

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 (± 2.5 VDC) down to +2.4VDC (± 1.2 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 (± 1.2 VDC to ± 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_+ , V_- , and GND 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_1 and C_2 , connect to GND through R_1 and R_2 , 0Ω resistors. Resistors R_3 and R_4 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 ± 1 V/ μ s. Anti-reverse diodes D_1 and D_2 protect the circuit in the case of accidental polarity reversal.

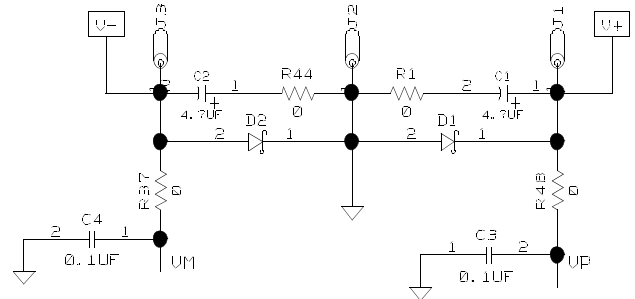


FIGURE 1. POWER SUPPLY CIRCUIT

Amplifier Configuration (Figure 2)

The schematic of 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 ± 1.2 VDC to ± 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.

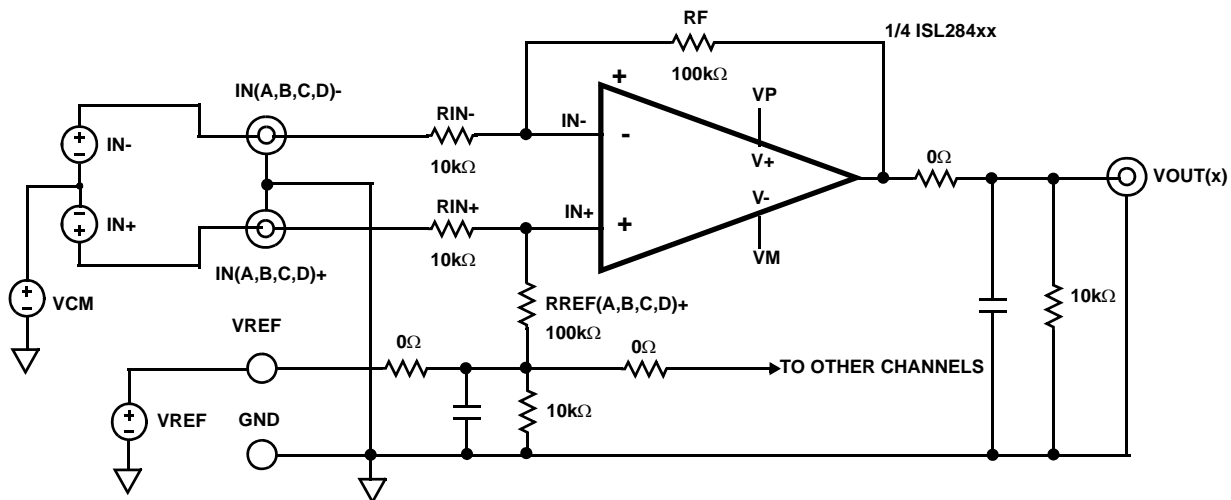


FIGURE 2. BASIC AMPLIFIER CONFIGURATION

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.

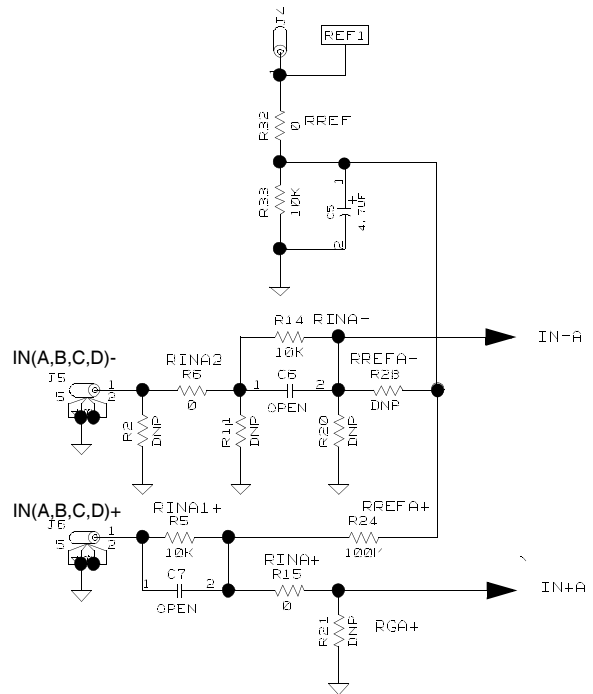
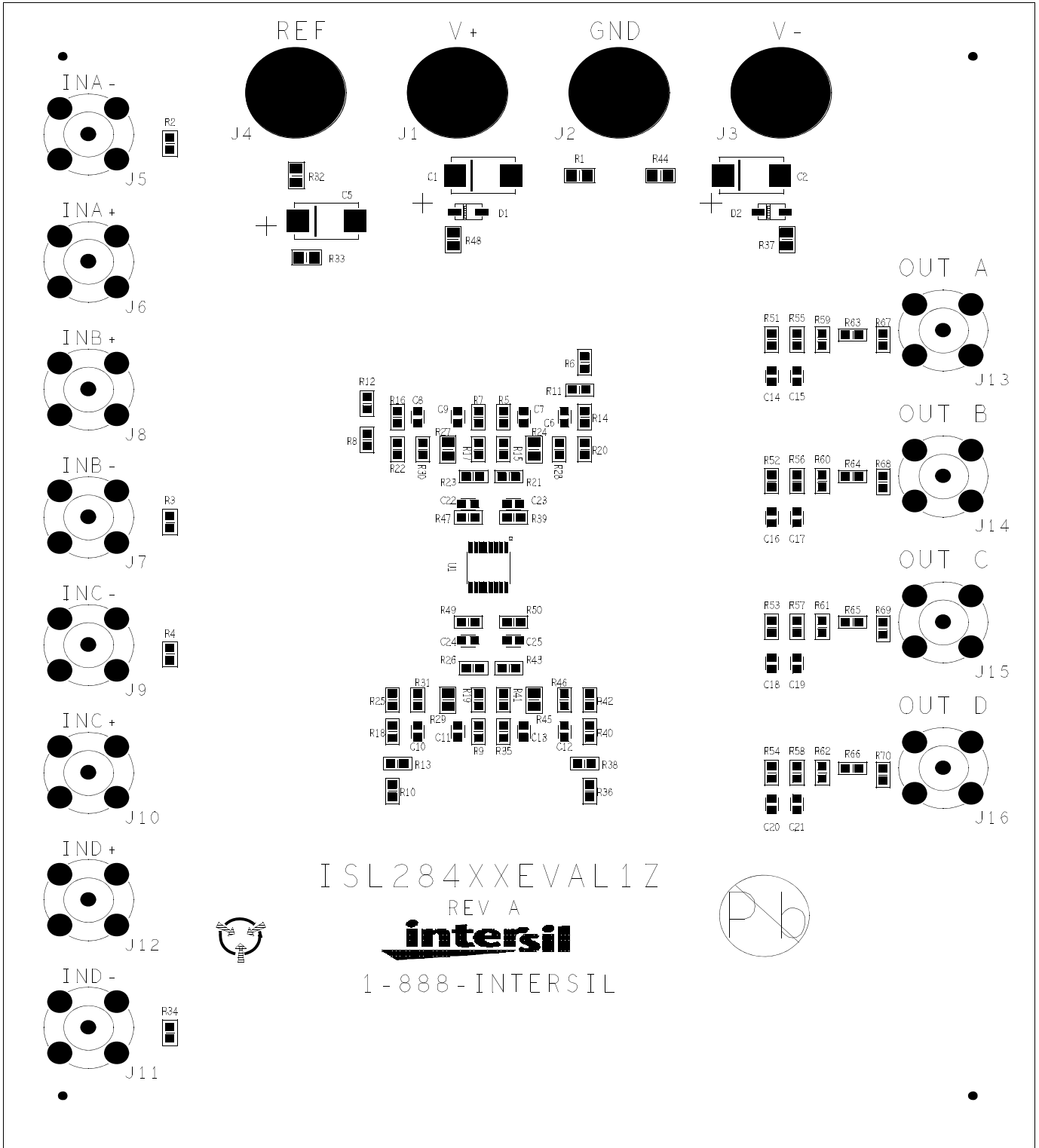


FIGURE 3. COMPONENT-SELECTABLE OPTIONS

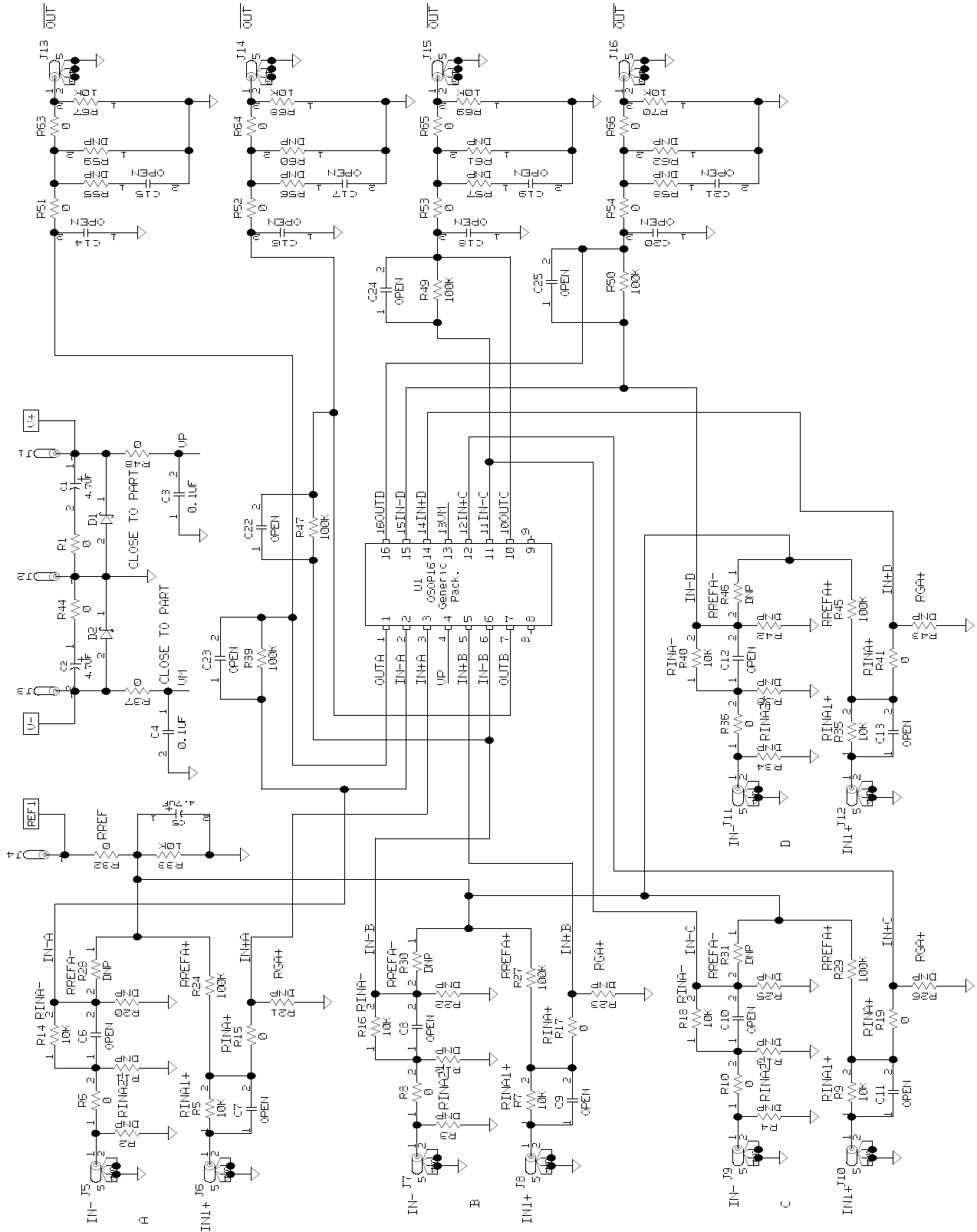
ISL284xxEVAL1Z Components Parts List

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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