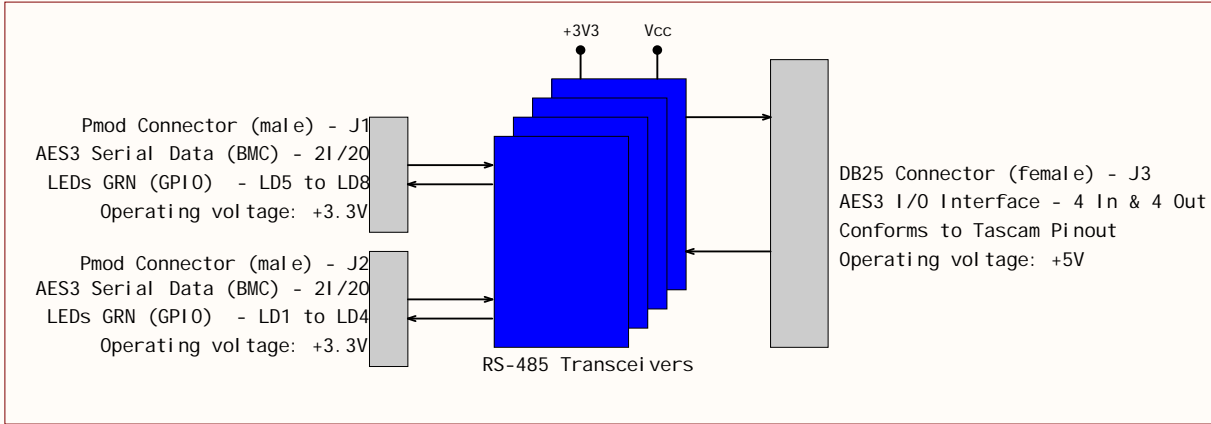
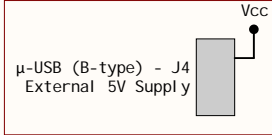


A

AESEBU4x4_DB25F
AESEBU4x4.SchDoc



Power
Power.SchDoc



B

C

iA-Pmod-AES3-4x4 Overview

The iA-Pmod-AES3-4x4 is a double-wide peripheral module conforming to Digilent Pmod™ Interface Specification 1.2.0.

Based around four RS-485 transceivers from Analog Devices (ADM3068EARZ), the iA-Pmod-AES3-4x4 provides 4 inputs and 4 outputs conforming to the AES3 specification on a single DB25 connector. This gives a total of 4 stereo inputs and 4 stereo outputs capable of operating at standard audio rates up to 24-bit 192-kHz.

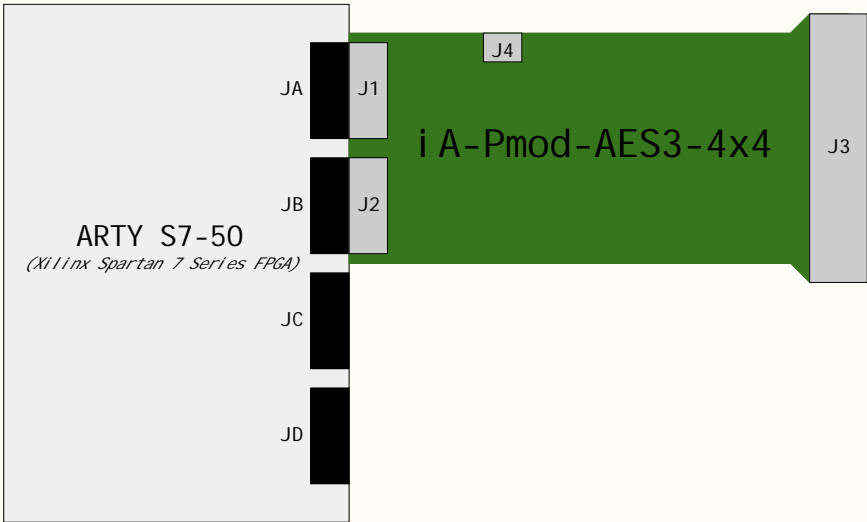
8 general purpose LEDs are included for displaying I/O status and testing.

Given that the typical AES3 signal amplitude is approximately 4 volts, a 5-volt supply is required to power Vcc. This is done through the μ-USB connector (J4). All level shifting between the 3.3V Pmod connectors (J1 & J2) and the 5V AES3 DB25 connector (J3) is done by the ADM3068EARZ ICs.

The J3 connector conforms to the TASCAM pinout for AES3 DB25 connectors. As such, it can be directly connected to any equipment that matches this pinout using appropriate cabling. Alternatively, the individual AES3 I/O can be broken out using a suitable snake (such as the following one from D'Addario).

<https://www.daddario.com/products/accessories/cables/modular-snake/modular-snake-breakout-cables/>

The iA-Pmod-AES3-4x4 has been designed targeting the Arty S7-50, and should be connected to the two high-speed Pmod ports JA & JB (as illustrated). That said, it should be compatible with any development board that has a pair of Pmod connectors and is capable of handling the raw AES3 streams (such as the Avenet MiniZed).



Project Description: 4-In/4-Out AES3 Peripheral Module			imaginary Audio 6903 101 Ave NW Edmonton AB T6A 0H6 <i>imaginary</i> AUDIO
Size: A4	Product Number: iA-Pmod-AES3-4x4		
Designer: Gabriel Bessette		Revision:0.1	
Date: 2020-11-20	Time: 6:58:02 AM	Sheet 1 of 4	
Document:*			Document Rev:0.1

A

B

C

D

A

B

C

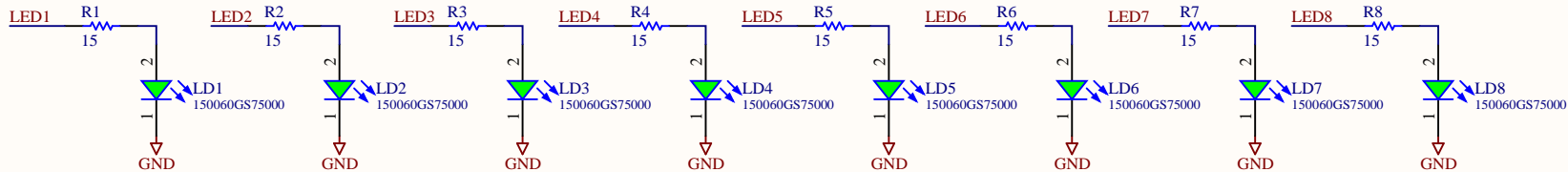
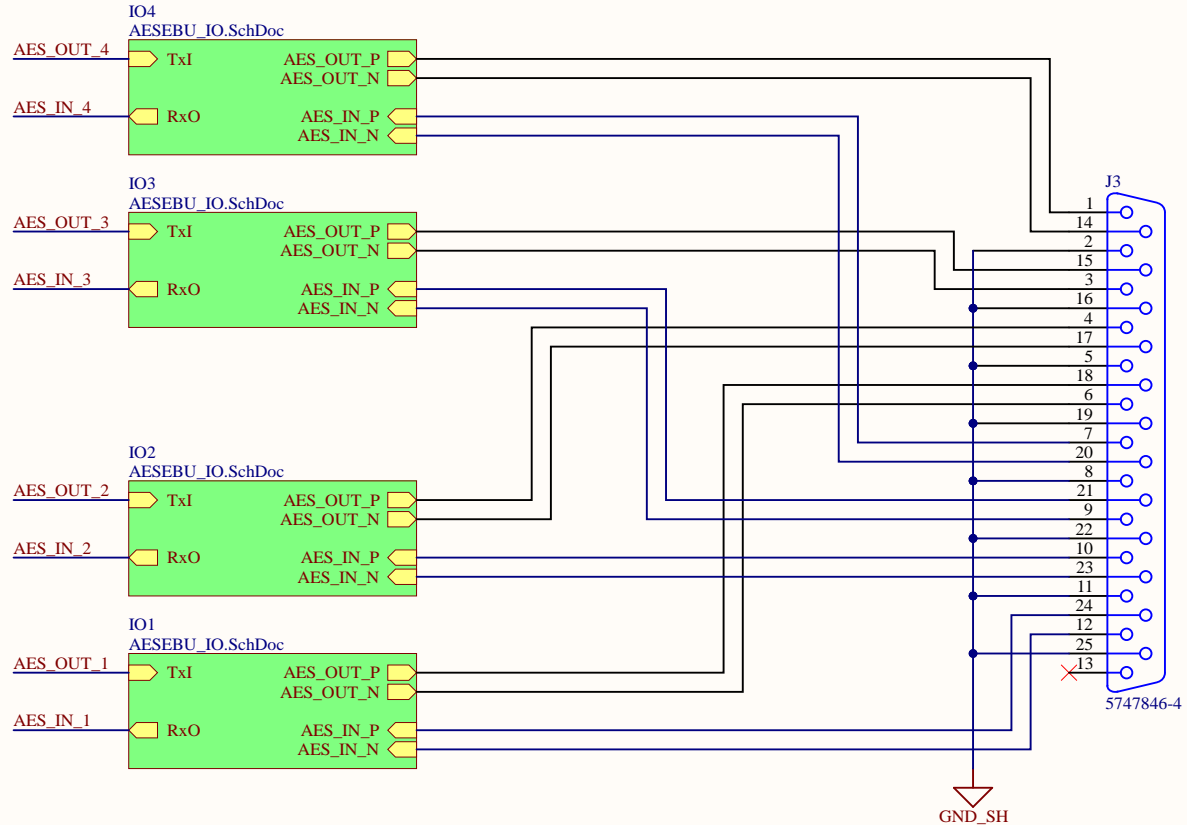
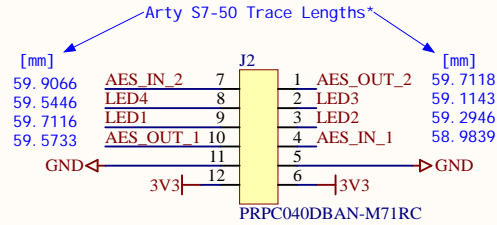
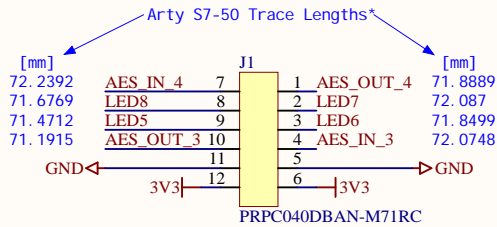
D

A

B

C

D



*Does not include pin lengths

Project Description:4-In/4-Out AES3 Peripheral Module			imaginary Audio 6903 101 Ave NW Edmonton AB T6A 0H6	i magi naryAUDI O	
Size: A4	Product Number:iA-Pmod-AES3-4x4				
Designer:Gabriel Bessette		Revision:0.1		Document:*	Document Rev:0.1
Date: 2020-11-20		Time: 6:58:02 AM			
Sheet2 of 4					

Based on the IBIS model Output impedance of R0 (U1-2) is approximately 21 Ohm (rising) and 24.65 Ohm (falling). Need to verify with SI simulations.

Transformer pins 2 & 5 not internally connected. Connections to respective grounds (GND, & GND_SH) added to increase GND plane areas.

OUT_P and OUT_N are swapped with respect to U1-9 and U1-10 to simplify routing of signals on PCB. This is acceptable as per the AES3 specification.

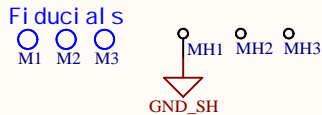
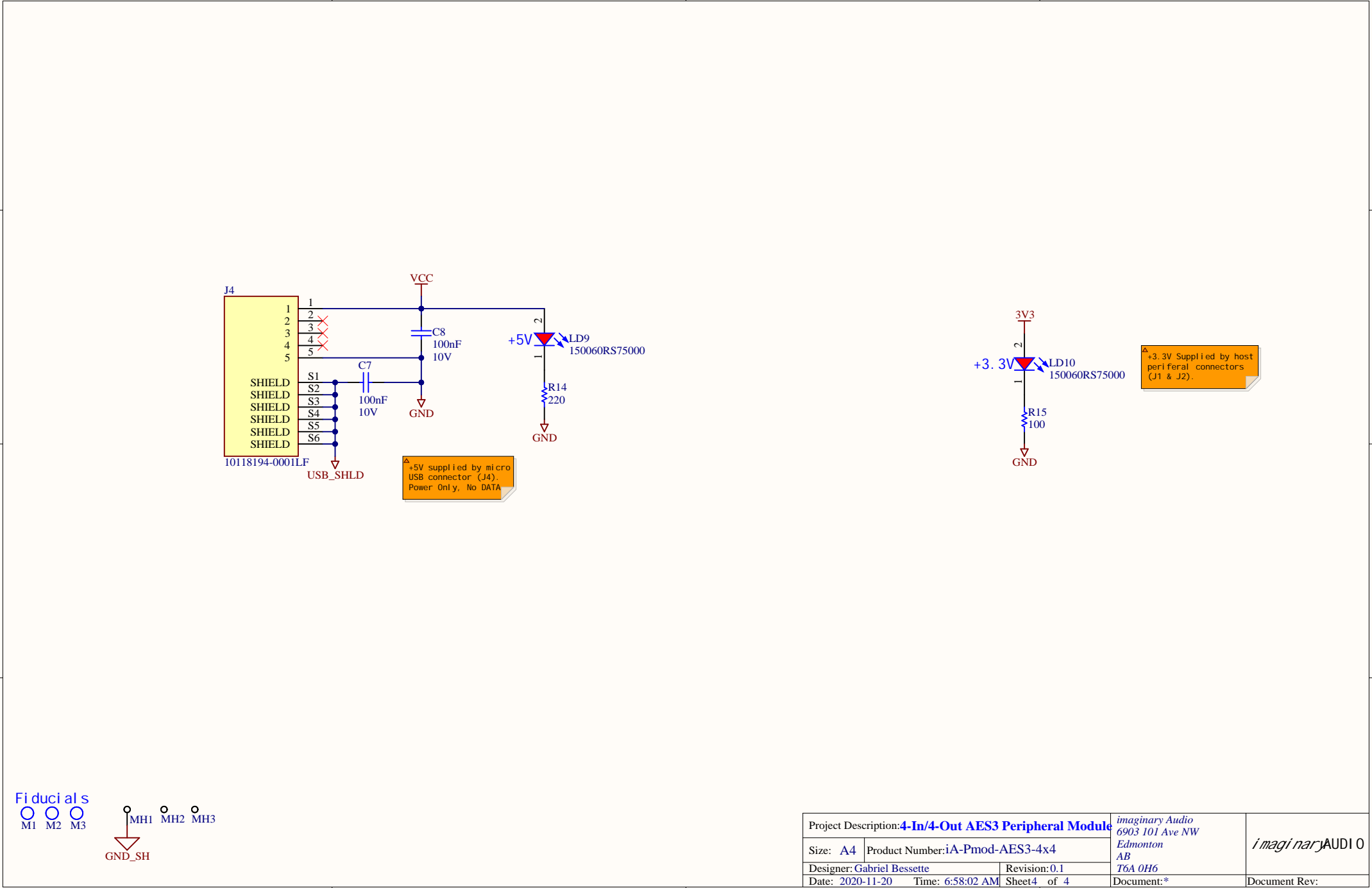
Host outputs AES_OUT_1 [J2-10], AES_OUT_2 [J2-1], AES_OUT_3 [J1-10], AES_OUT_4 [J1-1] (TxI on this sheet) to be configured as LVCMOS33_F_4_HR. This should perform within the AES3 spec for all relevant sample rates (44.1kHz to 192kHz).

Approximate Edge Rates
Rising: 2.99ns to 7.11ns, 4.36ns (typical)
Falling: 2.36ns to 5.27ns, 3.29ns (typical)

TEL/Critical Length (estimate) for 2.3ns falling edge (worst case):
TEL = 321.5mm, Lc_4 = 80.375mm, Lc_2 = 160.75mm
Lc_4_J1 = LengthRouted_S7 - Lc_4 = 8.375mm
Lc_4_J2 = LengthRouted_S7 - Lc_4 = 20.375mm
Lc_2_J1 = LengthRouted_S7 - Lc_2 = 88.75mm
Lc_2_J2 = LengthRouted_S7 - Lc_2 = 100.75mm

Given the trace lengths of the host board and those on the pmod, parallel AC termination (R16 & C6) is included for U1-5.

Project Description:4-In/4-Out AES3 Peripheral Module				imaginary Audio 6903 101 Ave NW Edmonton AB T6A 0H6	i m a g i n a r yAUDI O
Size: A4	Product Number:iA-Pmod-AES3-4x4				
Designer:Gabriel Bessette		Revision:0.1			
Date: 2020-11-20	Time: 6:58:02 AM	Sheet3 of 4			
Document:*					
				Document Rev:	



Project Description: 4-In/4-Out AES3 Peripheral Module			<i>imaginary Audio</i> 6903 101 Ave NW Edmonton AB <i>T6A 0H6</i>	<i>i m a g i n a r y</i> AUDI 0
Size: A4	Product Number: iA-Pmod-AES3-4x4			
Designer: Gabriel Bessette	Revision: 0.1			
Date: 2020-11-20	Time: 6:58:02 AM	Sheet 4 of 4	Document: *	
				Document Rev:

