



video



FEATURING New UHD-SDI Solutions

Broadcast Video Selector Guide

- Equalizers
- Cable Drivers
- Reclockers
- Configurable SDI I/O
- SDI Transmitters
- SDI Receivers
- Crosspoint Switches
- Timing (Gen-Clocks)

Spring 2014

End-To-End Portfolio of Broadcast Video Solutions



Semtech - Genum Products

UHD-SDI

what you know and love...only faster!

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As a pioneer in digital video, Semtech's Genum Products Group continues to lead the way in proven UHD-SDI, 3G, HD and SD technologies.

Semtech continues its leadership in SDI technology by being first to market with an array of advanced UHD-SDI solutions. In addition, Semtech's multi-rate product strategy enables customer roadmaps allowing them to create their own differentiated and advanced products. 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 Genum) 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 UHD-SDI

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.



UHD-SDI Solutions

New high-speed SDI solutions are needed as next generation broadcast television and D-Cinema applications are emerging: UHD TV-1, 4K D-Cinema, UHD TV-2, high frame rate (HFR) and high dynamic range (HDR) production. UHD-SDI enabled equipment offers a simple interface solution for the transport of high-quality, multi-media content. For more information on 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.

This commitment to the broadcast market is demonstrated by our ongoing contributions to and investments in SD, HD, 3G and UHD-SDI technology and standards leadership. 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

The Industry's best performing SDI equalizers - longest cable lengths, lowest jitter and lowest power with data rates up to 5.94 Gb/s



PERFORMANCE OPTIMIZED

Semtech offers a comprehensive range of multi-rate adaptive equalizers that support data-rates up to 5.94Gb/s and are optimized for SD, HD, 3G, 2K, 4K, UHDTV-1 and UHDTV-2 applications. The GS6140 long-reach 5.94Gb/s adaptive cable equalizer is optimized for robust performance and industry leading cable reach for applications up to 5.94Gb/s.

LOW POWER

Semtech equalizers feature low power consumption for power sensitive applications. The GS6140 features ultra-low power consumption and is ideal for applications that require both maximum performance and low power.

LONG CABLE REACH - PRODUCTION TESTED

Designed for applications requiring maximum cable reach and robust performance, the GS6140 features industry leading cable reach at all data-rates. 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 1Mb/s to 5.94Gb/s even in the presence of stressful video pathological signals they are fully SMPTE 424M, 292M, 344M and 259M compliant, and address the challenges of designing for next generation 6G UHD-SDI applications.

CROSSTALK INTERFERENCE ROBUSTNESS

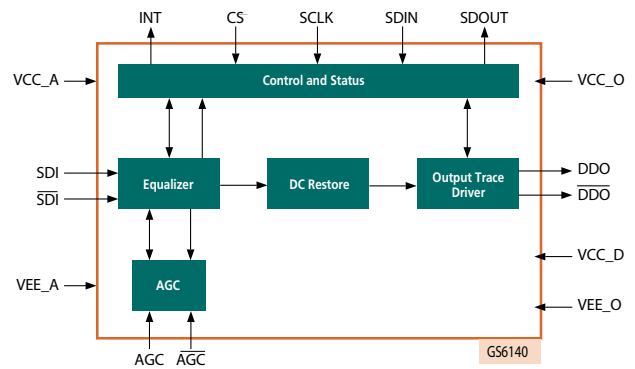
Advanced design which minimizes the effect of inter-channel crosstalk interference in high channel-density applications.

LOWEST JITTER

Semtech continues to reduce jitter at all cable lengths and for all data rates. The GS6140 offers the industry's longest cable reach with robust performance.

IMPROVED FEATURES

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



EQUALIZERS													
Part Number	Data Rate (Mb/s)	Input 0/6dB gain	Output Coupling (V)	No. of Outputs	6G Cable Length (m)	3G Cable Length (m)	HD Cable Length (m)	SD Cable Length (m)	Footprint Compat. with	Temp Range (°C)	Power (mW)	Size (mm)	Pkg
GS6140	1-5940	YES*	1.0-2.5	1	100	200	300	550		-40 to +85	83	4x4	16 QFN-COL
GS6042	125 - 5940	YES	1.2 - 3.3	1	80 SD:500	210	300	550	all 16 QFN EQs	-40 to +85	180	4x4	16 QFN
GS3440	125 - 2970	YES	1.2 - 3.3	1		210	300	550	all 16 QFN EQs	-40 to +85	180	4x4	16 QFN
GS3441	125 - 2970	YES	1.2 - 3.3	2		210	300	550	GS2993	-40 to +85	212	4x4	24 QFN
GS2993	143 - 2970	YES	1.2 - 3.3	2		140	200	400	GS3441	-40 to +85	165	4x4	24 QFN
GS2994	143 - 2970	YES	1.2 - 3.3	1		140	200	400	all 16 QFN EQs	-40 to +85	165	4x4	16 QFN
GS2984	143 - 2970	YES	2.5/3.3	1		140	200	400		-40 to +85	195	4x4	16 QFN
GS2964	143 - 2970	NO	3.3	1		100	130	170		-40 to +85	215	4x4	16 QFN
GS1674	143 - 1485	NO	3.3	1		N/A	220	400		-40 to +85	195	4x4	16 QFN
GS9074A	143 - 360	NO	3.3	1		N/A	N/A	350		0 to +70	215	4x4	16 QFN

*Features adjustable upstream launch swing compensation

Cable Drivers

Lowest jitter, best output return loss and data rates up to 5.94Gb/s



MULTI-RATE

Semtech cable drivers offer robust multi-standard operation from 143Mb/s to 5.94Gb/s and are SMPTE 424M, 292M, 344M and 259M compliant. Semtech offers a comprehensive family of Cable drivers for SD, HD, 3G, 2K, 4k, UHDTV-1 and UHDTV-2 applications

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 all 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 GS6080 and GS6081 have trace equalization to equalize long input trace lengths.

LARGER OUTPUT SWING

The GS6080 and GS6081 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

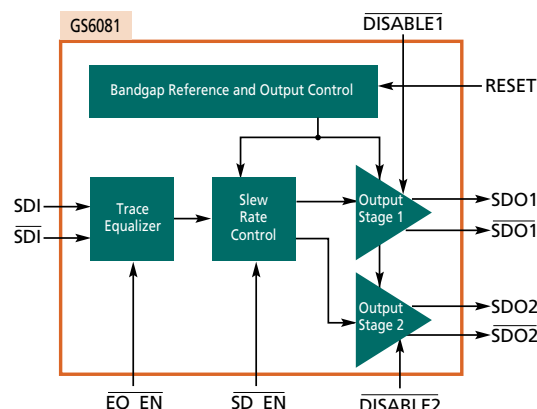
The GS6081 offers four outputs for distribution applications.

OUTPUT SIGNAL PRESENCE

The GS6080 and GS6081 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	Input Trace EQ	Output Signal Presence	Max Output Swing (mV)	ESD Prot. (kV)	ORL (dB)	Circuit Compatible with	Temp Range (°C)	Pkg
GS6080	143 - 5940	135	2.5 or 3.3	2	YES	YES	1800	2.5	3G: -15 HD: -19 6G: -10	GS2988	-40 to +85	16 QFN
GS6081		205		4	YES	YES	1800	2.5	3G: -15 HD: -19 6G: -10	GS2989		
GS2988	143 - 2970	110		2	YES	YES	1800	2.5	3G: -15 HD: -19	GS1678, GS9077		
GS2989		180		4	YES	YES	1800	2.5	3G: -15 HD: -19	GS1679		
GS1678	143 - 1485	110		2	NO	YES	1200	2.5	-19	GS2988, GS9077		
GS1679		180		4	NO	YES	1200	2.5	-19	GS2989		
GS9077	143 - 540	168	3.3	2	NO	NO	1040	4	-20	GS1678, GS2988	0 to +70	

Reclockers

Industry's best performing reclockers for all data rates up to 5.94Gb/s



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 GS6150 can be utilized to increase overall system margin. Semtech offers a complete family of reclockers for all data rates including the new GS6150 reclocker. The GS6150 Reclocker supports data rates up to 5.94Gb/s with ultra-low power consumption and is ideal for HD, 3G, 2K, 4K, UHDTV-1 and UHDTV-2 applications.

MULTI-RATE OPERATION

The GS6150 features robust multi-standard operation from 270Mb/s to 5.94Gb/s and is compatible with emerging 6G UHD-SDI standards

BEST INPUT JITTER TOLERANCE

Semtech's unique reclocker architecture offers the industry's best input jitter tolerance for worry-free design flexibility. The GS6150's high input jitter tolerance at all data rates, makes it ideal for multi-rate SDI designs.

LOWEST POWER

Semtech offers superior performance at the industry's lowest power consumption for a 6G UHD-SDI reclocker. The GS6150's ultra-low power consumption is ideal of designs with high channel density or in other applications where low power consumption is a critical design parameter.

ADDITIONAL FEATURES

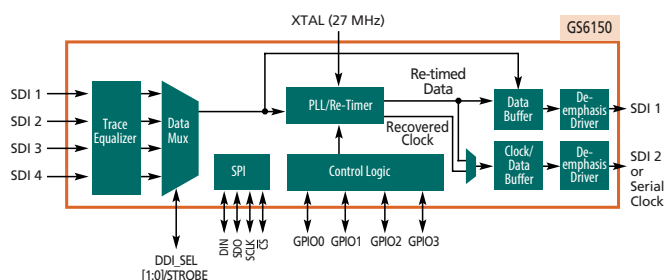
The GS6150 includes programmable trace equalization to compensate for high-frequency losses associated with board-level interconnects.

Two CML outputs interface seamlessly to devices with a CML input reference between 1.2V and 2.5V. Similarly, programmable output swing and de-emphasis provide flexibility for managing signal integrity of the output signals.

The device can operate without an external frequency reference. For applications which require rapid signal lock, an external crystal may be used to set the VCO frequency when not locked to the input signal. The presence of an external reference crystal is automatically detected by the GS6150.

SIZE

The GS6150 features a compact 6x6 48 pin QFN package. A smaller package variant, the GS6151 is also available. The GS6151 with its 4x4 32 pin QFN package is ideal for high channel density designs or other applications where the layout is constrained by available PCB real estate.



RELOCKERS												
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
GS6150	270, 1485, 2970, 5940	1.8	6G: 0.11 3G: 0.08 HD: 0.04 SD: 0.03	YES	YES	YES	4 : 1	YES	-40 to +85	130	6x6	48 QFN
GS6151	270, 1485, 2970, 5940	1.8		YES	YES	YES	2 : 1	YES	-40 to +85	130	4x4	32 QFN
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		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.

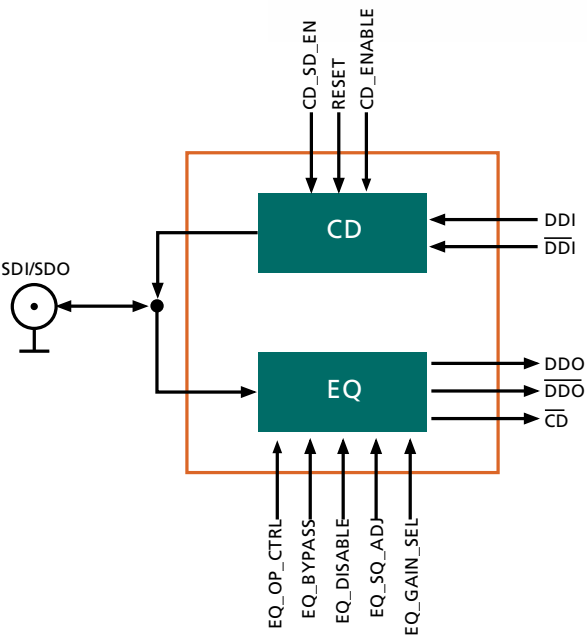
External termination network ensures full access to components which simplifies performance optimization. This provides an advantage over solutions that have internal, non-accessible termination networks

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, 260m at 1.485Gb/s and 500m at 270Mb/s (SD and DVB/ASI). External termination components allow for flexibly 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. External termination network ensures full access to components which simplifies performance optimization. This provides an advantage over solutions that have internal, non-accessible termination networks



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: 260 SD: 500	Yes	-40-85	5x5	32 QFN

Product Guide

EQUALIZERS

Part Number	Data Rate (Mb/s)	Power (mW)	6G Cable Lgth (m)	3G Cable Lgth (m)	HD Cable Lgth (m)	SD Cable Lgth (m)	Input 0/6dB gain	No. of Outputs	Output Coupling (V)	Cable Lgth Indication	Temp Range (°C)	Pkg
GS6140	1-5940	83	100	200	300	550	YES*	1	1.0 - 2.5	YES	-40 to +85	16 QFN-COL
GS6042	125 - 5940	180	80	210	300	500	YES	1	1.2 - 3.3	NO	-40 to +85	16 QFN
GS3440	125 - 2970	180		210	300	550	YES	1	1.2 - 3.3	NO	-40 to +85	16 QFN
GS3441	125 - 2970	212		210	300	550	YES	2	1.2 - 3.3	YES	-40 to +85	24 QFN
GS2993	143 - 2970	165		140	200	400	YES	2	1.2 - 3.3	YES	-40 to +85	24 QFN
GS2994	143 - 2970	165		140	200	400	YES	1	1.2 - 3.3	NO	-40 to +85	16 QFN
GS2984	143 - 2970	195		140	200	400	YES	1	2.5/3.3	NO	-40 to +85	16 QFN
GS2964	143 - 2970	215		100	130	170	NO	1	3.3	NO	-40 to +85	16 QFN
GS1674	143 - 1485	195		N/A	220	400	NO	1	3.3	NO	-40 to +85	16 QFN
GS9074A	143 - 360	215		N/A	N/A	350	NO	1	3.3	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
GS6080	143 - 5940	135	2.5 or 3.3	2	YES	YES	1800	-40 to +85	16 QFN
GS6081	143 - 5940	210	2.5 or 3.3	4	YES	YES	1800	-40 to +85	16 QFN
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
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

RECLOCKERS

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
GS6150	270, 1485, 2970, 5940	130	1.8	YES	YES	4 : 1	-40 to +85	6x6	48 QFN
GS6151	270, 1485, 2970, 5940	130	1.8	YES	YES	2 : 1	-40 to +85	4x4	32 QFN
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: 260 SD: 500	Yes	-40-85	5x5	32 QFN

SDI TRANSMITTERS									
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

SDI RECEIVERS											
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
GS2971A	270, 1485, 2970	YES	YES	YES	0.7	YES	YES	YES	-40 to +85	545	BGA 100
GS2961A	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

SDI Transmitters and Receivers

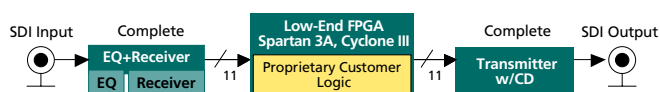
Choosing the right SDI transmitter and SDI receiver for your system

Designers have the choice of selecting components from different vendors. But when it comes to designs with SDI transmitters and SDI receivers, they must first choose an architecture. In implementing a design with a SDI transmitter and/or SDI receiver, there are 3 architectural choices: Semtech's complete SDI transmitter/SDI receiver solution architecture, an integrated-transceiver FPGA architecture and a 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 transmitter and SDI receiver 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.

Gennum: Complete Solution Transmitter/Receiver

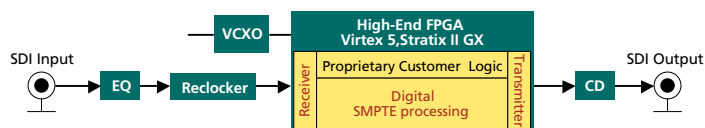


INTEGRATED-TRANSCIEVER FPGA ARCHITECTURE

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.

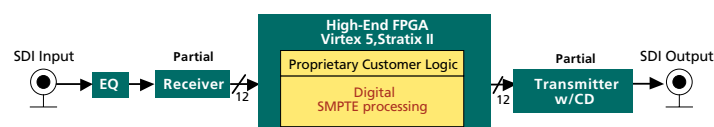
Integrated Transceiver FPGAs



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 SDI receiver/SDI transmitter, 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-Help 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	■	■	■

SDI Transmitters

The easiest, fastest, lowest power method of implementing a 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 SDI transmitters 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 SDI transmitters are DVB-ASI capable.

AUDIO EMBEDDING

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

EXCELLENT JITTER PERFORMANCE

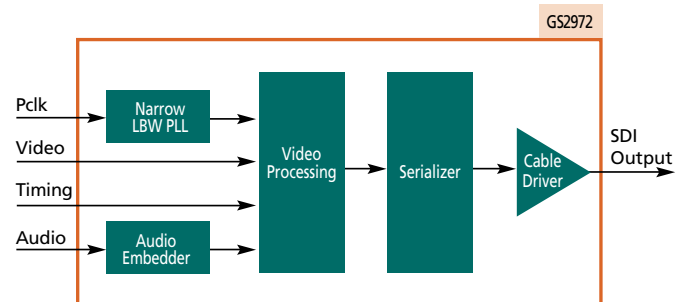
Due to the integrated PLL with narrow loop bandwidth, the SDI transmitters can reject up to 300ps of jitter on the parallel clock, outputting very low jitter, SMPTE compliant SDI signals.

POWER AND AREA EFFICIENT

The high level of integration in Semtech's SDI transmitters provides the lowest power and smallest means of implementing a 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.



SDI TRANSMITTERS

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

SDI Receivers

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



3Gb/s SDI

Semtech's GS2971A and GS2961A take integration to the next level by incorporating Cable Equalization technology to deliver a fully integrated Multi-Rate SDI Receiver. The GS2961A and audio enabled GS2971A are both compact, comprehensive, single-chip receive solutions that also include a VCO, reclocker, and digital SMPTE video and audio processing. The GS2971A and GS2961A are ideally suited for long-reach applications requiring 140m of reach at 3Gb/s. Semtech's 3Gb/s SDI receivers are fully compliant with SMPTE 424M and 425M, including support for both Level A and Level B. In addition, Semtech SDI receivers 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 SDI receivers 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

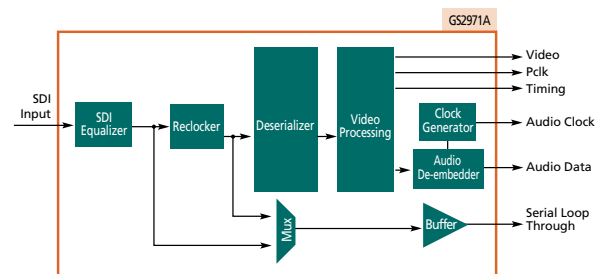
GS2971A includes an integrated audio de-embedder supporting AES, I2S, and serial audio formats. The chip also features an integrated audio clock generator.

INTEGRATED EQUALIZER

Semtech's GS2971A and GS2961A SDI receivers 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.



SDI RECEIVERS														
Part Number	Data Rate (Mb/s)	EQ	Video Process	Serial Loop Through	IJT (UI)	ANC Extrac-tion	Audio De-embed	Audio Clock Gen.	Par Bus Width	CEA 861 Timing	Temp Range (°C)	Power (mW)	Stand-by	Pkg
GS2971A	270, 1485, 2970	YES	YES	YES	0.7	YES	YES	YES	10 or 20	YES	-40 to +85	545	YES	BGA 100
GS2961A	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		YES		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

Part Number	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

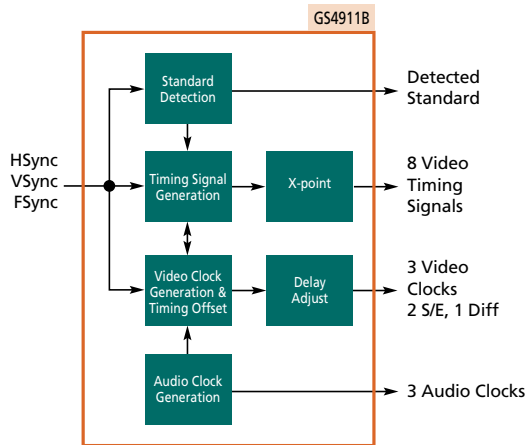
Semtech clock generators can be genlocked to reference with a variable offset. On loss of reference, the video clocks will flywheel to maintain their frequency.

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

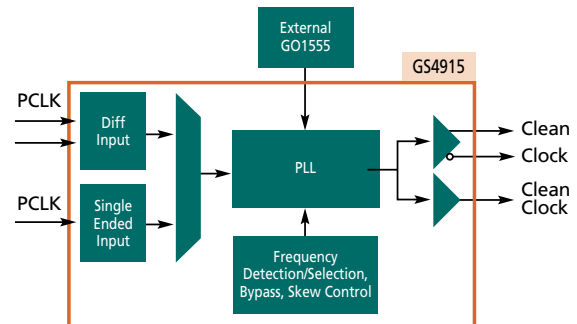
The GS4915 will reduce jitter on video clocks of 27, 74.25, 74.25/1.001, 148.5, and 148.5/1.001 MHz. Output jitter will typically be 20ps, which will guarantee 3Gb/s SDI compliance when used with a SDI transmitter.

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
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SDI TRANSMITTERS

3G SDI Transmitter	EBK-GS2972-00	GS2972 evaluation board; mates with the GS2960A, GS2970A or GS2971A evaluation boards
3G SDI Transmitter	EBK-GS2962-00	GS2962 evaluation board; mates with the GS2960A, GS2970A or GS2971A evaluation boards

SDI RECEIVERS

3G SDI Receiver	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 Receiver	EBK-GS2970A-00	GS2970A evaluation board; mates with the GS2962 or GS2972 evaluation boards
3G SDI Receiver	EBK-GS2960A-00	GS2960A evaluation board; mates with the GS2962 or GS2972 evaluation boards

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)
6G SDI Equalizer	EBK-GS6042-00	GS6042 evaluation board (GS6040 only)
3G SDI Equalizer	EBK-GS3440-00	GS3440 evaluation board (GS3440 only)
3G SDI Equalizer	EBK-GS3441-00	GS3441 evaluation board (GS3441 only)
6G SDI Cable Driver	EBK-6080-00	GS6080 Evaluation board (GS6080 only)
3G SDI Cable Driver	EBK-GS2989-00	GS2989 four output evaluation board (GS2989 only)

SDI INPUT/OUTPUT DEVICES

3G SDI Configurable I/O	EBK-GS3490-00	GS3490 Evaluation board (GS3490 Only)
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TIMING

SDI Timing	EBK-GS4911B-00	GS4911B evaluation board (GS4911B, GS4982)
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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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