ISL5519xEVAL1Z Evaluation Board User's Guide

Application Note | August 21, 2007 | AN1347.0

Introduction

The ISL5519xEVAL1Z evaluation board is a design platform containing all the circuitry needed to characterize critical performance parameters of the ISL55190 and ISL55191 single op amps, using a variety of user defined test circuits.

The ISL5519x amplifiers are single high speed operational amplifiers featuring low noise, low distortion, and rail-to-rail output drive capability. They are designed to operate with single and single supplies from +5VDC (±2.5VDC) down to +3VDC (±1.5VDC).

Reference Documents

- ISL55190 Data Sheet, FN6262
- ISL55191 Data Sheet, FN6263

Evaluation Board Key Features

The ISL5519xEVAL1Z is designed to enable the IC to operate from a single supply (+3VDC to +5VDC), or from split supplies (±1.5VDC to ±2.5V). The board is configured for differential input with a closed loop gain of 10.

Power Supplies *(Figure 1)*

External power connections are made through the V+, V- and Ground connections on the evaluation board. For single supply operation, the V- and GND pins are tied together to the power supply negative terminal. For split supplies V+ and V- terminals connect to their respective power supply terminals. De-coupling capacitors C_4, C_9, connect to ground through R_{17}, R_{18}, 0Ω resistors. Two additional capacitors, C_6 and C_8 are placed close to the IC and provide additional high frequency filtering. Anti-reverse diodes D_1 and D_2 protect the circuit in the case of accidental polarity reversal.

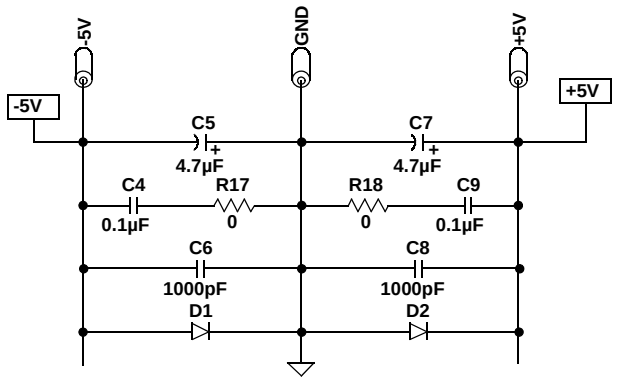


FIGURE 1. POWER SUPPLY CIRCUIT

Amplifier Configuration *(Figure 2)*

The schematic of op amp with the components supplied is shown in Figure 2. The circuit implements a differential input amp with a closed loop gain of 10. A series 50Ω back-termination is included for driving 50Ω cables. The circuit can operate from a single 3VDC to +5VDC supply, or from dual supplies from ±1.5VDC to ±2.5VDC.

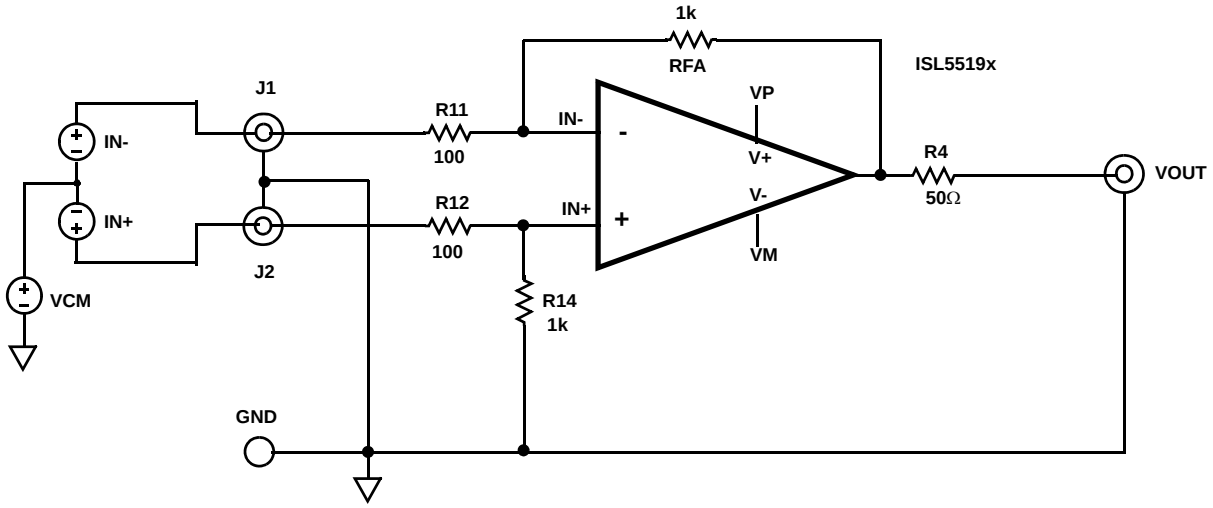


FIGURE 2. BASIC AMPLIFIER CONFIGURATION

User-Selectable Options *(Figures 3 and 4)*

Component pads are included to enable a variety of user-selectable circuits to be added to the amplifier inputs, outputs and the amplifier feedback loops. The output (Figure 3) has additional resistor and capacitance placements for loading, and the inverting and non-inverting inputs (Figure 4) have additional resistor placements and auxiliary BNC connectors for added flexibility. The ISL5519x op amps are high bandwidth amplifiers and sensitive to input/output parasitics. It is therefore crucial to use appropriate cabling when working with these devices.

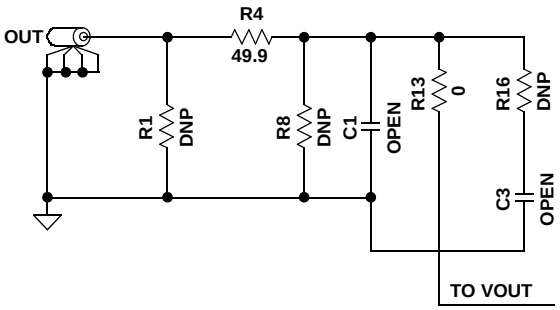


FIGURE 3. OUTPUT STAGE

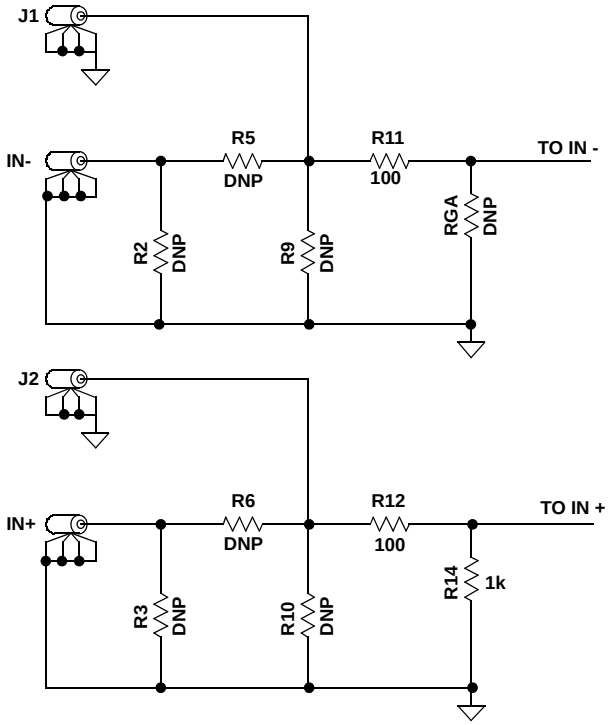
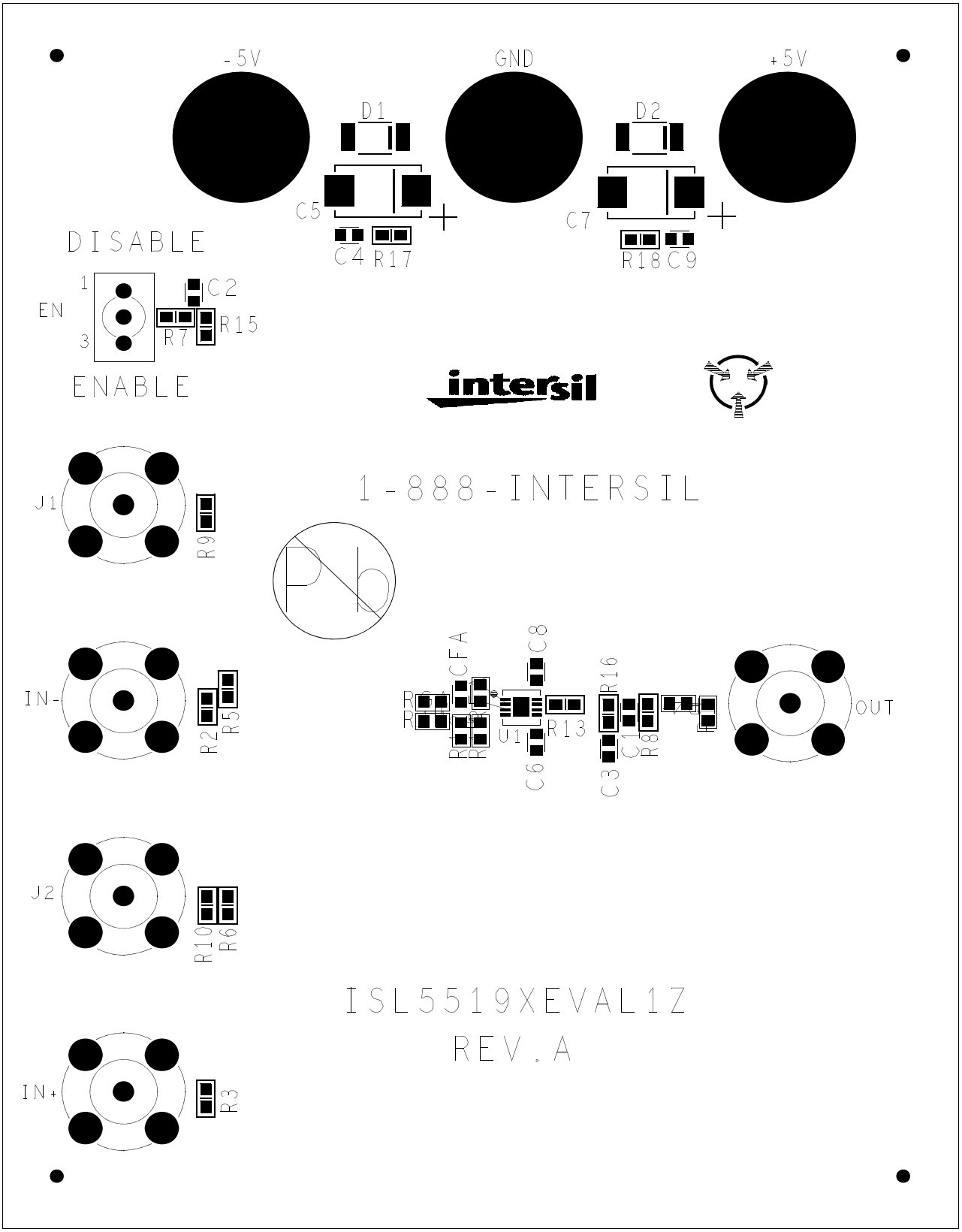


FIGURE 4. INPUT STAGE

ISL5519xEVAL1Z Components Parts List

DEVICE NUMBER	DESCRIPTION	COMMENTS
C5, C7	CAP-TANTALUM, SMD, D, 4.7µF, 50V, 10%, LOW ESR, ROHS	Power supply decoupling
C4, C9	CAP, SMD, 0603, 0.1µF, 25V, 10%, X7R, ROHS	Power supply decoupling
C6, C8	CAP, SMD, 0603,1000pF, 25V, 10%, X7R, ROHS	User selectable capacitors - not populated
C1-C3, CFA	CAP, SMD, 0603, DNP-PLACE HOLDER, ROHS	User selectable capacitors - not populated
D1, D2	DIODE-RECTIFIER, SMD, SOD-123, 2P, 40V, 0.5A, ROHS	Reverse power protection
U1 (ISL55190EVAL1Z)	ISL55190FUZ, IC-RAIL-TO-RAIL OP AMP, 10P, MSOP, ROHS	
U1 (ISL55191EVAL1Z)	ISL55191FUZ, IC-RAIL-TO-RAIL OP AMP, 10P, MSOP, ROHS	
R1-R3, R5, R6, R8-R10, R15, R16, RGA	RESISTOR, SMD, 0603, 0.1%, MF, DNP-PLACE HOLDER	User selectable resistors - not populated
R13, R17, R18	RES, SMD, 0603, 0Ω, 1/16W, TF, ROHS	0Ω user selectable resistors
R4	RES, SMD, 0603, 49.9Ω, 1/10W, 1%, TF, ROHS	Output series resistors
R7	RES, SMD, 0603, 10k, 1/10W, 1%, TF, ROHS	Enable pull-up resistors
R14, RFA	RES, SMD, 0603, 1.00k, 1/10W, 1%, TF, ROHS	Gain resistors
R11, R12	RES, SMD, 0805, 100Ω, 1/8W, TF, ROHS	Gain resistors

ISL5519xEVAL1Z Top View



ISL5519xEVAL1Z Schematic Diagram