NXP DisplayPort-to-DVI / HDMI system solution

Robustly bridging digital display standards

The VESA-approved digital display interface, DisplayPort, is a state-of-the-art digital audio / video interconnect intended to be used primarily between a computer and its display monitor or a home-theater system. NXP's simple interfacing solution with embedded ESD protection allows you to connect a multi-standard source using a DisplayPort connector directly to a DVI or HDMI interface.

Key benefits

- Bridges different display standards
- Proven solution and reference design
- Interoperable with Intel, AMD/ATI and nVidia chipsets supporting multi-standard display standards
- A complete level shifter and ESD solution

Key features

- Level shift from DisplayPort electrical level to DVI / HDMI 3.3 V level
- Protection against ESD pulses in accordance with IEC 61000-4-2 level 4
- Automatic low-power mode based on hot plug detect
- Optional output slew-rate control on TMDS outputs to minimize EMI
- Optional HDMI dongle detection over I^2C bus (per VESA DisplayPort Interoperability Specification)
- Multiplexers support multi-mode chipset I/Os
- Long cable drive as an option

Key applications

- Desktop computers
- Notebooks computers
- Graphics cards
- Dongles, adapters
- Docking stations

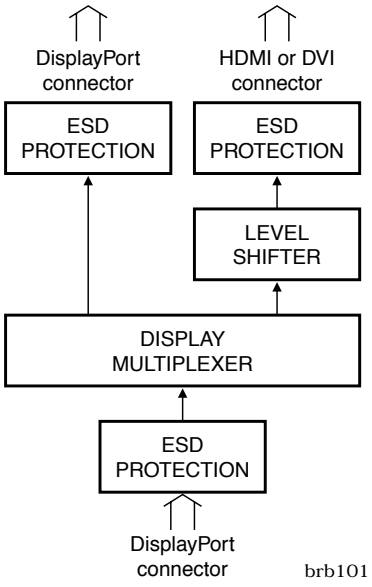
Our DisplayPort-to-DVI / HDMI system solution bridges the worlds between different display standards, connecting DisplayPort devices to DVI / HDMI displays. As well as integrated level shifting, this simple dongle design embeds full ESD protection according to IEC 61000-4-2 level 4 (8 kV contact).

The solution supports the new high-speed graphics chipsets from Intel, AMD/ATI, nVidia and others. It provides electrical-level translation from PCIe and DisplayPort signals to the current-mode outputs required to drive DVI and HDMI displays.

NXP founded by Philips

When a graphics chipset is configured to DVI or HDMI, it outputs TMDS-coded signals, while the chipset I/O pins employ AC-coupled PCI express or DisplayPort electrical levels. Electrical-level translation is necessary because DVI and HDMI use DC-coupled 3.3 V differential signaling.

Reference design block diagram



Key components

- Level shifters – PTN3300, PTN3301
- Display multiplexers – CBTL06121, CBTL06122, CBTL06141
- ESD protection – IP4220, IP4280, IP4790

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