

# **Audial**

# S5

PCM / I2S DIRECT  
SPECIFICATIONS

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[www.audialonline.com](http://www.audialonline.com)

Audial S5 D/A converter employs serial PCM interface as external digital audio connection, with HDMI connector. The interface can carry either I2S or 16-bit simultaneous data protocol, both originally defined by Philips.

This document specifies electrical properties of this connection. Other manufacturers are free and welcome to adopt the same.

## ELECTRICAL SPECIFICATIONS

The interface uses a standard HDMI (A) connector, with the following pinout.

Pin	I2S	Philips sim. data
1	DATA	DATA L
2	GND	GND
3	N/C	N/C
4	BCK	BCK
5	GND	GND
6	N/C	N/C
7	WS	LE
8	GND	GND
9	N/C	N/C
10	N/C	DATA R
11	N/C	GND
12	N/C	N/C
13	N/C	N/C
14	N/C	N/C
15	N/C	N/C
16	N/C	N/C
17	GND	GND
18	N/C	N/C
19	GND	GND

The shown pinout applies to the receiving device. At the source, pins 3, 6, and 9 (and pin 12 in the case of Philips simultaneous protocol) can be grounded.

The interface operates at TTL / CMOS voltages.

The receiving device is 3.3 V nominal, up to 5 V tolerant, with the absolute maximum rated to 7 V (intermittent, and not supported for long term use). Low-level maximum voltage is 1 V, a high-level minimum voltage is 2.3 V. The input is not terminated and acts as a high impedance load.

The source output high-level is 3 V (typically). In the S5, it includes a 100 Ohm resistor at each signal, which protects it from short.

This also matches the proposed impedance of the HDMI cable, however the impedance matching between the source, the interface, and the receiver is not critical, and hence it is not proposed to be matched at this time.

The HDMI cable used here should be as short as possible, preferably not longer than 50 cm, with the lowest possible resistance of ground conductors. Capacitance should be also as low as possible, preferably below 50 pF from pins 1, 4, 7, and 10 to the ground. The capacitance above 150 pF may cut into the required bandwidth.

In the S5 DAC, all the ground pins, at both sides of this connection, are connected directly to their respective stages ground planes.

