NXP ESD protection IC IP4791

Optimized ESD protection and signal conditioning for portable HDMI

Minimize board space and reduce time-to-market with this highly integrated IC, which provides robust ESD protection, support for Hot Plug Detect, DDC, and CEC data lines, and level shifting.

Key features

- High-level ESD protection (IEC61000-4-2 level 4)
  - "Zero clamping" concept prevents ESD pulse from passing on to the system chip
- Complete support for Hot Plug Detect, DDC, CEC
  - Integrated level shifting for signal lines
  - Integrated pull-up resistors
  - Integrated CEC pull-up current source
  - Integrated power management saving 97%, when the chip is disabled
- Compatible with HDMI Type-C and Type-D connectors
- No need for Schottky diode at CEC pin
- Passes HDMI compliance on NXP reference board
- Compact SOT1156 package (2.1 x 2.5 x 0.4 mm)

Key benefits

- Minimized board space and design time
- Direct routing (even on two-layer board)
- Extended battery life due to Auto-Eco option
- Fewer components

Key applications

- Mobile phones
- DV camcorders
- Portable media players
- Digital still cameras
- PCs, notebooks, netbooks

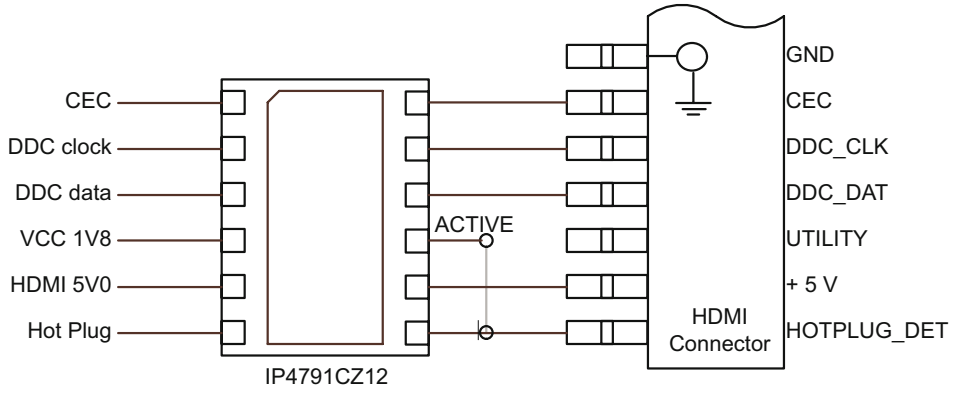
The NXP IP4791 protects mobile devices from ESD strikes when the HDMI cable is connected to a TV monitor or other consumer electronics.

It offers high-level ESD protection according to level-4 of the IEC61000-4-2 standard, provides a clean interface for HDMI signal conditioning, and performs level shifting to bridge the voltage levels used by the HDMI interface and the system chip of the mobile device. The "zero clamping" concept makes sure the ESD pulse is not passed on to the system chip. For Hot Plug Detect, DDC and CEC applications, pull-up resistors and a CEC pull-up current source are included as well. This clean interface approach minimizes board space and reduces time to market.

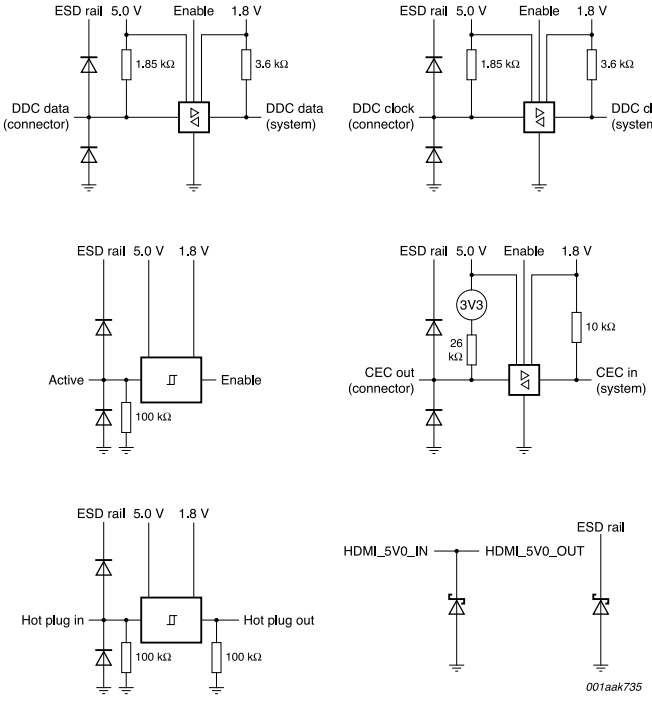
There's no need for a dedicated GPIO pin on the system controller to supervise the IP4791's power management, as long as the design has no standby functionality, such as wake-up via CEC. Connecting the ACTIVE pin to the HOTPLUG pin on the connector automatically enables or disables the chip. There's also no need for a Schottky diode at the CEC pin.

Housed in a compact SOT1156 package (2.1 x 2.5 x 0.4 mm), the IP4791 is suitable for use on a two-layer board and is easy to route, due to matched 0.4 mm trace spacing to accommodate the HDMI Type-C connector.

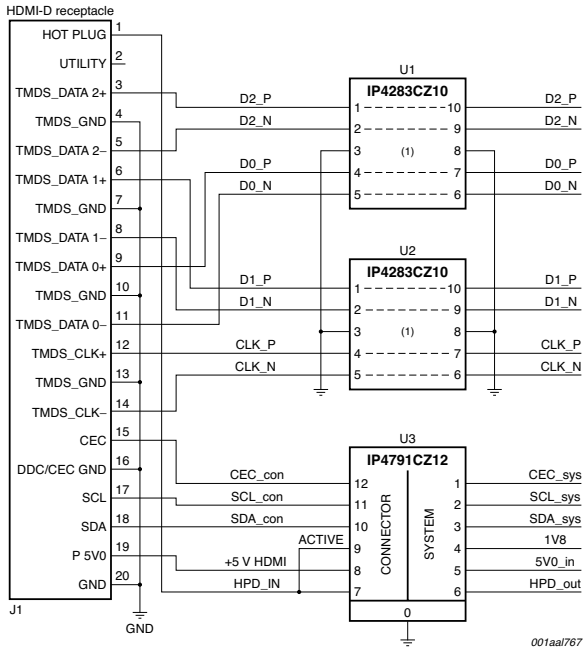
IP4791 configurations



Complete signal conditioning for HDMI interfaces



Sample IP4791 application



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