)	Size (mm)	Pkg
GX3290	3.5	290	80	YES	290	YES	1.2V, 1.8V, 2.5V	0 to +85	34	50x50	2377 BGA
GX3190	3.5	146	80	YES	290	YES	1.2V, 1.8V, 2.5V	0 to +85	25	50x50	2377 BGA
GX3246	3.5	290	80	YES	146	YES	1.2V, 1.8V, 2.5V	0 to +85	18	50x50	2377 BGA
GX3202	3.5	202	80	YES	202	YES	1.2V, 1.8V, 2.5V	0 to +85	24	50x50	2377 BGA
GX3146	3.5	146	80	YES	146	YES	1.2V, 1.8V, 2.5V	0 to +85	18	50x50	2377 BGA

Timing (GEN-Clocks)

A complete timing solution for broadcast video



GS4900B/GS4901B/GS4910B/GS4911B CLOCK GENERATORS

GENLOCK CAPABILITY

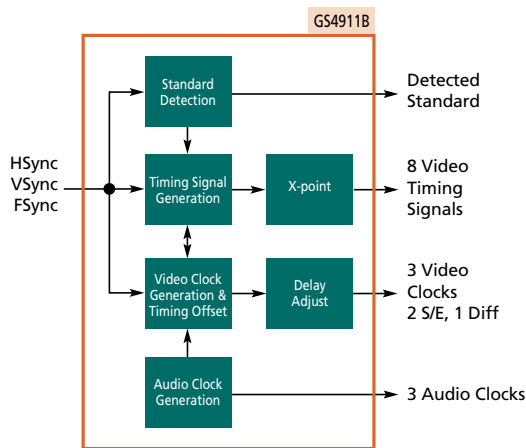
Semtech clock generators can be genlocked to reference with a variable offset. On loss of reference, the video clocks will flywheel to maintain their frequency.

GENERATES MULTIPLE CLOCKS

3 video clocks (2 single-ended and one differential), 3 single-ended audio clocks, and 8 single-ended configurable timing signals can be generated. Video clocks up to 165MHz can be produced in order to support up to 3Gb/s SDI and UXGA. In addition, the GS4911B features crosslocking capability where HD timing can be generated from an SD reference, increasing design flexibility.

INPUT STANDARD DETECTION

By supplying the clock generator with HSync, VSync and Fsync, the chip will determine if it matches one of 36 video or 16 graphics standards and will report the detected standard.



GS4915 ClockCleaner™

REDUCES JITTER TO MEET SMPTE SPECS

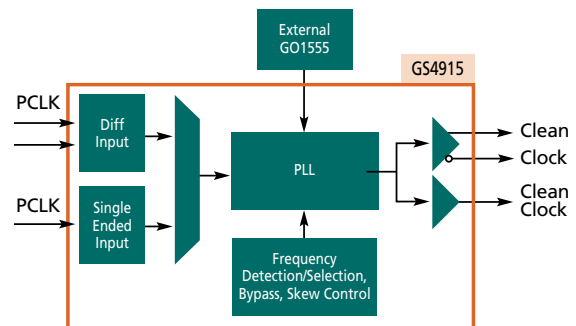
The GS4915 will reduce jitter on video clocks of 27, 74.25, 74.25/1.001, 148.5, and 148.5/1.001 MHz. Output jitter will typically be 20ps, which will guarantee 3Gb/s SDI compliance when used with a serializer.

FLEXIBLE I/O FREQUENCIES AND LEVELS

SD (27MHz), and HD (74.25, 74.25/1.001, 148.5, 148.5/1.001MHz) frequencies can be input and output from the GS4915. The chip also has single-ended and differential inputs and outputs to facilitate interfacing with a variety of chips.

FREQUENCY DOUBLER TO MEET 3Gb/s SDI REQUIREMENTS

If the input clock frequency is 74.25 or 74.25/1.001MHz, the GS4915 can double the output, providing a low jitter 148.5 or 148.5/1.001MHz output clock which can be used for HD-SDI and 3Gb/s SDI applications.



CLOCK GENERATORS										
Part Number	Input Video Standard	Output Video Standard	Max Output Video Clock (MHz)	Power Supply (V)	Pkg.	Size (mm)	Genlock	Audio Clocks	User Programmable	Power (mW)
GS4900B	3G/HD/SD/ Graphics	SD	54	3.3, 1.8	64 QFN	9 x 9	YES	NO	NO	215
GS4901B		SD	54	3.3, 1.8	64 QFN	9 x 9	YES	YES	NO	265
GS4910B		3G/HD/SD/ Graphics	165	3.3, 1.8	64 QFN	9 x 9	YES	NO	YES	250
GS4911B		165	3.3, 1.8	64 QFN	9 x 9	YES	YES	YES	300	

Evaluation Boards/Reference Design Kits (EBK/RDK)

Product Function	EBK/RDK Part	Description
SERIALIZERS		
3G SDI Serializer	EBK-GS2972-00	GS2972 evaluation board; mates with the GS2960A, GS2970A or GS2971A evaluation boards
3G SDI Serializer	EBK-GS2962-00	GS2962 evaluation board; mates with the GS2960A, GS2970A or GS2971A evaluation boards
DESERIALIZERS		
3G SDI Deserializer	EBK-GS2971A-00	GS2971A evaluation board that can mate with the GS2972 evaluation board, a Spartan-3A evaluation kit or a Cyclone III evaluation kit
3G SDI Deserializer	EBK-GS2970A-00	GS2970A evaluation board; mates with the GS2962 or GS2972 evaluation boards
3G SDI Deserializer	EBK-GS2960A-00	GS2960A evaluation board; mates with the GS2962 or GS2972 evaluation boards
SERIALIZERS & DESERIALIZERS		
3G SDI Transceiver + VOM	RDK-3GRXTXOXLNX01	RDK with 2 SDI deserializers, 2 SDI serializers and 1 VOM input; mates with Spartan-3A evaluation kit; connectors for audio insertion and extraction
3G SDI Transceiver + VOM	RDK-3GRXTXOALTR01	RDK with 2 SDI deserializers, 2 SDI serializers and 1 VOM input; mates with Cyclone III evaluation kit; connectors for audio insertion and extraction
EQUALIZERS, RECLOCKERS, CABLE DRIVERS & DC RESTORE		
3G SDI Reclocker	EBK-GS2985-QUAD00	Quad channel evaluation board, to evaluate the GS2985 performance with varying trace lengths (GS2984x3; GS2985, GS2988x4)
3G SDI Reclocker	EBK-GS2985-01	GS2985 system evaluation board (GS2984, GS2985 and GS2988)
3G SDI Equalizer	EBK-GS2993-00	GS2993 evaluation board (GS2993 only). The GS2993 offers equivalent performance to the GS2994)
3G SDI Equalizer	EBK-GS2984-00	GS2984 evaluation board (GS2984 only)
3G SDI Equalizer	EBK-GS3440-00	GS3440 evaluation board (GS3440 only)
3G SDI Equalizer	EBK-GS3441-00	GS3441 evaluation board (GS3441 only)
3G SDI Cable Driver	EBK-GS2989-00	GS2989 four output evaluation board (GS2989 only)
3G SDI DC Restore	EBK-GS2914-00	GS2914 evaluation board (GS2914 only)
SDI INPUT/OUTPUT DEVICES		
3G SDI Configurable I/O	EBK-GS3490-00	GS3490 Evaluation board (GS3490 Only)
TIMING		
SDI Timing	EBK-GS4911B-00	GS4911B evaluation board (GS4911B, GS4982)

ABOUT SEMTECH

Semtech Corporation is a leading supplier of analog and mixed-signal semiconductor platforms for high-end consumer, computing, communications and industrial applications.

Our vision is to be the global leader in analog and mixed-signal platforms enabling architectural and performance differentiation. Semtech, publicly traded since 1967, is listed on the NASDAQ Global Select Market under the symbol SMTC and has more than 31 sales and application support offices in 18 countries as well as representatives and distribution support locations in more than 30 countries.

Our proprietary platforms, differentiated by innovation, size, efficiency, performance and reach, are used in some of the most innovative systems and products in the market today. Semtech products can be found in a wide range of fast-growing market segments, including Smart Phones, LED TVs, Tablets, Wireless LAN Modems, Automated Meter Reading, Ultra-Low-Power Medical, Satellite Communication, Cellular Infrastructure, Optical Transport, Datacenters and state-of-the-art Broadcast Video industries.

More than 5,000 customers worldwide rely on our diverse product portfolio and world class technology roadmap to provide them with solutions for low-power wireless communications, optical data transport, video broadcasting, power management, circuit protection, touch sensing, and more, making Semtech one of the most balanced semiconductor companies in the industry.

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