



NXP low-power DP-to-HDMI active level shifter PTN3363

Enhanced DP-to-HDMI connectivity for 3G, 3D, and 4K x 2K applications

As part of NXP's industry-leading family of high-performance, robust DisplayPort-to-HDMI interface solutions, this high-speed device provides exceptional signal conditioning with low active and standby power consumption in systems that support HDMI1.4B (3G, 3D, 4K x 2K).

KEY FEATURES

- ▶ DP++ interface connectivity to host CPU/GPU
- ▶ TMDS signaling/operation up to 3.4 Gbps
- ▶ Configurable receive equalization to compensate for channel attenuation
- ▶ Resistor-adjustable output signal swing
- ▶ Integrated DDC ROM for HDMI dongles
- ▶ Low active power: 72 mW
- ▶ Very low standby power: 410 μ W
- ▶ Application-friendly HVQFN32 package (5 mm x 5 mm)
- ▶ Industrial temperature range: -40 to 105 °C

KEY APPLICATIONS

- ▶ Notebook, desktop, and tablet PCs for 3G, 3D, and 4K x 2K formats
- ▶ Dongles and adapters
- ▶ Embedded systems
- ▶ Video and digital cameras, camcorders, and other portable systems

The NXP PTN3363 is a low-power, high-speed active level shifter that converts four lanes of low-swing AC-coupled differential input signals to DVI v1.0 and HDMI v1.4b compliant open-drain current-steering differential output signals. The device is capable of up to 3.4 Gbps per lane to support 36-bit deep color mode, 4K x 2K video formats, and 3D video data transport.

Each of the four lanes provides a level-shifting differential active buffer, with built-in equalization, to translate from low-swing AC-coupled differential signaling on the source side to TMDS-type DC-coupled differential current-mode signaling, terminated into 50 Ω to 3.3 V, on the sink side.

Additionally, the PTN3363 provides a single-ended active buffer for voltage translation of the HPD signal, from 5 V on the sink side to 3.3 V on the source side, and provides a channel with active buffering and level shifting of the DDC channel (consisting of a clock and a data line) between the 3.3 V source and 5 V sink. The DDC channel is implemented using active I²C-bus buffer technology that provides re-driving and level shifting.



The I²C buffer also disables the clock and data lines by isolating between the source and sink.

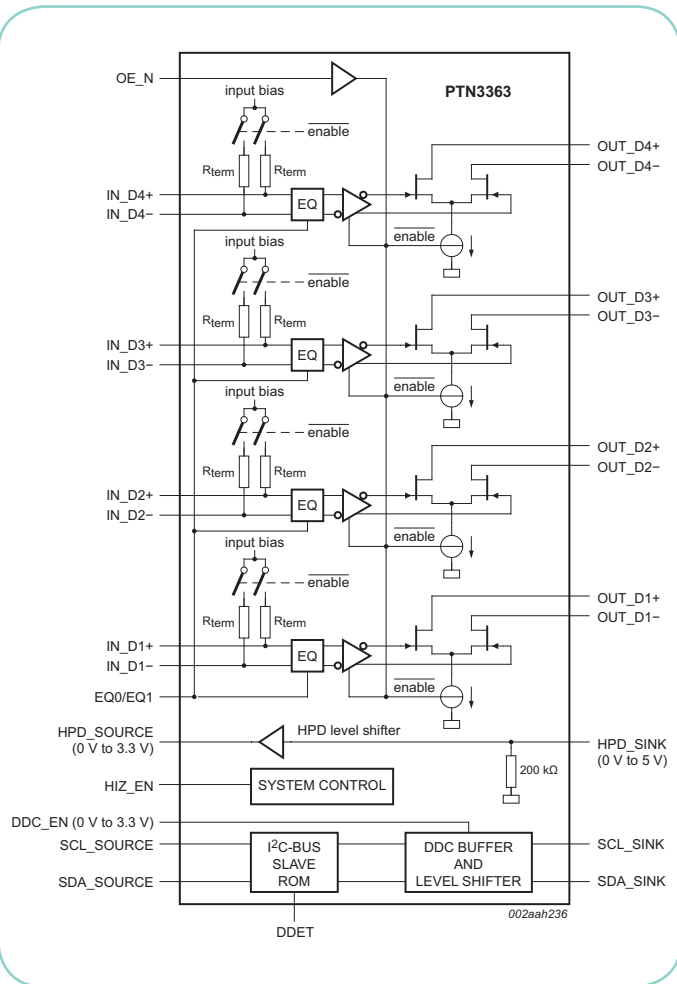
LOW-POWER ARCHITECTURE

The active level-shifting function used by the PTN3363 offers enhanced capabilities for signal conditioning and, at the same time, optimizes power consumption.

CLEAN HDMI OUTPUT

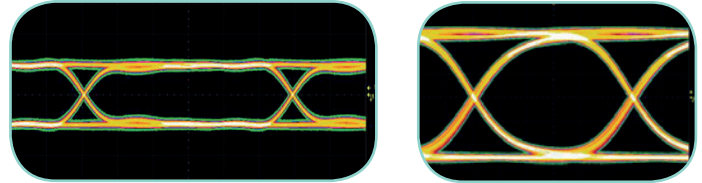
The PTN3363 reduces inter-symbol interference (ISI) and

PTN3363 block diagram



channel losses to deliver an HDMI output that meets HDMI compliance and achieves good system interoperability.

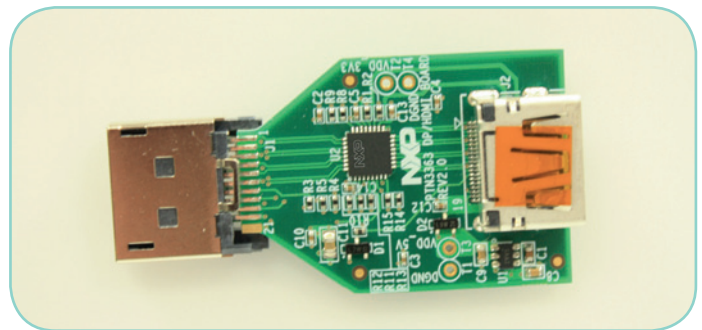
PTN3363 eye diagrams at 3 Gbps



PTN3363 in DP-to-HDMI dongle



PTN3363 DP-to-HDMI dongle board



Ordering information

For questions, e-mail interface.support@nxp.com

Type number	Orderable part number	Package	Packing method	Minimum order quantity	Temperature (T _{amb})
PTN3363BS	PTN3363BSMP	HVQFN32	Reel 13" Q2/T3 *standard mark SMD dry pack	6000	-40 °C to +105 °C

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