EVAL-1CH2CHSOIC User Guide

Using the EVAL-1CH2CHSOIC *i*Coupler Data Isolator Evaluation Board

FEATURES

Access to all 2 data channels Multiple connection options
Provision for cableterminations

Support for printed circuit board (PCB) edge mounted coaxial connectors Easy configuration

Sample iCoupler digital isolator must be ordered separately

SUPPORT iCoupler GENERICS

π120Ax/π121Ax
π120Mx/π121Mx
π120Ux/π121Ux
π110Ax
π110Mx

EVALUATION BOARD PHOTOGRAPH

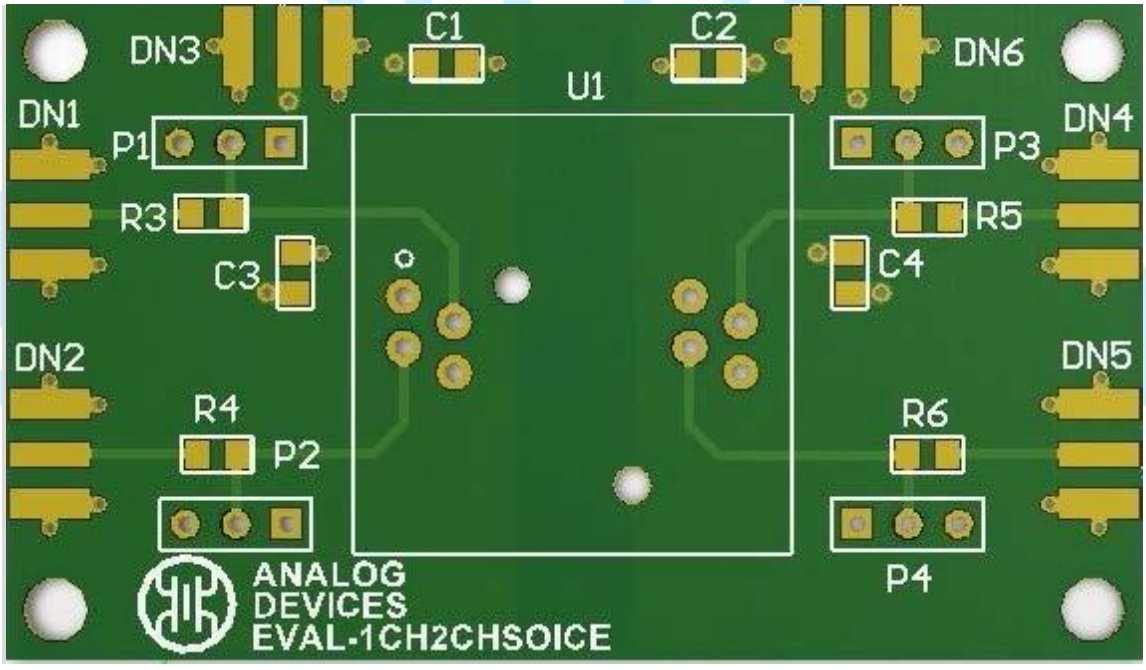

Figure1 PCB Photograph

GENERAL DESCRIPTION

The **EVAL-1CH2CHSOIC** evaluation board supports two-channel standard data isolators in 8-lead SOIC packages. The evaluation board provides a JEDEC standard 8-lead SOIC_N and SOIC_W pad layout and routing appropriate for the evaluation of supported devices. The evaluation board provides a connection to power supplies by screw terminals and includes optimal bypass capacitors.

Signal channel routing supports signal distribution and loopback, and provides positions for loads referenced to the VDD1/VDD2 and GND1/GND2 planes. Signal sources can be conducted to the board through header pins or edge mounted SMA connectors; SMA connectors must be ordered separately.

The board follows PCB design practices for 4-layer boards, including a full power and ground plane on each side of the isolation barrier. No other electromagnetic interference (EMI) or noise mitigation design features are included on the board. In cases of very high speed operation or when ultralow emissions are required

Full specifications for the device under test (DUT) are available in the corresponding product data sheet, which should be consulted in conjunction with this user guide when using the evaluation board.

EVALUATION BOARD CIRCUITRY

PCB EVALUATION FUNCTIONS

The **EVAL-1CH2CHSOIC** board evaluates the full range of iCoupler® data transfer functions, powers each side of the iCoupler isolator independently, and applies high differential voltages between the two sides of the isolator. The board is intended for evaluation of the components, but has not been safety certified for high voltage operation. If differential voltages greater than 60 V are applied, external safety measures appropriate for the voltage must be in place.

The evaluation board comes with power terminals, bypass capacitors, and header pins installed. The compatible iCoupler digital isolator must be ordered and installed separately. The **EVAL-1CH2CHSOIC** is compatible with two channel iCoupler standard data isolator devices with on-off keying architecture, such as the **π120A/π121A/π120B/π121B/π120T/π121T/π120M/π121M/π120U/π121U** in 8-lead SOIC_W and 8-lead SOIC_N packages.

CONNECTORS

The PCB provides support for three types of interconnections: SMA edge mounted connectors

Through hole signal ground pairs
Terminal blocks for power connections

With these three options, it is possible to make temporary and permanent connections to the board.

When coaxial connections are required, SMA connector positions are available for digital input and output signals and VDD1 and VDD2 power supplies. The SMA connector positions must be ordered from a distributor separately. Figure 2 shows examples of installed SMA connectors; these connectors are not only low profile and provide excellent mechanical connections to the PCB, but also support 50 Ω coaxial cabling

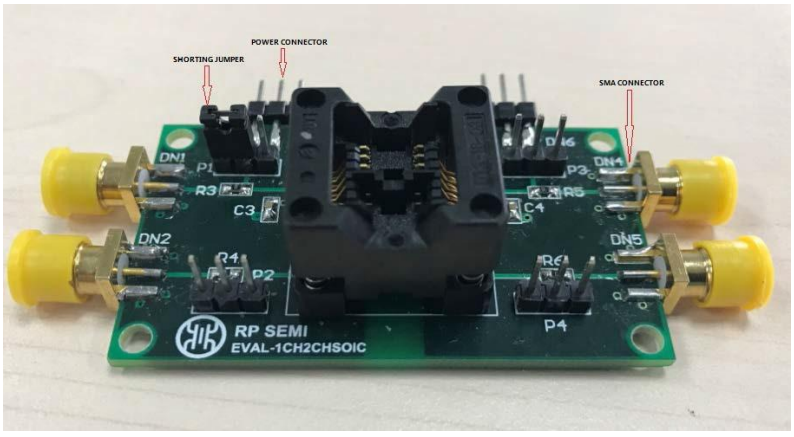

Figure 2 OptionalComponents

Power can be connected through the DN3 and DN6 (The middle Terminal is the power in Figure 1) terminal blocks or the optional VDD1 and VDD2 SMA connectors. Signals can be routed in or out of the board with the provided header pins or optional SMA connectors. The pin spacing of each through hole connector is 0.1 inch between centers

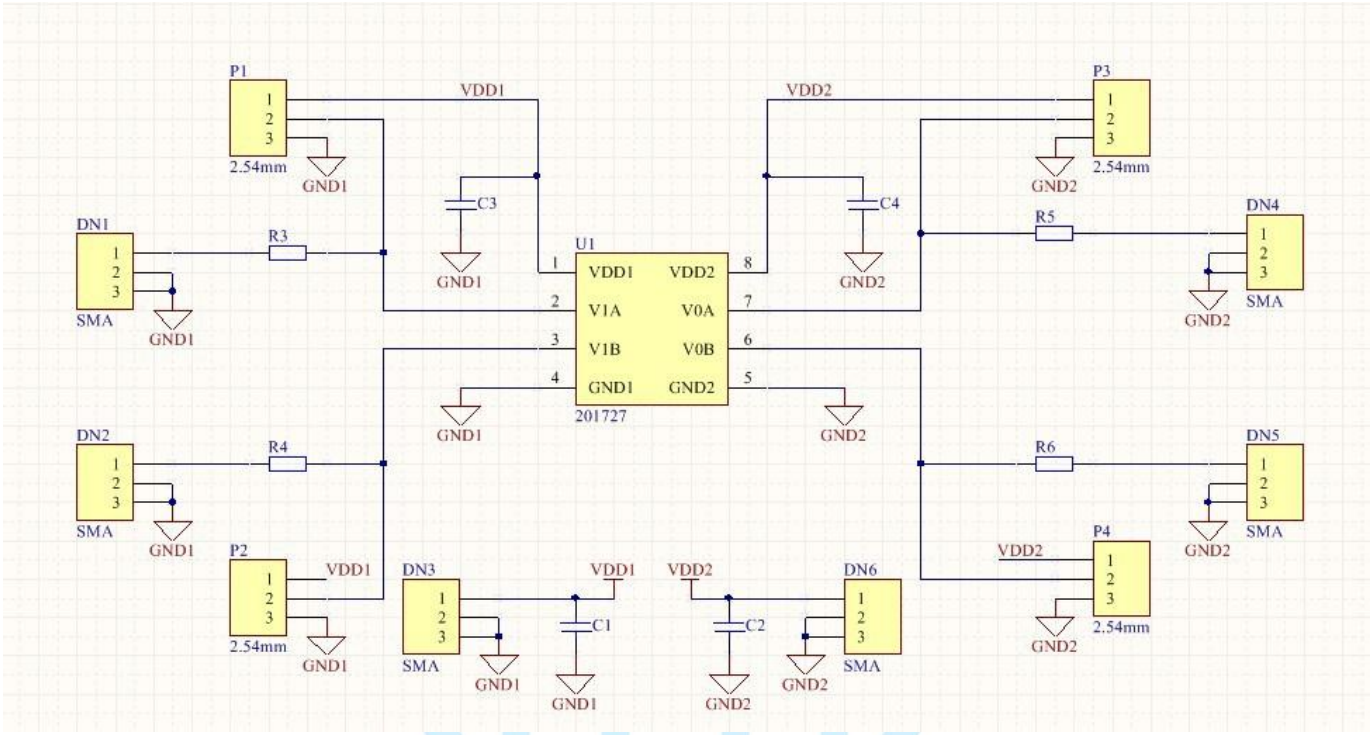

Figure 3 EVAL-1CH2CHSOIC Evaluation Board Schematic

POWER INPUT

Each side of the iCoupler standard data isolator requires an off-board power source. The power source must be independent if common-mode voltages are applied across the isolation barrier, or damage may occur to the power supply.

Divided power and ground planes are present on Layer 2 and Layer 3 of the PCB on each side of the isolation barrier. Power connects to VDD1 for Side 1 and to VDD2 for Side 2.

DATA INPUT/OUTPUT STRUCTURES

Each data channel has similar connections available.

Starting at the external connection, the signal path is constructed as follows, corresponding with Label in Figure 3:

- A pad layout for a PCB board, edge-mounted SMA connector.
- A standard 0805 pad layout where the coaxial and termination structures can connect to the rest of the signal path.
- A populated 2-pin header provides a signal ground pair that can be used for clip leads or shorting a channel to ground temporarily.
- There are groupings of three open through holes, consisting of a signal and two ground connections. Use these holes for hardwiring signal wires into the PCB, installing a 2-pin header to allow adjacent channels to temporarily be shorted together.
- A 0805 pad layout between the signal and ground where a load capacitor or resistor can be installed.

Figure 2 shows many of the optional components installed as well as how jumpers can temporarily connect channels.

BYPASS ON THE PCB

Optional surface-mount bulk capacitors, C1 and C2, are installed near the power connectors to compensate for long cables to the power supply. Bypass capacitors, C3 and C4, are installed near the iCoupler isolator and consist of a 0.1 µF capacitor for both DUT power supply pins.

HIGH VOLTAGE CAPABILITY

The PCB is designed in adherence with 2500 V basic insulation practices. High voltage testing beyond 2500 V is not recommended. Do not rely on the evaluation board for safety functions.

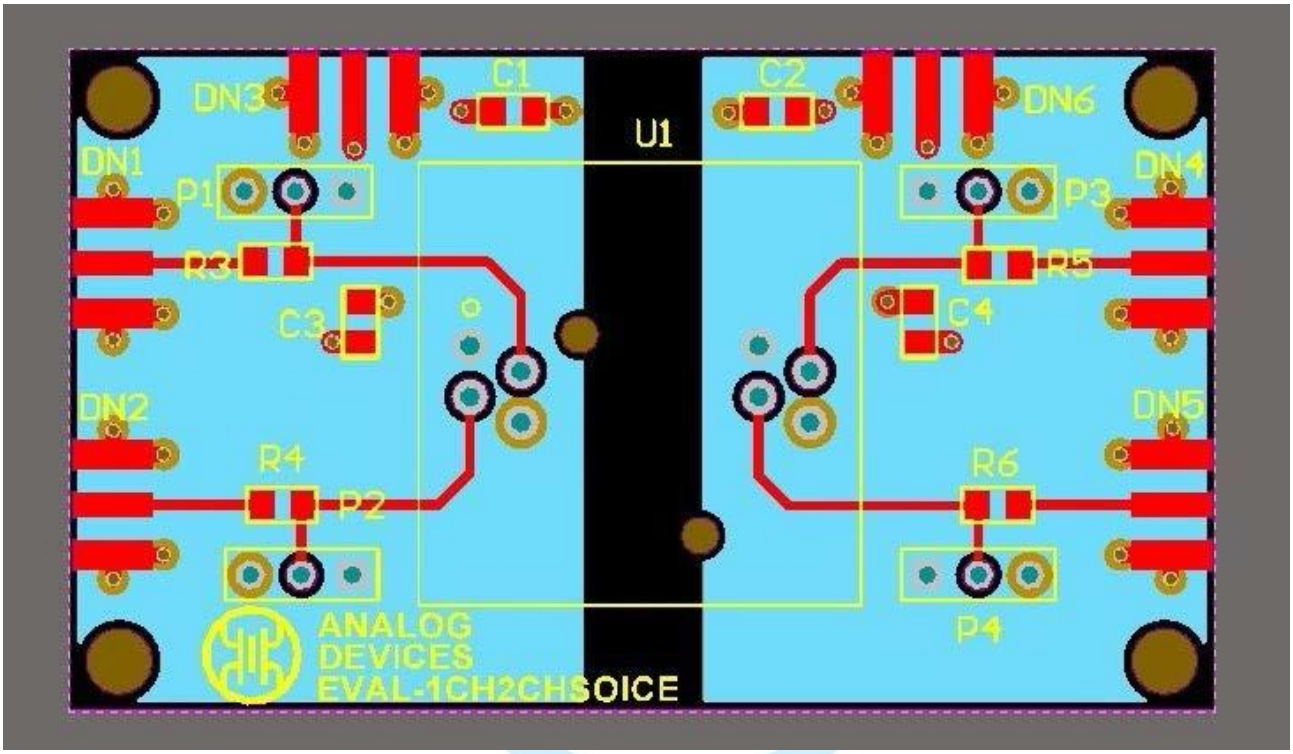

Figure 4 Top Level Signal Routing and Assembly

ORDERING INFORMATION

BILL OF MATERIALS

Qty	Reference Designator	Description	Part Number/Manufacturer
1	U1	Two-channel digital isolator (not installed)	2π Semi Co,.Ltd/π120A/B/M/T/U-1
2	C1, C2	0805, 10 µF, ceramic capacitors	Not applicable
2	C3, C4	0805, 0.1 µF, bypass capacitors	Not applicable
4	P1, P2, P3, P4	3-pin headers, 0.1 inch spacing	Not applicable
4	DN1, DN2, DN4, DN5	SMA edge connectors	Johnson/142-0701-851
4	R3, R4, R5, R6	0603, 0 Ω, SMA connection resistors	Not applicable