

New Product Highlights



Q1 CY2013 (February - April)

FEATURE PRODUCTS

PROTECTION

RClamp 582BQ – Low Capacitance TVS for Automotive Applications

RClamp 3374N – High Power TVS for Ethernet Interfaces

POWER MANAGEMENT

SC4215J – Very Low Input /Very Low Dropout

2 Amp Regulator With Soft-Start

SC3102 – 2A Synchronous Step-Down Regulator

WIRELESS & SENSING

SX1272/1273 – 860-1050 MHz Ultra Low Power Long Range Transceiver

SX9300 – Ultra Low Power, Dual Channel Smart Proximity SAR Compliant Solution

GENNUM PRODUCTS

GN1157 – Multi-Rate LR Transceiver Chip for DFB based SFP+ modules

NT22031/22012 – 125 Mbps POF 650nm Transceiver chipset

GS3440 – Extended Reach 3G/HD/SD Adaptive Cable Equalizer

GS3480 – Dual-Slew-Rate, Dual-Output Cable Driver with Signal-Boost™



PROTECTION PRODUCTS

Features

- Transient protection for high-speed data lines to
 - IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (air), $\pm 25\text{kV}$ (contact)
 - IEC 61000-4-4 (EFT) 40A (5/50ns)
- Qualified to AEC-Q100, Grade 2
- Protects up to two I/O lines
- Low capacitance ($< 1.2\text{pF}$)
- High surge capability: 15A ($t_p=8/20\mu\text{s}$)
- Low leakage current and clamping voltage
- Low operating voltage: 5.0V
- Solid-state silicon-avalanche technology

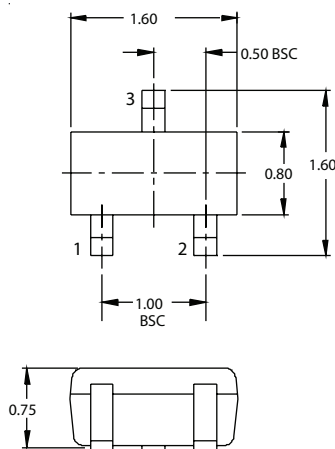
Mechanical Characteristics

- SC-75 (SOT-523) package
- Lead finish: Matte tin
- Pb-Free, Halogen Free, RoHS/WEEE Compliant
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel

Applications

- USB 2.0
- Video lines
- LVDS lines

Dimension



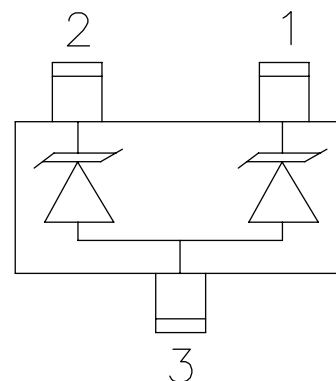
Nominal Dimensions (mm)

Description

The RClamp® 0582BQ transient voltage suppressor is specifically designed to protect sensitive components that are connected to high-speed data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (cable discharge events), and EFT (electrical fast transients). It is rated to Grade 2 of AEC-Q100 for use in automotive applications.

The RClamp® 0582BQ features high peak pulse current capability ($I_{pp}=15\text{A}$, $t_p=8/20\mu\text{s}$) for use in applications that require high surge immunity testing. It has a maximum capacitance of only 1.2pF (pin 1 or 2 to pin3). It may be used to meet the ESD immunity requirements of IEC 61000-4-2 ($\pm 30\text{kV}$ air, $\pm 25\text{kV}$ contact discharge). Each device can be configured to protect 1 bidirectional line or two unidirectional lines. This device is in a small SC-75 (SOT-523) package and features a lead-free, matte tin finish. It is compatible with both lead free and SnPb assembly techniques. The combination of small size, low capacitance, and high level of surge protection makes it a flexible solution for protection of USB 2.0, LVDS, and video interfaces.

Schematic & Pin Configuration



SC-75 3L (Top View)

PROTECTION PRODUCTS

Features

- Transient protection for high-speed data lines to
 - IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (air), $\pm 30\text{kV}$ (contact)
 - IEC 61000-4-4 (EFT) 40A (5/50ns)
 - IEC 61000-4-5 (Lightning) 40A (8/20 μs)
- Array of surge-rated diodes with internal TVS Diode
- Qualified to AEC-Q100 Grade 1 (-45 to +125°C)
- Protects up to eight lines
- Low capacitance for high-speed interfaces
- Low variation in capacitance vs. bias voltage
- Low clamping voltage
- Low operating voltage: 3.3V
- Solid-state silicon-avalanche technology

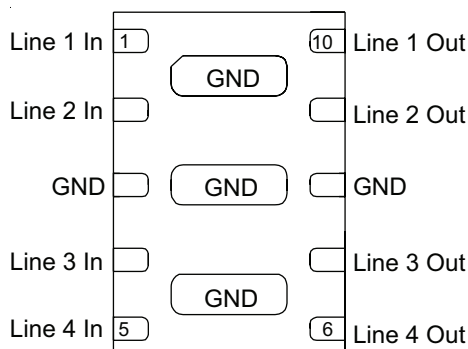
Mechanical Characteristics

- SLP3020N10 10L package
- Pb-Free, Halogen free, RoHS/WEEE Compliant
- Nominal dimensions: 3.0 x 2.0 x 0.60 mm
- Lead finish: NiPdAu
- Molding compound flammability rating: UL 94V-0
- Marking: Marking code + Date code
- Packaging: Tape and Reel

Applications

- 10/100/1000 Ethernet
- Automotive
- Central office equipment
- LVDS interfaces
- MagJacks / Integrated Magnetics
- Notebooks / Desktops / Servers

Pin Configuration

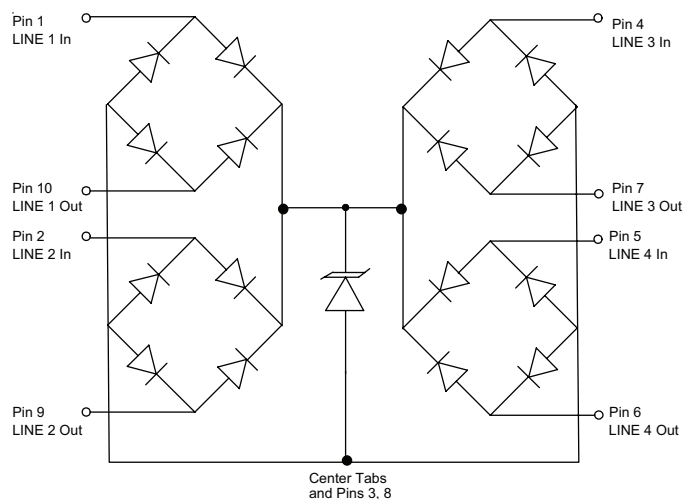


Description

The unique design incorporates surge-rated, low capacitance steering diodes and a TVS diode in a single package. The RClamp® 3374N is designed to replace up to two components for board level GbE protection. Each device is designed to protect two line pairs. This is accomplished by routing traces through the device. When connected in this fashion, the device can withstand a high level of surge current (40A, 8/20 μs) while maintaining a low loading capacitance of less than 5pF. The high surge capability means it can be used in high threat environments in applications such as Gigabit Ethernet, telecommunication lines, and LVDS interfaces.

The RClamp® 3374N is constructed using Semtech's proprietary EPD process technology. The EPD process provides low stand-off voltages with significant reductions in leakage current and capacitance over silicon-avalanche diode processes. It features a true operating voltage of 3.3 volts for superior protection. The RClamp® 3374N is in a 10-pin SLP3020N10 package. It measures 3.0 x 2.0 x 0.60mm. The leads are finished with lead-free NiPdAu.

Circuit Diagram



POWER MANAGEMENT PRODUCTS

Features

- Input voltage as low as 1.4V
- 400mV Dropout @ 2A
- Adjustable output from 0.5V
- 1ms internal Soft-Start minimizes inrush current
- Over current and over-temperature protection
- Enable function option
- 10µA quiescent current in shutdown
- Reverse blocking from output to input
- Full industrial temperature range
- Fully WEEE and RoHS compliant

Applications

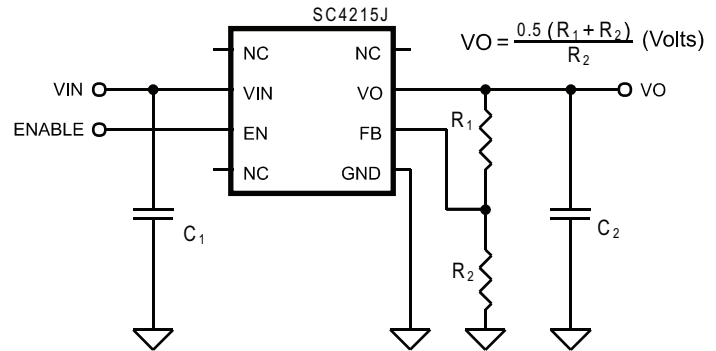
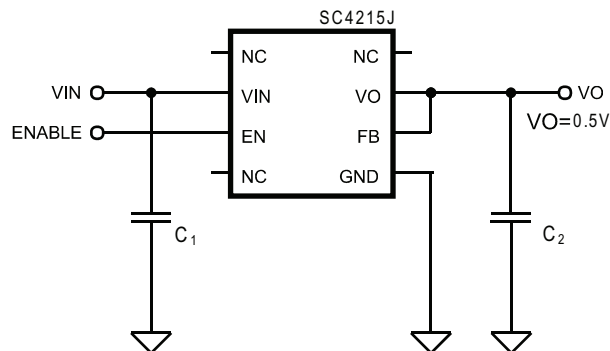
- Telecom and networking cards
- Motherboards and peripheral cards
- Industrial applications
- Wireless infrastructure
- Medical equipment

Description

The SC4215J is a high performance positive voltage regulator designed for use in applications requiring very low input voltage and very low dropout voltage at up to 2 amperes. It operates with a V_{in} as low as 1.4V, with output voltage programmable as low as 0.5V. The SC4215J features ultra low dropout, ideal for applications where V_{out} is very close to V_{in} . Additionally, the SC4215J has an enable pin to further reduce power dissipation while shutting down. The SC4215J provides excellent regulation over variations in line, load and temperature.

The SC4215J is available in the SOIC-8-EDP (Exposed Die Pad) package. The output voltage can be set via an external divider or to a fixed setting of 0.5V depending upon how the FB pin is configured.

Typical Application Circuit Diagram



POWER MANAGEMENT PRODUCTS

Features

- V_{IN} Range: 2.9 – 5.5V
- Preset V_{OUT} Range: 1.0V to 3.3V
- Up to 2A output current
- Ultra-small footprint, <1mm height
- 1.5MHz switching frequency
- Selectable forced PSAVE or forced PWM operation
- Efficiency up to 95%
- Low output noise across load range
- Excellent transient response
- Start up into Pre-Bias output
- 100% Duty-Cycle low dropout operation
- <1 μ A Shutdown current
- Externally programmable Soft-Start time
- Power Good indicator
- Input under-voltage lockout
- Output over-voltage, current limit protection
- Over-Temperature protection
- 3mm x 3mm x 0.6mm thermally enhanced
- MLPQ-UT16 package
- -40 to +85°C temperature range
- Pb-free, Halogen free, and RoHS/WEEE compliant

Applications

- Office automation
- Switches and routers
- Network

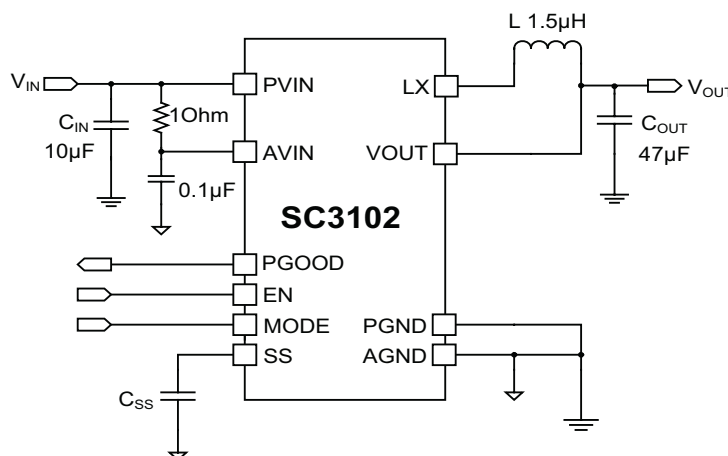
Description

The SC3102 is a 2A synchronous step-down regulator designed to operate with an input voltage range of 2.9V to 5.5V. The device requires minimal external components for a complete step-down regulator solution. The output voltage is factory predetermined with an available range of 1.0V to 3.3V.

The SC3102 is optimized for maximum efficiency over a wide range of load currents. During full load operation, the SC3102 operates in forced PWM mode with a fixed 1.5MHz oscillator frequency, allowing the use of small surface mount external components. As the load decreases, the regulator has the option to transition, via the MODE pin, into forced Power Save mode to maximize efficiency or to stay in forced PWM mode.

The SC3102 offers output short circuit and thermal protection to safeguard the device under extreme operating conditions. The enable pin provides on/off control of the regulator. When connected to logic low, the device enters shutdown and consumes less than 1 μ A of current. Other protection features include programmable soft-start with Power Good indicator, over-voltage protection and under-voltage lockout. The SC3102 is available in a thermally-enhanced, 3mm x 3mm x 0.6mm MLPQ-UT16 package and has a rated temperature range of -40 to +85°C.

Typical Application Circuit Diagram



WIRELESS & SENSING PRODUCTS

Features

- 158 dB maximum link budget
- +20 dBm - 100 mW constant RF output vs. V supply
- +14 dBm high efficiency PA
- Programmable bit rate up to 300 kbps
- High sensitivity: down to -138.5 dBm
- Bullet-proof front end: IIP3 = -12 dBm with FSK
- 100 dB blocking immunity
- Low RX current of 10 mA, 200 nA register retention
- Fully integrated synthesizer with a resolution of 61 Hz
- FSK, GFSK, MSK, GMSK, LORA and OOK modulations
- Built-in bit synchronizer for clock recovery
- Sync word recognition
- Preamble detection
- 115 dB+ Dynamic Range RSSI
- Automatic RF Sense with ultra-fast AFC
- Packet engine up to 64 bytes with CRC
- Built-in temperature sensor and low battery indicator

Description

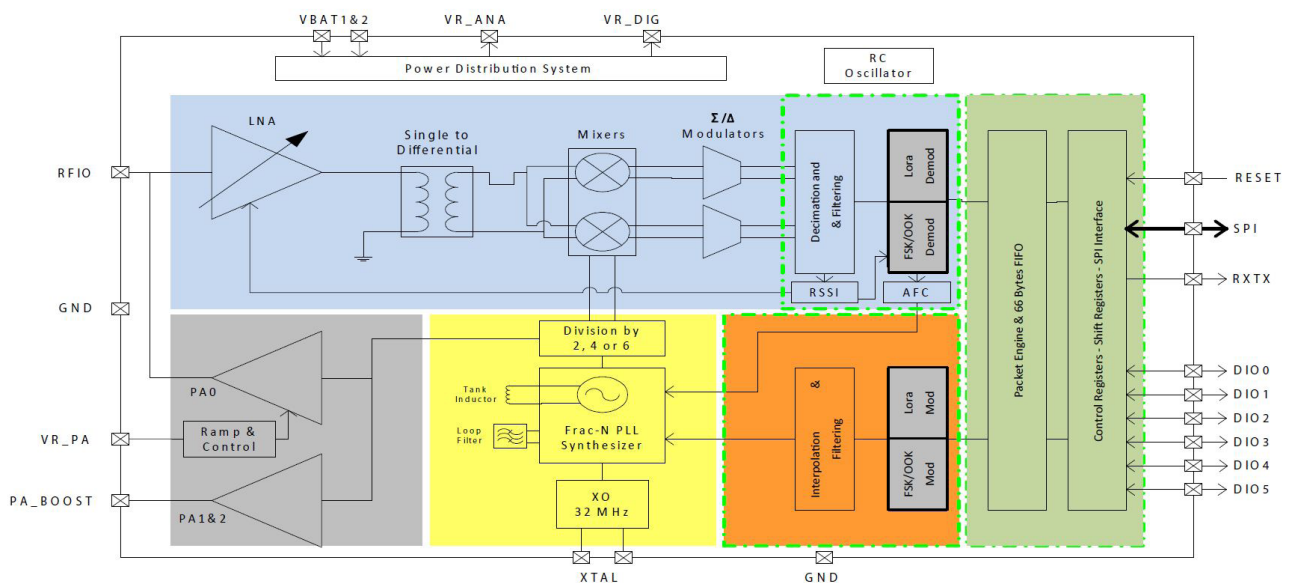
Semtech’s SX1272/73 family provides ultra long range while maintaining low current consumption, making it optimal for numerous applications. With Semtech’s patented modulation technique the device can achieve sensitivity of over -138.5 dBm using a low cost crystal and bill of materials. The high sensitivity combined with the integrated +20 dBm power amplifier creates the highest link budget making it optimal for any application requiring range. This modulation technique also provides significant advantages in blocking and selectivity over FSK.

The devices also support high performance (G)FSK for WMBus, IEEE802.15.4g, and other legacy modes. Semtech’s technology overcomes a typical trade-off of performance vs. current consumption. The devices deliver exceptional phase noise, selectivity, receiver linearity, and IIP3 for significantly lower current consumption than competing devices. The devices cover the frequency band from 860-1050MHz.

Applications

- Automated meter reading
- Home and building automation
- Wireless alarm and security systems
- Industrial monitoring and control

Typical Application Circuit Diagram



WIRELESS & SENSING PRODUCTS

Features

- 2.7 – 5.5V input supply voltage
- Dual SAR capacitive sensor inputs
 - On-Chip SAR engine for body vs. inanimate object detection
 - Stable proximity sensing with temperature
 - 20mm detection distance
 - Capacitance offset compensation up to 30pF
- Active sensor guarding
- Automatic calibration
- Ultra low power consumption:
 - Active mode: 170 uA
 - Doze mode: 18 uA
 - Sleep mode: 2.5 uA
- 400kHz I²C serial interface
- Four programmable I²C Sub-Addresses
- Input levels compatible with 1.8V host processors
- Open drain NIRQ interrupt pin
- Three (3) reset sources: POR, NRST pin, soft reset
- -40°C to +85°C Operation
- Compact size: 3 x 3mm thin QFN package
- Pb & Halogen Free, RoHS/WEEE compliant

Applications

- SAR compliant systems
- Notebooks
- Tablets
- Mobile phones
- Mobile hot spots

Description

The SX9300 is the world's first dual channel capacitive Specific Absorption Rate (SAR) controller that accurately discriminates between an inanimate object and human body proximity. The resulting detection is used in portable electronic devices to reduce and control radio frequency (RF) emission power in the presence of a human body, enabling significant performance advantages for manufacturers of electronic devices with electromagnetic radiation sources to meet stringent emission regulations' criteria and Specific Absorption Rate (SAR) standards.

Operating directly from an input supply voltage of 2.7 to 5.5V, the SX9300 outputs its data via a 1.65 – 5.5V host compatible I²C serial bus. The I²C serial communication bus port is compatible with 1.8V host control to report body detection/proximity and to facilitate parameter settings adjustment. Upon proximity detection, the NIRQ output asserts, enabling the user to either determine the relative proximity distance or simply obtain an indication of detection.

The SX9300 includes an on-chip auto-calibration controller that regularly performs sensitivity adjustments to maintain peak performance over a wide variation of temperature, humidity and noise environments, providing simplified product development and enhanced performance. A dedicated transmit enable (TXEN) pin is available to synchronize proximity measurements to RF transmission, enabling very low supply current and high noise immunity by only measuring proximity when requested.

GENNUM PRODUCTS**Features**

- Power Dissipation 185 mW Typ (IBIAS= 0 mA, IMOD = 0mAppd)
- DFB/FP Laser Driver:
 - Optional integrated closed loop Automatic Power Control (APC)
 - Compatible with microcontroller based modulation current/temperature look-up table
 - Programmable Tx eye shaping features and input equalization
 - Programmable rise/fall times
 - Maximum modulation current into 15 Ohm differential
 - Maximum bias current = 120mA
 - Laser safety features
 - Switchable Tx polarity invert
- Limiting Amplifier Receiver:
 - Rx sensitivity at 11.317Gb/s less than 10mVppd
 - Programmable bandwidth
 - Rx output preemphasis and squelch
 - Programmable Rx output swing
 - Programmable rise/fall times
 - Adjustable loss of signal detect threshold
 - Switchable Rx polarity invert
- Measurement of digital diagnostic and monitoring parameters
- 2-wire serial interface for host communication
- Software selectable power-down modes
- 3.3V or 2.5V CMOS inputs and open drain outputs for control and status lines.

Description

The GN1157 is a multirate transceiver IC designed specifically for datacom and telecom applications. The transmit DFB/FP laser driver is an advanced design that is focused on delivering excellent optical performance while still achieving low power (enabling sub-800mW LR SFP+ module implementations).

Applications

- SFP+ and XFP modules for 1G to 11.3G Ethernet applications including:
 - 10G Ethernet
 - 6G and 10G CPRI

Packaging

- 4mm x 4mm 28 pin QFN



GENNUM PRODUCTS

Features

- LVPECL and CML compatible I/O
- 3.3V single supply
- Fabricated in standard high-volume, low cost, 'digital' CMOS process
- High temperature operation (up to 125 °C junction temperature)
- No external components required (apart from LED and Photodiode)
- Programmable, temperature compensated, LED/RCLED drive current to 25mA
- Less than 14.5 mA total current consumption (excluding drive current)
- -29 dBm sensitivity, 0 dBm overload at 125 Mbps (BER 1E-12, 0.3 A/W PIN)
- Receiver loss of signal/Signal detect function
- Receiver mean power photodiode current monitor output

Description

The NT22031 LED/RCLED transmitter driver and NT22012 TIA/Limiting amplifier receiver ICs are Semtech's new complete chipset for Plastic Optical Fiber (POF) transceiver applications. Designed to operate up to 125 Mbps, they can be used in industrial automation and home networking applications to provide an extremely reliable and electrically immune communications channel.

Examples of the uses of POF and POF transceivers include set-top box connectivity to the home gateway (IP router), industrial control networks for factory automation, high voltage electrical environments that require electrically isolated networks (e.g. wind turbines, generators, etc.) and electrically sensitive environments that require robust communications (e.g. medical sensing – MRI scanners). The Semtech POF transceiver chipset provides the most flexible, lowest power and highest performance solution available.

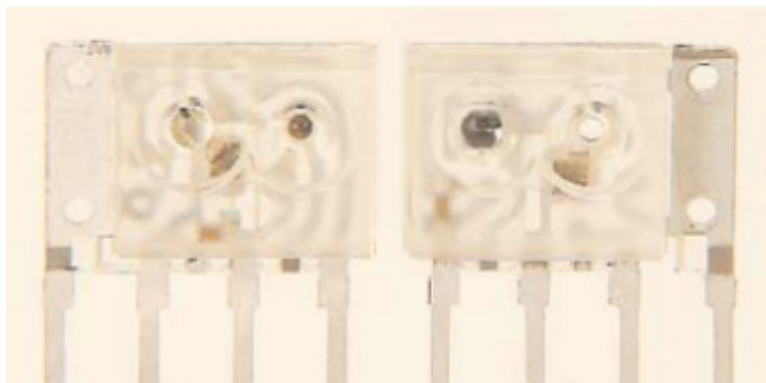
Applications

- Industrial fast ethernet POF transceivers
- Electrically isolated communication and control channels
- Fast ethernet home networking

Packaging

- Bare die products
- NT22031 – 0.90mm x 1.08mm
- NT22012 – 1.08mm x 1.31mm

Picture of the package



Picture shows NT22031/NT22012 ICs in plastic molded packages. ICs sold as bare die only.

GENNUM PRODUCTS

Features

- SMPTE ST 424, SMPTE ST 292 and SMPTE ST 259 compliant
- Automatic cable equalization
- Multistandard operation from 125Mb/s to 2.97Gb/s
- Performance optimized for 270Mb/s, 1.485Gb/s and 2.97Gb/s. Typical equalized length of Belden 1694A cable up to:
 - 210m at 2.97Gb/s
 - 300m at 1.485Gb/s
 - 550m at 270Mb/s
- Supports DVB-ASI at 270Mb/s
- Supports MADI at 125Mb/s
- Manual bypass (useful for low data rates with slow rise/fall times)
- Programmable carrier detect with squelch threshold adjustment
- Automatic power-down on loss of signal
 - Standby power <35mW (typical)
- Differential output supports DC-coupling from 1.2V to 3.3V CML logic
- Option to compensate for 6dB flat attenuation prior to input of device
- Selectable output deemphasis: 2dB, 4dB and 6dB
- Standard EIA/JEDEC logic control and status signal levels
- Single 3.3V power supply operation
- 180mW power consumption (typical)
- Wide operating temperature range of -40°C to +85°C
- Small footprint QFN package (4mm x 4mm)
 - Footprint compatible with the GS2974A, GS2974B
 - GS2984 and GS2994
- Pb-free and RoHS compliant

Applications

- SMPTE ST 424, SMPTE ST 292 and SMPTE ST 259 coaxial cable serial digital interfaces

Description

The GS3440 is a high-speed BiCMOS device designed to equalize and restore signals received over 75Ω coaxial cable. The device is designed to support SMPTE ST 424, SMPTE ST 292 and SMPTE ST 259 and is optimized for performance at 270Mb/s, 1.485Gb/s and 2.97Gb/s.

The GS3440 features DC restoration to compensate for the DC content of SMPTE pathological signals. The Carrier Detect output pin (CD) indicates whether an input signal has been detected. It can be connected directly to the SLEEP pin to enable automatic sleep on loss of carrier.

A voltage programmable threshold, set via the SQ_ADJ pin, forces CD high when the input signal amplitude falls below the threshold. This allows the GS3440 to distinguish between low-amplitude SDI signals and noise at the input of the device.

The equalizing and DC restore stages are disengaged and no equalization occurs when the BYPASS pin is HIGH. Setting the BYPASS pin HIGH is useful for signals launched at the signal source with low data rates and/or slow rise/fall times.

The GS3440 features a gain selection pin (GAIN_SEL) which can be used to compensate for 6dB flat attenuation prior to the input of the device. The differential output can be DC-coupled to Semtech's reclockers and cable drivers, as well as industry-standard 1.2V, 1.8V, 2.5V and 3.3V CML logic by changing the voltage applied to the VCC_O pin. In general, DC coupling to any termination voltage between 1.2V and 3.3V is supported.

The GS3440 also features programmable output deemphasis with three, user-selectable operating levels to support long PCB traces at the output of the device. The device comes in a 16-pin, 4mm x 4mm QFN package and is footprint compatible with Semtech's GS2974A, GS2974B, GS2984 and GS2994 equalizers. Power consumption of the GS3440 is typically 180mW when DC-coupled at 1.2V.

GENNUM PRODUCTS**Features**

- SMPTE ST 424, SMPTE ST 292, and SMPTE ST 259 compliant
- Two positive single-ended outputs
 - selectable slew rate
 - adjustable output swing from 400mVpp to 2400mVpp single-ended
 - independent ENABLE for each output
- Configurable Signal-Boost™ on all outputs
 - programmable to +9dB in 1dB increments
 - independent selection for both outputs
- Supports DVB-ASI at 270Mb/s
- Wide common-mode range input buffer:
 - 100mV sensitivity
 - supports DC-coupling to industry-standard differential logic
 - on-chip 100Ω differential input termination
- Device may be configured by pin or by register (GSPI) settings
- Device status information can be read from the internal registers using the host interface (GSPI)
- High-speed input signal trace equalization
- Signal presence indication
- 178mW typical power consumption on 2.5V supply
- Standard JEDEC logic control and status signal levels
- Operating temperature range: -40°C to +85°C
- Small-footprint QFN package (4mm x 4mm)
- Pb-free and RoHS compliant

Applications

- SMPTE ST 424, SMPTE ST 292, and SMPTE ST 259 coaxial cable serial digital interfaces

Description

The GS3480 is a high-speed BiCMOS integrated circuit designed to drive one or two 75Ω coaxial cables. It is Semtech's most advanced cable driver, offering a comprehensive feature set for today's most demanding applications.

The GS3480 operates from 0.1Mb/s to 2.97Gb/s and with two selectable slew rates providing compliance for SMPTE ST 424, SMPTE ST 292 and SMPTE ST 259 applications. The device has two single-ended positive outputs, which are suitable for driving polarity dependant signals like DVB-ASI in addition to polarity-independent signals like those of SMPTE ST 259, SMPTE ST 292 and SMPTE ST 424 SDI systems.

The GS3480 is the industry's only cable driver featuring output Signal-Boost™. With up to +9dB (adjustable in 1dB increments) of Signal-Boost™, the GS3480 is ideal for applications where compensation for long PCB trace lengths is required and for use in long-reach applications where moving the SMPTE compliance point from the device's output to a point further downstream is required. The GS3480 features the industry's largest output swing. Utilizing an external bias resistor, the single-ended output swing is adjustable from 400mVpp to 2400mVpp. High output swing can be utilized to compensate for losses that occur after the cable driver output.

The GS3480 accepts industry-standard differential input levels including LVPECL and CML. A GSPI serial interface is provided for configuration and control. Status information can also be read from the device using this serial interface. Input trace equalization compensates for up to 10 inches of FR4 trace loss. This feature can be enabled or disabled using the GSPI host interface.

Each output can also be powered down, leaving the serial data output pin in a high-impedance state. A signal presence function pin (SP) indicates whether an input signal is present, which can be used to put the device in a power-down mode. The device typically draws 35mW when in this mode.



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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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