SEMTECH
GENNUM PRODUCTS

GS6140

Multi-Rate 6G UHD-SDI Equalizer

Key Features

- Multi-standard operation at rates between 1Mb/s and 5.94Gb/s
- SMPTE ST 2081 (proposed), SMPTE ST 292 and SMPTE ST 259 compliant
- AES10 (MADI) compatible
- Industry leading cable reach, with automatic cable equalization for different lengths of cable
- Performance optimized for 125Mb/s, 270Mb/s, 1.485Gb/s, 2.97Gb/s and 5.94Gb/s. Typical equalized length of Belden 1694A cable up to:
  - 100m at 5.94Gb/s
  - 200m at 2.97Gb/s
  - 300m at 1.485Gb/s
  - 550m at 270Mb/s
- 1.8V core power supply
- 83mW when DC-coupled at +1.2V
- Ultra-low power mode for shorter cable reach applications
- Upstream launch swing compensation from 250mV$_{ppd}$ to 1000mV$_{ppd}$ in 50mV steps (Default 800mV$_{ppd}$)
- Auto/Manual bypass (useful for low data rates with slow rise/fall times)
- Robust, noise-immune signal detection with squelch threshold adjustment
- Auto/Manual control of SLEEP/MUTE/DISABLE OUTPUT modes
- Data Rate detection and indication
  - <MADI, MADI, SD, HD, 3G, 6G differentiation
- Digital cable length indication (CLI)
- Differential output supports DC-coupling from 1.0V to 2.5V CML logic and AC-coupling for other logic families
- Programmable/Rate-dependent output de-emphasis level and delay
- Host interface for status and control
- 6kV HBM ESD protection on all pins
- Wide operating temperature range of -40°C to +85°C
- Small footprint QFN–COL package (16-pin, 4mm x 4mm)
- Pb-free and RoHS compliant

Applications

- SMPTE ST 2081 (proposed), SMPTE ST 424, SMPTE ST 292, SMPTE ST 259 and AES10 coaxial cable serial digital interfaces

Description

The GS6140 is a high-speed BiCMOS device designed to equalize and restore signals received over cable.

The device is designed to support SMPTE ST 2081 (proposed), SMPTE ST 424, SMPTE ST 292, SMPTE ST 259 and AES10 (MADI), and it is optimized for performance at 125Mb/s, 270Mb/s, 1.485Gb/s, 2.97Gb/s, and 5.94Gb/s.

The device supports MADI serial signals at 125Mb/s with peak-to-peak launch amplitude between 300mV and 600mV (with AES10 spec rise and fall times) and 800mV±10% (with SD-SDI rise and fall times).

The GS6140 features DC restoration to compensate for the DC content of SMPTE pathological signals.

Loss of Signal (LOS) is detected when the input carrier is lost or signal amplitude falls below a programmable threshold. This is further processed by a filter programmable up to 1.6s before LOS status is asserted. The device can be programmed to automatically sleep/mute/disable the output on loss of signal.

An interrupt pin (INT) indicates LOS by default, and can be programmed to signal various other statuses.

When the BYPASS control bit is set, the equalizing and DC restore stages are disengaged. This is useful for signals launched at the source with low data rates and/or slow rise and fall times.

The differential output can be DC-coupled to Semtech's reclockers and cable drivers, as well as industry-standard

+1.2V, +1.8V and +2.5V CML logic by changing the voltage applied to the VCC_O pin. In general, DC-coupling to any termination voltage between +1.0V and +2.5V is supported.

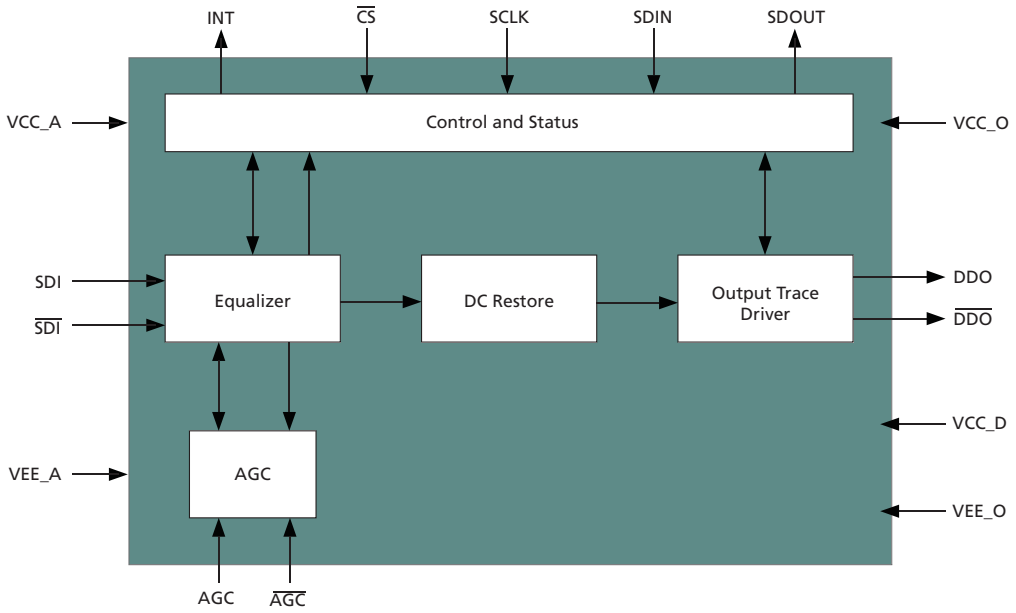
The GS6140 also features programmable output de-emphasis with eight user-selectable operating levels to support long PCB traces at the output of the device. The output swing can be programmed, via the user interface, from 250mV$_{ppd}$ to 1V$_{ppd}$ in 50mV steps.

The device comes in a 16-pin, 4mm x 4mm QFN–COL package.

Power consumption of the GS6140 is typically 83mW when DC-coupled to a +1.2V termination voltage.

The GS6140 is Pb-free, and the encapsulation compound does not contain halogenated flame retardant.

This component and all homogeneous subcomponents are RoHS compliant.



GS6140 Functional Block Diagram

DOCUMENT IDENTIFICATION
PRODUCT BRIEF

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

CAUTION

ELECTROSTATIC SENSITIVE DEVICES

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

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