# HDMI Connector Daughter Card User Guide

**HDMI-DC-UG-v1.1**
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**www.efinixinc.com**

# Contents

# Introduction

The HDMI Connector Daughter Card (part number: EFX_HDMI) adds an HDMI interface output to the development board. The HDMI Connector Daughter Card outputs video through the on-board HDMI transmitter, U1, from Analog Devices (part number: ADV7511). The ADV7511 is set to address 0x72, and you can access it through the I$^2$C interface.

**Learn more:** Refer to the HDMI Connector Daughter Card Schematics and BOM for the part details and schematics.

*Figure 1: HDMI Connector Daughter Card*
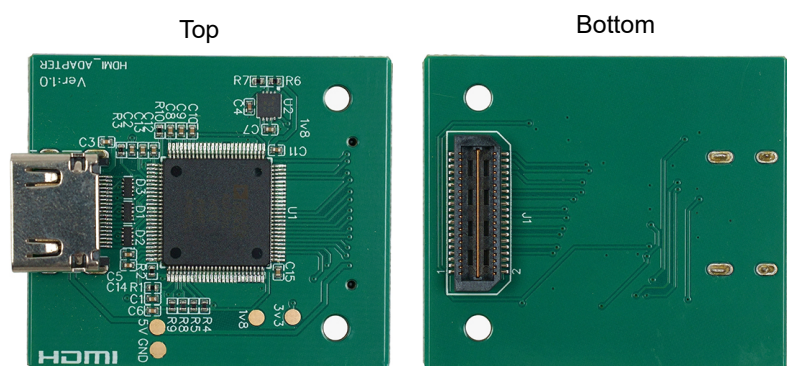


**Warning:** The board can be damaged without proper anti-static handling.

## Supported Development Boards

You can use HDMI Connector Daughter Card with:
- Titanium Ti60 F225 Development Board
- Titanium Ti180 M484 Development Board (with FMC-to-QSE Adapter Card)

# Features

- Analog Devices ADV7511 transmitter
- 225 MHz HDMI v1.4 with audio return channel (ARC)
- Supports resolutions of up to 1080p and 12-bit deep colors operation
- Power supplied from the development board; no external power required

## What's in the Box?

The HDMI Connector Daughter Card includes:
- HDMI Connector Daughter Card
- 2 standoffs
- 2 screws
- 2 nuts

# Installing Standoffs

Before using the board, attach the standoffs with the screws provided in the kit.

⚠️ **Warning:** You can damage the board if you over tighten the screws. Tighten all screws to a torque between 4 ± 0.5 kgf/cm and 5 ± 0.5 kgf/cm.

# Headers

*Table 1: HDMI Connector Daughter Card Headers*

| Reference Designator | Description |
|:---:|:---|
| AUDIO1 | HDMI output connector |
| J1 | 40-pin QTE connector bringing GPIO signals, and power from the development board. |

# J1 (QTE Connector)

J1 is a 40-pin QTE connector to connect the daughter card to the QSE connector on the development board.

*Table 2: J1 Pin Assignments*

| Pin Number | Pin Name | Description | Pin Number | Pin Name | Description |
|---|---|---|---|---|---|
| 1 | 3V3 | 3.3 V supply | 2 | HDMI_D9 | Video data |
| 3 | +5V | 5.0 V supply | 4 | CLK | Video clock |
| 5 | GND | Ground | 6 | GND | Ground |
| 7 | HDMI_D8 | Video data | 8 | HDMI_D10 | Video data |
| 9 | HDMI_D7 | Video data | 10 | HDMI_D11 | Video data |
| 11 | GND | Ground | 12 | GND | Ground |
| 13 | HDMI_D6 | Video data | 14 | HDMI_D12 | Video data |
| 15 | HDMI_D5 | Video data | 16 | HDMI_D13 | Video data |
| 17 | GND | Ground | 18 | GND | Ground |
| 19 | HDMI_D4 | Video data | 20 | HDMI_D14 | Video data |
| 21 | HDMI_D3 | Video data | 22 | HDMI_D15 | Video data |
| 23 | GND | Ground | 24 | GND | Ground |
| 25 | HDMI_D2 | Video data | 26 | SDA | $I^2$C control |
| 27 | HDMI_D1 | Video data | 28 | SCL | $I^2$C control |
| 29 | GND | Ground | 30 | GND | Ground |
| 31 | HDMI_D0 | Video data | 32 | N.C. | No connect |
| 33 | DE | Digital video Data Enable signal | 34 | INT | Interrupt signal |
| 35 | GND | Ground | 36 | GND | Ground |
| 37 | HSYNC | Horizontal sync | 38 | SPDIF_CLK | SPDIF reference clock |
| 39 | VSYNC | Vertical sync | 40 | SPDIF | SPDIF audio |

# AUDIO1 (HDMI Output Connector)

*Table 3: AUDIO1 Pin Assignments*

| Pin Number | Signal Name | U1 Pin Name | Description |
|---|---|---|---|
| 1 | TMDS_DAT2p | TX2+ | Differential TMDS output channel 2 |
| 2 | GND | – | Ground |
| 3 | TMDS_DAT2n | TX2- | Differential TMDS output channel 2 |
| 4 | TMDS_DAT1p | TX1+ | Differential TMDS output channel 1 |
| 5 | GND | – | Ground |
| 6 | TMDS_DAT1n | TX1- | Differential TMDS output channel 1 |
| 7 | TMDS_DAT0p | TX0+ | Differential TMDS output channel 0 |
| 8 | GND | – | Ground |
| 9 | TMDS_DAT0n | TX0- | Differential TMDS output channel 0 |
| 10 | TMDS_CLKp | TXC+ | Differential TMDS clock output |
| 11 | GND | – | Ground |
| 12 | TMDS_CLKn | TXC- | Differential TMDS clock output |
| 13 | N.C. | – | No connect |
| 14 | HEACp | HEAC+ | Differential ARC |
| 15 | DDCSCL | DDCSCL | Serial port data clock input |
| 16 | DDCSDA | DDCSDA | Serial port data I/O to sink |
| 17 | GND | – | Ground |
| 18 | 5V0 | – | 5.0 V supply |
| 19 | HotPlug | HPD | Hot Plug detect signal |

# Revision History

*Table 4: Revision History*

| Date | Version | Description |
|---|---|---|
| November 2022 | 1.1 | Corrected part number. |
| November 2022 | 1.0 | Initial release. |