**Key Features**

- Serial digital video transmitter for HD video surveillance and HDcctv applications
- Dual rate operation: 270Mb/s and 1.485Gb/s
- Supports HDcctv 1.0, HD-SDI (ST 292) and SD-SDI (ST 259)\(^1\)
- Integrated High Definition Visually Lossless CODEC (HD-VLC™) for extended cable reach:
  - 550m over Belden 543945 CCTV coax
  - 150m over Cat-5e/6 UTP cable
- Configurable 50/75Ω cable driver output, for both coaxial and twisted pair cable transmission
- Integrated audio embedder with support for up to 4 channels of I²S serial digital audio at 32kHz, 44.1kHz and 48kHz sample rates
- Downstream ancillary data insertion
- Supports both 720p and 1080p HD formats:
  - 1080p 25/29.97/30fps
  - 720p 25/29.97/30/50/59.94/60fps
- Support for both 8/10-bit and 16/20-bit BT.1120 compliant video interfaces, with embedded TRS or external HVF timing
- 4-wire Gennum Serial Peripheral Interface (GSPI 2.0) for external host command and control
- Dedicated JTAG test interface
- 1.8V core power supply and 1.8V or 3.3V digital I/O supply
- Small-footprint 84-pin dual-row QFN (7mm x 7mm)
- Low power operation, typically 180mW
- Wide operating temperature range: -20°C to + 85°C
- Pb-free and RoHS compliant

**Applications**

- HD security cameras
- Industrial cameras
- HD-SDI and HDcctv peripherals
- Media converters
- Video multiplexers

**Description**

The GV7700 is a serial digital video transmitter for High Definition component video. With integrated cable driving technology, the GV7700 is capable of transmitting HD video at a compressed 270Mb/s or an uncompressed 1.485Gb/s over 75Ω coaxial cable, or differentially over 100Ω twisted pair cable.

The GV7700 integrates the High Definition Visually Lossless CODEC (HD-VLC™) technology, which has been developed specifically to reduce the transmission data rate of HD video over both coaxial and unshielded twisted pair (UTP) cable. This is achieved by encoding the HD video, normally transmitted at a serial data rate of 1.485Gb/s, to the same rate as Standard Definition (SD) video, at 270Mb/s serial data rate.
At 270Mb/s, the effect of cable loss is greatly reduced, resulting in much longer cable transmission. For 75Ω coaxial cable, HD-VLC allows a 1.485Gb/s HD signal to be transmitted up to 3x the normal reach. In typical video over coaxial installations, when paired with Semtech’s GV7704 HD-VLC receiver, cable distances of up to 550m are possible.

The GV7700 can also be configured to transmit HD video over UTP cable, such as Cat-5e and Cat-6 cable, when HD-VLC encoded at 270Mb/s.

The device supports both 8-bit and 10-bit per pixel YCbCr 4:2:2 BT.1120 component digital video. A configurable 20-bit or 10-bit wide parallel digital video input bus is provided, with associated pixel clock and timing signal inputs. The GV7700 supports direct interfacing of HD video formats conforming to ITU-R BT.709 and BT.1120-6 for 1125-line formats, and SMPTE ST 296 for 750-line formats.

The GV7700 features an audio embedding core, which supports up to 4 channels of I2S serial digital audio within the ancillary data space of the video data stream. The audio embedding core supports 32kHz, 44.1kHz and 48kHz sample rates.

The GV7700 supports the insertion of ancillary data into the horizontal blanking of the video data stream. User data can be programmed via the GSPI, allowing downstream communication from the video source to sink device. The ancillary data packing format is compliant with HDcctv 2.0 communications protocol.

Packaged in a space-saving 84-pin dual-row QFN, the GV7700 is ideal for single PCB security cameras, where high-density component placement is required. Typically requiring only 180mW of power, the device does not require any special heat sinking or air flow, reducing the over-cost of HD security camera designs.

Frame structure with encoder HD only. Does not support SD/D1 video.
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