

## Introduction

The ISL2819xEVAL1Z evaluation board is a design platform containing all the circuitry needed to characterize critical performance parameters of the ISL28190 and ISL28191 single operational amplifiers, using a variety of user defined test circuits.

The ISL28190 and ISL28191 amplifiers feature ultra-low noise, ultra-low distortion, and rail-to-rail output drive capability. They are designed to operate with single and dual supplies from +5.5VDC ( $\pm 2.75$ VDC) down to +3VDC ( $\pm 1.5$ VDC).

## Reference Documents

- ISL28190 Data Sheet, FN6247
- ISL28191 Data Sheet, FN6156

## Evaluation Board Key Features

The ISL2819xEVAL1Z is designed to enable the IC to operate from a single supply (+3VDC to +5.5VDC), or from split supplies ( $\pm 1.5$ VDC to  $\pm 2.75$ V). The board is configured for a single op amps connected for differential input with a closed loop gain of 10. A single external reference voltage (VREF) pin and provisions for a user-selectable voltage divider (filter is included).

## 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 Ground 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<sub>1</sub> and C<sub>2</sub> connect to ground through R<sub>1</sub> and R<sub>21</sub> 0 $\Omega$  resistors. Resistors R<sub>20</sub> and

R<sub>24</sub> are 0 $\Omega$  but can be changed by the user to provide additional power supply filtering, or to reduce the voltage rate-of-rise to less than  $\pm 1$ V/ $\mu$ s. Two additional capacitors, C<sub>3</sub> and C<sub>4</sub> are connected close to the part to filter out high frequency noise. Anti-reverse diodes D<sub>1</sub> and D<sub>2</sub> protect the circuit in the case of accidental polarity reversal.

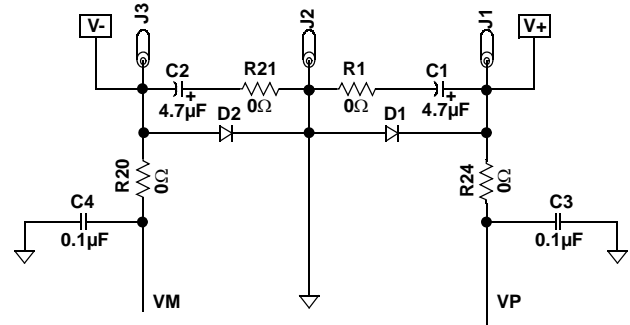


FIGURE 1. POWER SUPPLY CIRCUIT

## Amplifier Configuration (Figure 2)

The schematic of the 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. The circuit can operate from a single 3VDC to +5.5VDC supply, or from dual supplies from  $\pm 1.5$ VDC to  $\pm 2.75$ VDC. The VREF pin can be connected to ground to establish a ground referenced input for split supply operation, or can be externally set to any reference level for single supply operation.

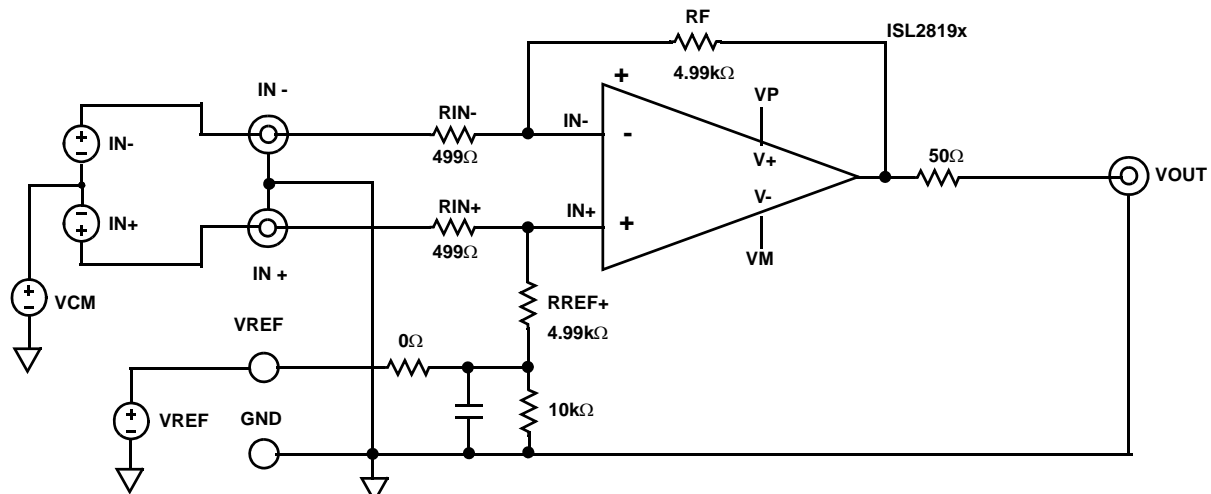


FIGURE 2. BASIC AMPLIFIER CONFIGURATION

**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, the VREF input, outputs and the amplifier feedback loops.

A voltage divider and filter option (Figure 3) can be added to establish a power supply-tracking common mode reference at the VREF input. The inverting and non-inverting inputs

have additional resistor placements for adding input attenuation, or to establish input DC offsets through the VREF pin.

The output (Figure 4) has a series 50Ω back-termination resistor to drive 50Ω cables, and additional resistor and capacitor placements for loading.

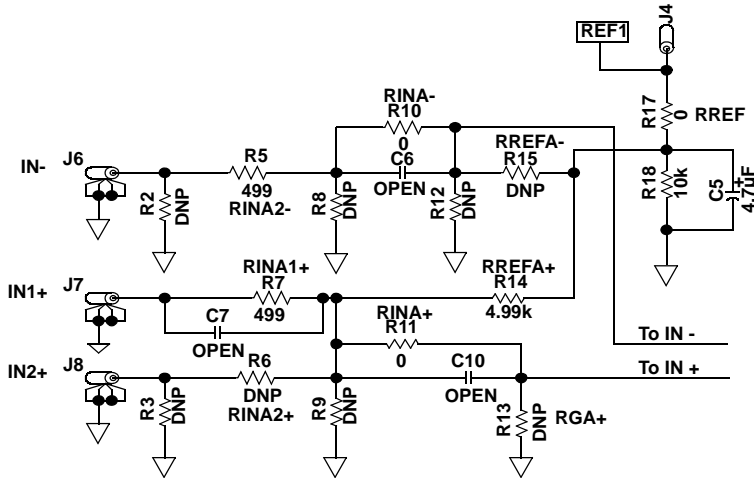


FIGURE 3. INPUT STAGE

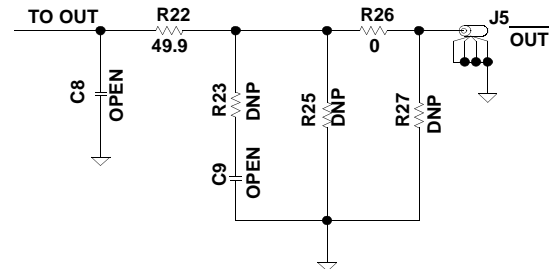
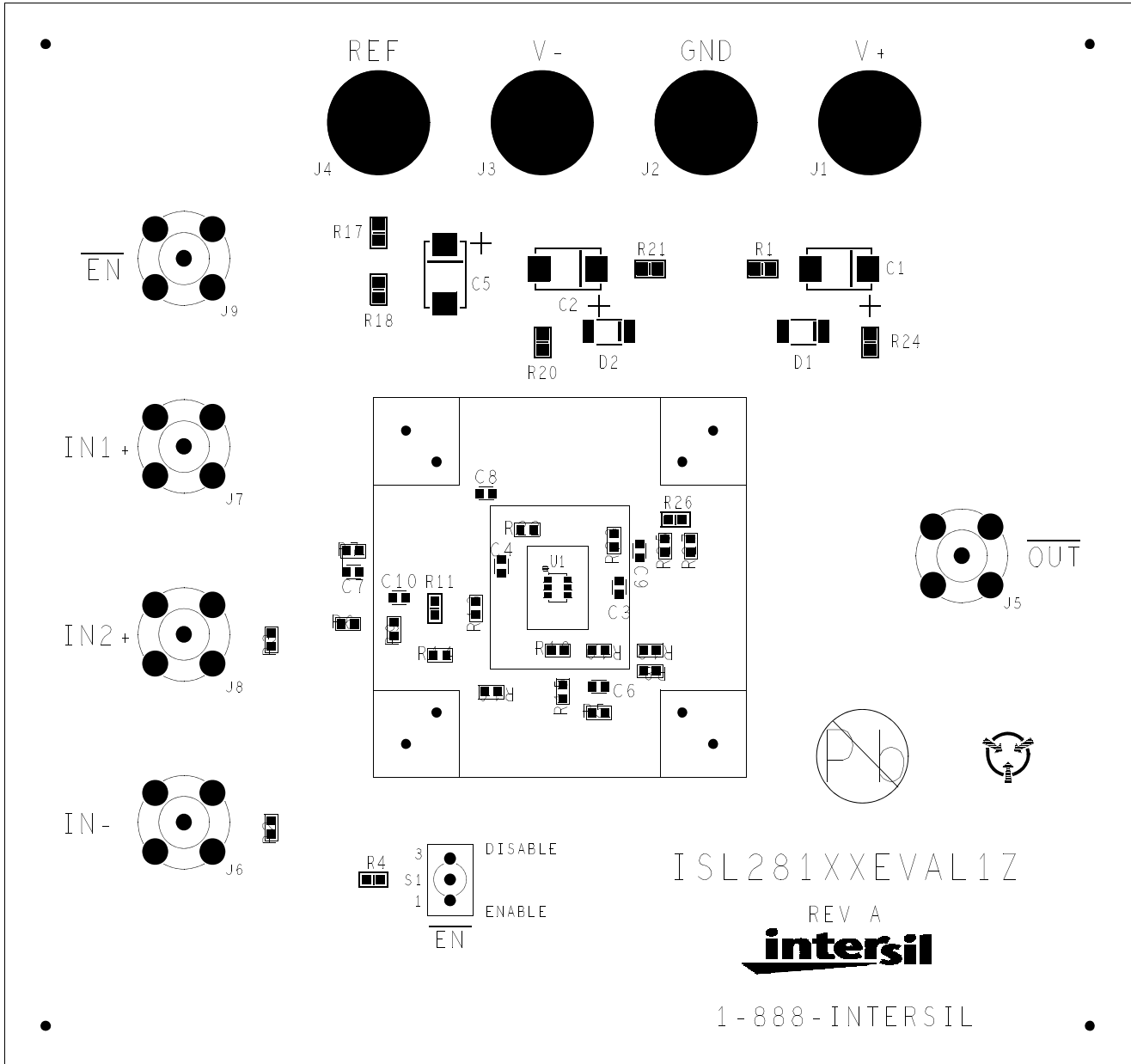


FIGURE 4. OUTPUT STAGE

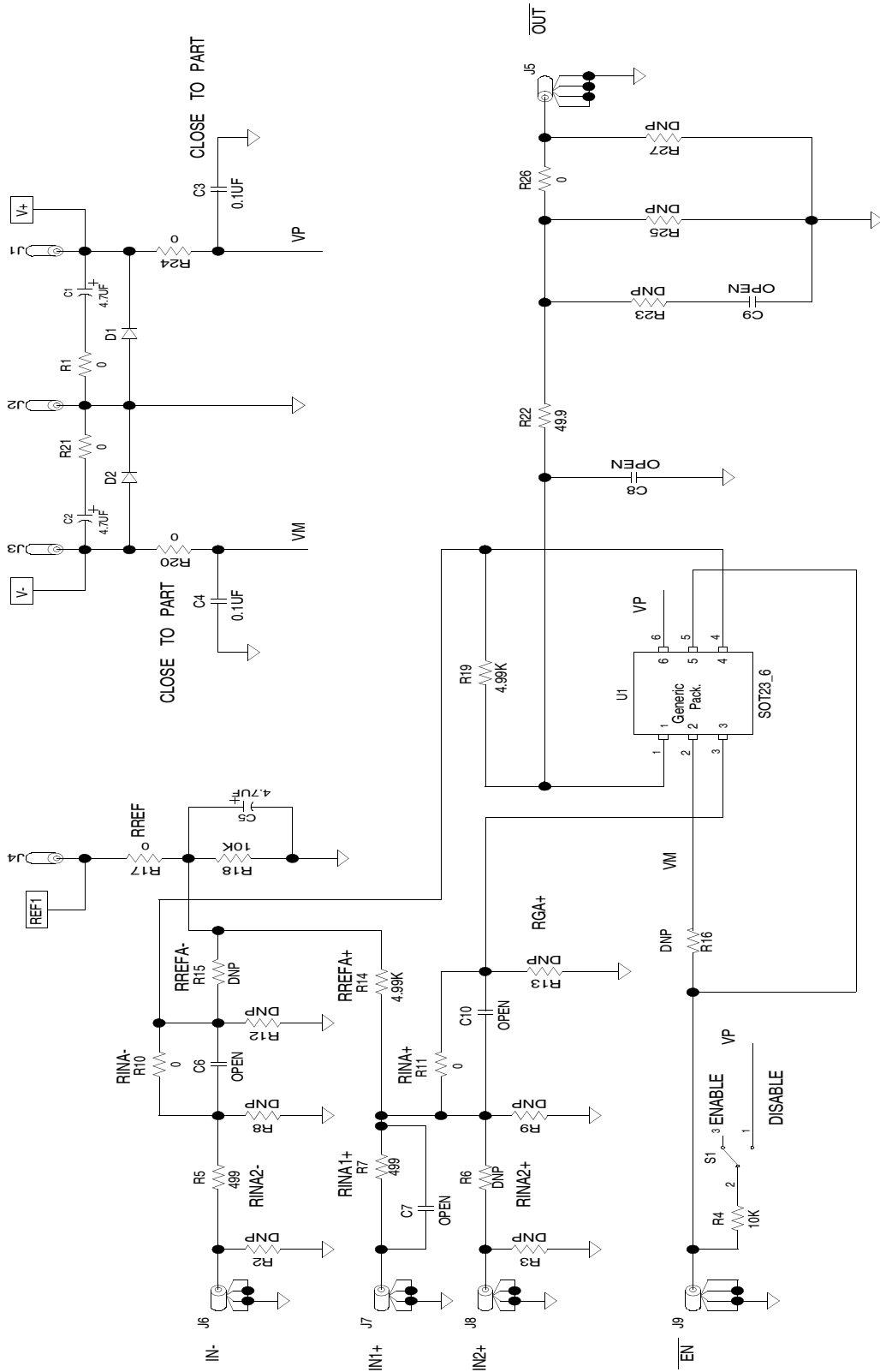
**ISL2819xEVAL1Z Components Parts List**

DEVICE NUMBER	DESCRIPTION	COMMENTS
C1, C2, C5	CAP-TANTALUM, SMD, D, 4.7μF, 50V, 10%, LOW ESR, ROHS	Power supply decoupling
C3, C4	CAP, SMD, 0603, 0.1μF, 25V, 10%, X7R, ROHS	Power supply decoupling
C6-C10	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 (ISL28190EVAL1Z)	ISL28190FHZ-T7, IC-RAIL-TO-RAIL OP AMP, SOT-23, ROHS	
U1 (ISL28191EVAL1Z)	ISL28191FHZ-T7, IC-RAIL-TO-RAIL OP AMP, SOT-23, ROHS	
R2, R3, R6, R8, R9, R12, R13, R15, R16, R23, R25, R27	RESISTOR, SMD, 0603, 0.1%, MF, DNP-PLACE HOLDER	User selectable resistors - not populated
R1, R10, R11, R17, R20, R21, R24, R26	RES, SMD, 0603, 0Ω, 1/10W, TF, ROHS	0Ω user selectable resistors
R22	RES, SMD, 0603, 49.9Ω, 1/10W, 1%, TF, ROHS	User selectable output resistors
R5, R7	RES, SMD, 0603, 499Ω, 1/10W, 1%, TF, ROHS	Gain resistors
R14, R19	RES, SMD, 0603, 4.99k, 1/10W, 1%, TF, ROHS	Gain resistors
R4, R18	RES, SMD, 0603, 10k, 1/10W, 1%, TF, ROHS	User selectable resistors

ISL2819xEVAL1Z Top View



ISL2819xEVAL1Z Schematic Diagram



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