

## Introduction

The ISL284xxEVAL1Z evaluation board is a design platform containing all the circuitry needed to characterize critical performance parameters of the ISL28470 quad instrumentation amplifier using a variety of user defined test circuits.

The ISL284xx are quad operational amplifiers featuring low noise, low distortion, and rail-to-rail output drive capability. They are designed to operate with single and dual supplies from +5VDC ( $\pm 2.5\text{VDC}$ ) down to +2.4VDC ( $\pm 1.2\text{VDC}$ ).

## Reference Documents

- ISL28476 Data Sheet, FN6301
- ISL28478 Data Sheet, FN6339
- ISL28486 Data Sheet, FN6312
- ISL28488 Data Sheet, FN6339

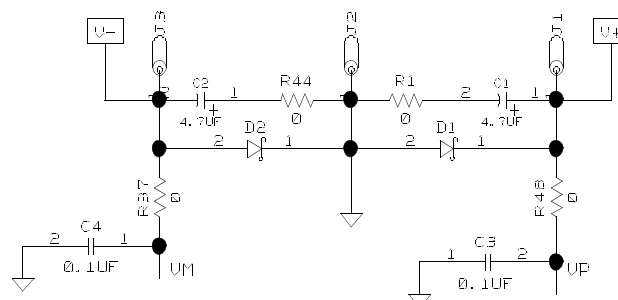
## Evaluation Board Key Features

The ISL284xxEVAL1Z is designed to enable the IC to operate from a single supply (+2.4VDC to +5VDC), or from split supplies ( $\pm 1.2$ VDC to  $\pm 2.5$ V). The board is configured for 4 independent 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<sub>+</sub>, V<sub>-</sub> and GND connections on the evaluation board. For single

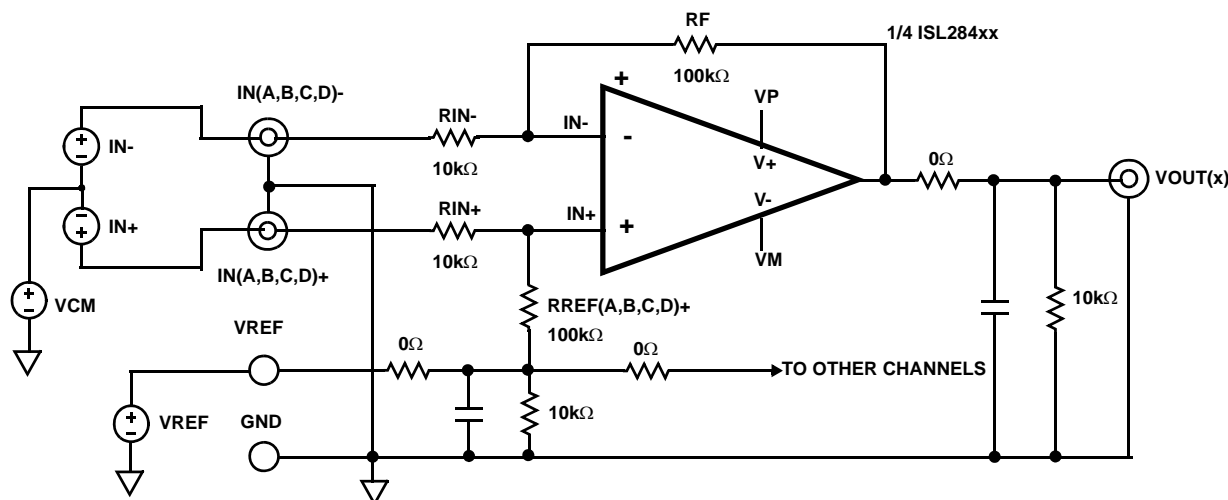
supply operation, the V<sub>+</sub> and GND pins are tied together to the power supply negative terminal. For split supplies +V<sub>+</sub> and V<sub>-</sub> terminals connect to their respective power supply terminals. De-coupling capacitors C<sub>1</sub> and C<sub>2</sub>, connect to GND through R<sub>1</sub> and R<sub>2</sub>, 0Ω resistors. Resistors R<sub>3</sub> and R<sub>4</sub> are 0Ω but can be changed by the user to provide additional power supply filtering, or to reduce the voltage rate-of-rise to less than ±1V/μs. 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 each of the 4 op amps 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 2.4VDC to +5VDC supply, or from dual supplies from  $\pm 1.2$ VDC to  $\pm 2.5$ 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 (Figure 3)

Component pads are included to enable a variety of user-selectable circuits to be added to the amplifier inputs, the VREF input, and the amplifier feedback loops. A voltage divider and filter option 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.

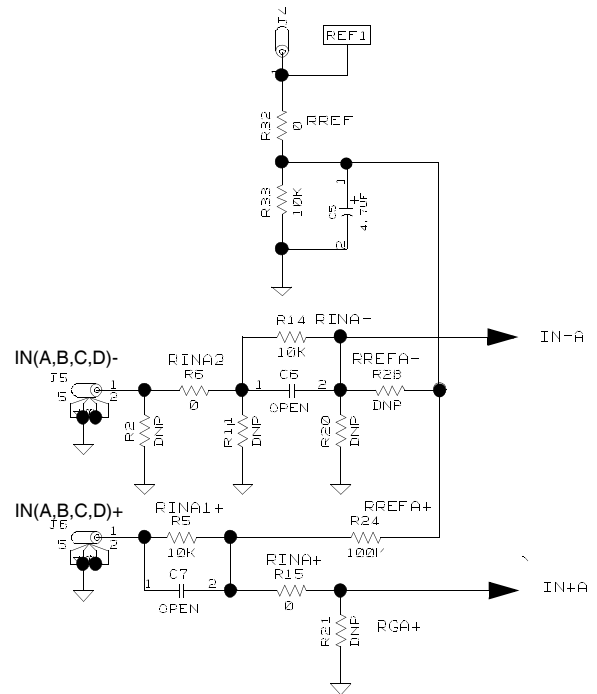
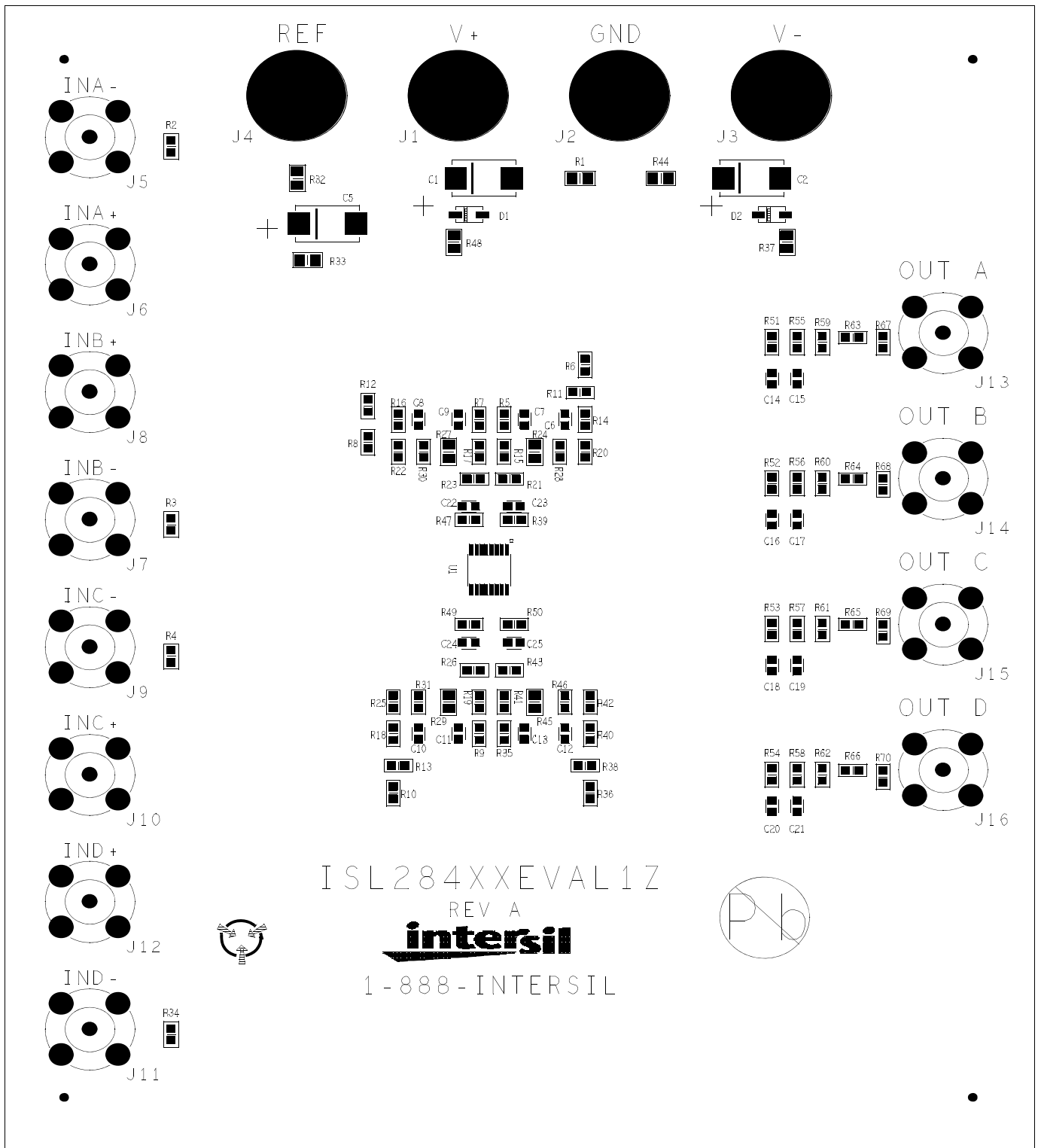


FIGURE 3. COMPONENT-SELECTABLE OPTIONS

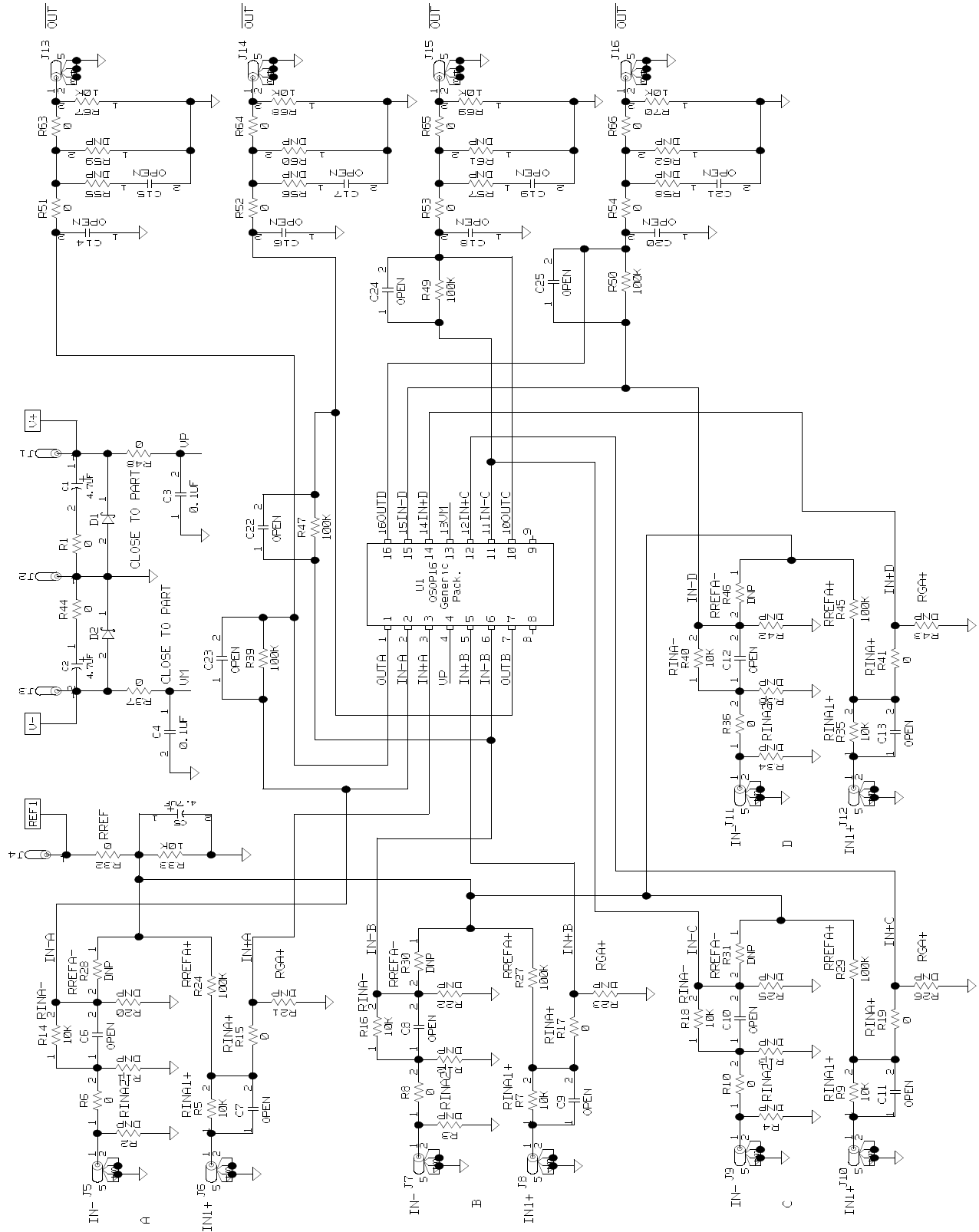
### ISL284xxEVAL1Z Components Parts List

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-C25	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 (ISL28476EVAL1Z)	ISL28476FAZ, IC-RAIL-TO-RAIL PRECISION OP AMP, 16P, QSOP, ROHS	
U1 (ISL28478EVAL1Z)	ISL28478FAZ, IC-RAIL-TO-RAIL PRECISION OP AMP, 16P, QSOP, ROHS	
U1 (ISL28486EVAL1Z)	ISL28486FAZ, IC-RAIL-TO-RAIL PRECISION OP AMP, 16P, QSOP, ROHS	
U1 (ISL28488EVAL1Z)	ISL28488FAZ, IC-RAIL-TO-RAIL PRECISION OP AMP, 16P, QSOP, ROHS	
R2-R4, R11-R13, R20-R23, R25, R26, R28, R30, R31, R34, R38, R42, R43, R46, R55-R58, R59-R62	RESISTOR, SMD, 0603, 0.1%, MF, DNP-PLACE HOLDER	User selectable resistors - not populated
R6, R8, R10, R15, R17, R19, R36, R41, R51-R54, R63-R66	RES, SMD, 0603, 0Ω, 1/16W, TF, ROHS	0Ω user selectable resistors
R5, R7, R9, R14, R16, R18, R33, R35, R40, R67-R70	RES, SMD, 0603, 10k, 1/10W, 1%, TF, ROHS	RG gain resistors
R24, R27, R29, R39, R45, R47, R49, R50	RES, SMD, 0603, 100k, 1/10W, 1%, TF, ROHS	RF gain resistors
R1, R32, R37, R44, R48	RES, SMD, 0805, 0Ω, 1/8W, TF, ROHS	0Ω user selectable resistors

ISL28xxEVAL1Z Top View



## ISL284XXEVAL1Z Schematic Diagram



Intersil Corporation reserves the right to make changes in circuit design, software and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that the Application Note or Technical Brief is current before proceeding.

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