



# NXP DisplayPort™ PTN3392 to VGA adapter IC

## Low-cost DisplayPort™ to VGA adapter solution

NXP introduces highest-integration single chip solution for DisplayPort™ to VGA conversion, enabling high performance in small, inexpensive dongles.

### Key features

- ▶ DisplayPort™ v1.1a Receiver
  - 1 or 2 lanes
  - 2.7 Gbps or 1.62 Gbps per lane
- ▶ Analog video output
  - Triple 8-bit Digital-to-Analog Converter (DAC)
  - VSYNC and HSYNC outputs
  - Up to 240 MHz pixel clock
- ▶ Auxiliary (AUX) channel
  - Supports I<sup>2</sup>C over AUX
  - Supports MCCS, DDC-CI and DDC protocols
- ▶ Monitor presence detect
- ▶ Supports low power mode
- ▶ Single 3.3 V power supply
- ▶ Small 48-pin HVQFN package

### Applications

- ▶ Dongle computer accessories
- ▶ Desktop and notebook computers
- ▶ Notebook docking stations

### Value propositions

- ▶ Single-chip DisplayPort™ to VGA adapter solution
  - only requires external 5V regulator
  - future versions integrate 5V regulator
- ▶ Best-in-class package size
  - HVQFN48
- ▶ Best-in-class external component count and BoM cost

The PTN3392 is a DisplayPort™ to VGA adapter IC designed to connect a DisplayPort™ source to an analog display. It integrates a DisplayPort receiver and a high-speed triple video DAC, supporting display resolutions from VGA up to WUXGA. The PTN3392 supports up to two DisplayPort lanes operating at either 2.7 Gbps or 1.62 Gbps per lane, and can drive up to 1 meter of analog video cable at full performance.

The PTN3392 supports "I<sup>2</sup>C-bus over AUX" protocol conversion, and bridges the VESA DDC channel to the DisplayPort interface. PTN3392 is typically powered from the DisplayPort source side power supply, drawing less than 1 W of power. The RGB output is powered down when there is no valid DisplayPort data being transmitted, and performs monitor detection and status reporting to the source.

## DisplayPort legacy support

With the introduction of DisplayPort™, a high-bandwidth, plug-and-play digital interconnect for today and tomorrow's high-resolution digital monitors, comes the need to connect new DisplayPort-equipped laptop and desktop computers with existing displays. This installed base relies on the ability to interface DisplayPort (DP) with DVI, HDMI and VGA standards for connecting the display. NXP Semiconductors provides an extensive family of DisplayPort™ legacy support devices, including DP to DVI, DP to HDMI, and now introducing PTN3392 for DP to VGA conversion.

## High integration, low application cost

PTN3392 greatly reduces the complexity and bill of materials needed to complete a DP to VGA adapter. PTN3392 is typically powered from the DP connector and requires no additional voltage regulators to operate: all internal voltages and power is integrated on-chip from just the DP connector's single 3.3 V power supply.

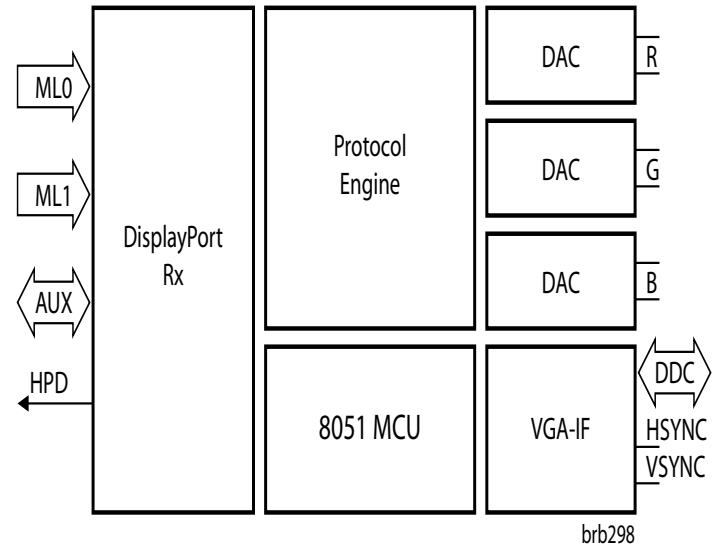
One additional external regulator is used to generate 5 V needed by the VGA connector, and an external 27 MHz crystal together with on-board crystal oscillator provides the accurate timing reference needed to deliver up to 240 MSPS (million samples per second) analog VGA output from the triple 8-bit DAC (one channel for each color – R, G and B).

## High resolution LCD support

PTN3392 supports up to 2 lanes at up to 2.7 Gbps on the DisplayPort interface. This enables VGA output bandwidths as high as WUXGA (1920x1200, 60Hz), or any lower bandwidth as required by the display attached. It supports the I<sup>2</sup>C over AUX bridging protocol, which facilitates the exchange of DDC (Direct Display Control) commands over the DisplayPort auxiliary channel.

## Compact and power-friendly design

PTN3392 performs continuous monitor presence detection, and reports the connection status back to the source. This allows the source to put PTN3392 in its low-power state whenever no monitor is connected. While connected and powered from the DisplayPort connector, PTN3392 always reports an active HIGH Hot Plug Detect (HPD) signal to the source. The HPD signal is also used to report interrupt events (such as monitor detection) back to the source. PTN3392 is optimized for VGA output and therefore does not support HDCP, nor does it support audio or other DisplayPort features not required for VGA monitors. It is housed in a 7x7 mm, 48-pin HVQFN package with 0.5 mm pin pitch. It provides robustness to 8 kV ESD (HBM and IEC61000-4-2) and is designed to prevent a powered monitor from back-powering an unpowered source. The PTN3392 is available in extended commercial temperature range: 0° ... 85° C.



Ordering information				
Typenumber	Topside mark	Package		
		Name	Description	Version
PTN3392BS	PTN3392BS	HVQFN48	Plastic thermal enhanced very thin quad flat package; no leads; 48 terminals; 7x7x0,85mm	SOT619-1

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