

Introduction

The ISL2827xEVAL1Z evaluation board is a design platform containing all the circuitry needed to characterize critical performance parameters of the ISL28276 and ISL28278 dual operational amplifiers, using a variety of user defined test circuits.

The ISL2827x amplifiers feature 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

- ISL28276 Data Sheet, FN6301
- ISL28278 Data Sheet, FN6145

Evaluation Board Key Features

The ISL2827xEVAL1Z 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 2 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 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 C₁₂, C₁₇, connect to ground through R₁, R₄₆, 0 Ω resistors. Resistors R₄₀ and R₄₉ are 0 Ω 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. Two additional capacitors, C₁₀ and C₁₈, are connected close to the part to filter out high frequency noise. Anti-reverse diodes D₁, D₂ and zener diode D₃ protect the circuit in the case of accidental polarity reversal.

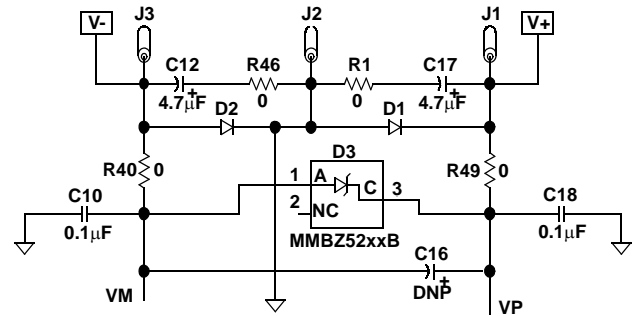


FIGURE 1. POWER SUPPLY CIRCUIT

Amplifier Configuration (Figure 2)

The schematic of each of the 2 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.

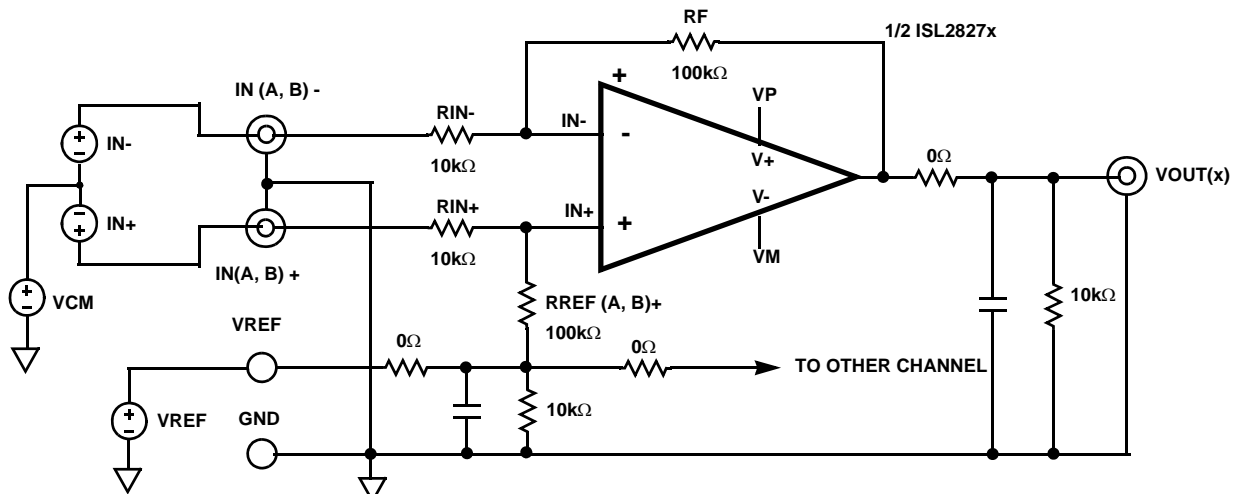


FIGURE 2. BASIC AMPLIFIER CONFIGURATION

User-Selectable Options (Figures 3 to 5)

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. The outputs (Figure 3) have additional resistor and capacitor placements for loading.

A voltage divider and filter option (Figure 4) 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.

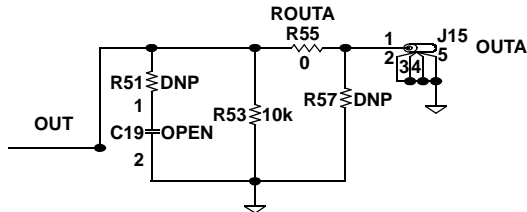


FIGURE 3. 1/2 OUTPUT STAGE

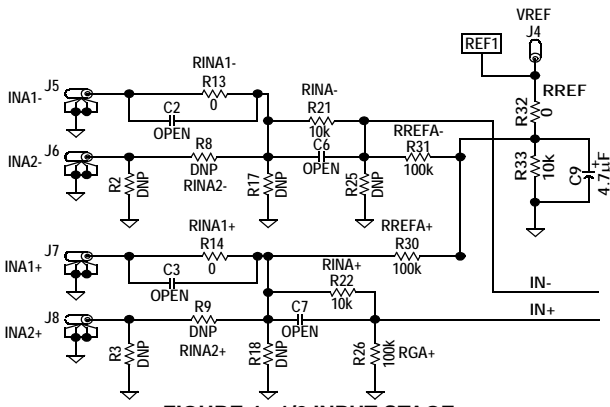


FIGURE 4. 1/2 INPUT STAGE

In the standard configuration (Figure 5), R₄₁ and R₄₅ are RF feedback resistors for the two independent amplifiers, set for AV = 10. Resistors R₄₇ and R₄₈ connect the DUT output to the output circuit (Figure 3). The additional unpopulated components, R₃₄ to R₃₉, R₄₂ to R₄₄, C₁₀, C₁₁, C₁₃ to C₁₅ and C₁₈ allow the user to configure the board for a variety of other applications such as cascaded gain stages, active feedback loops, etc.

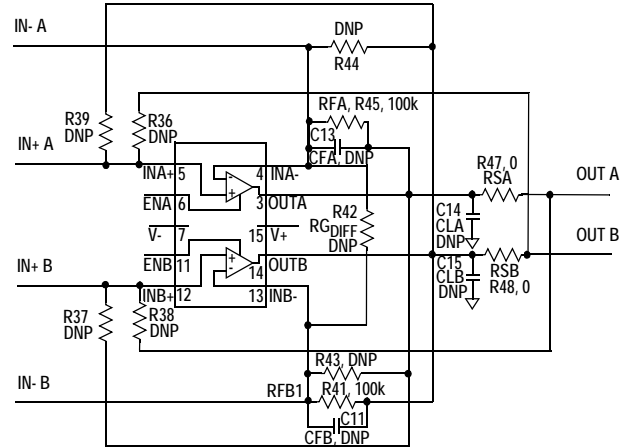
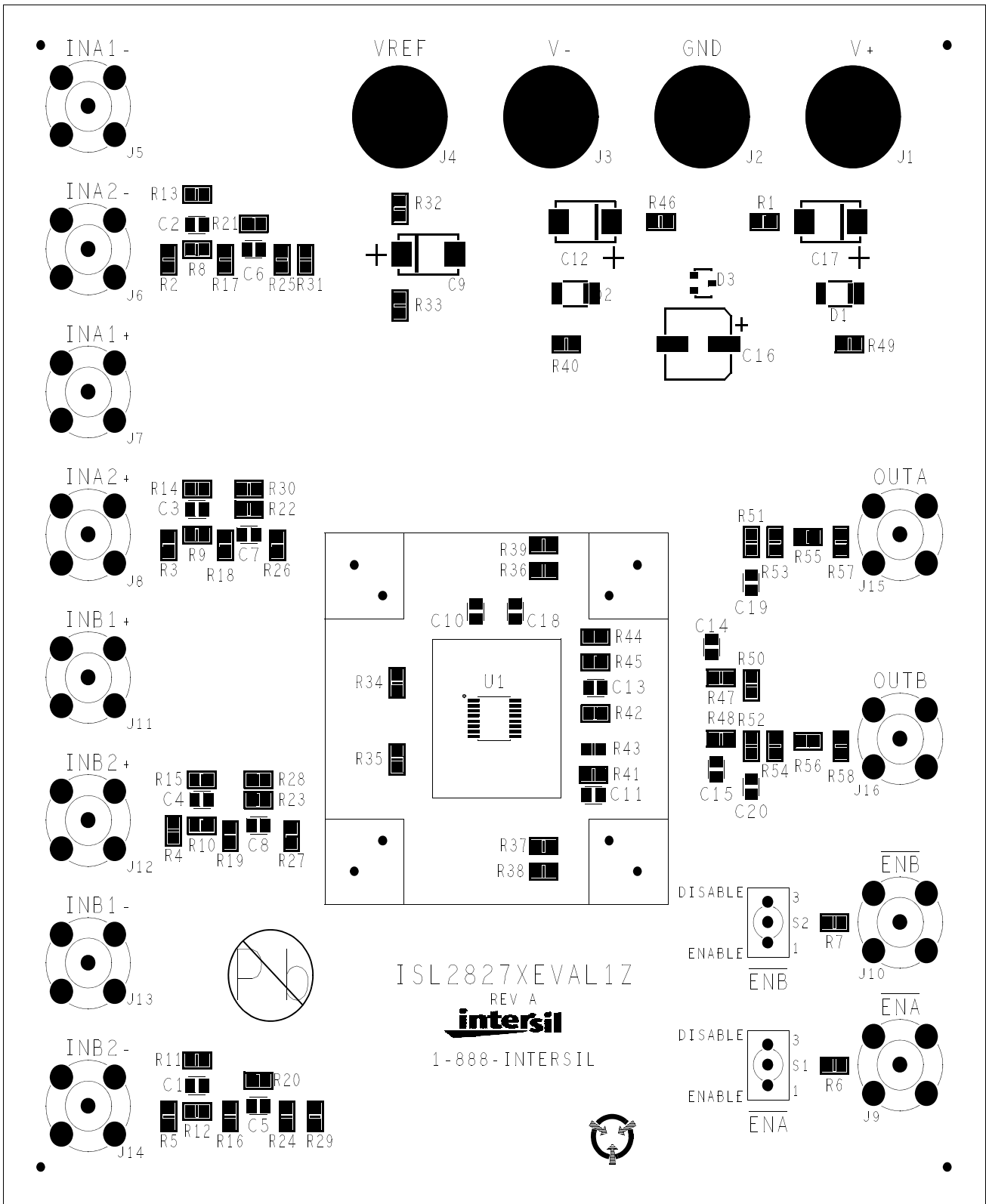


FIGURE 5. OPTICAL COMPONENTS

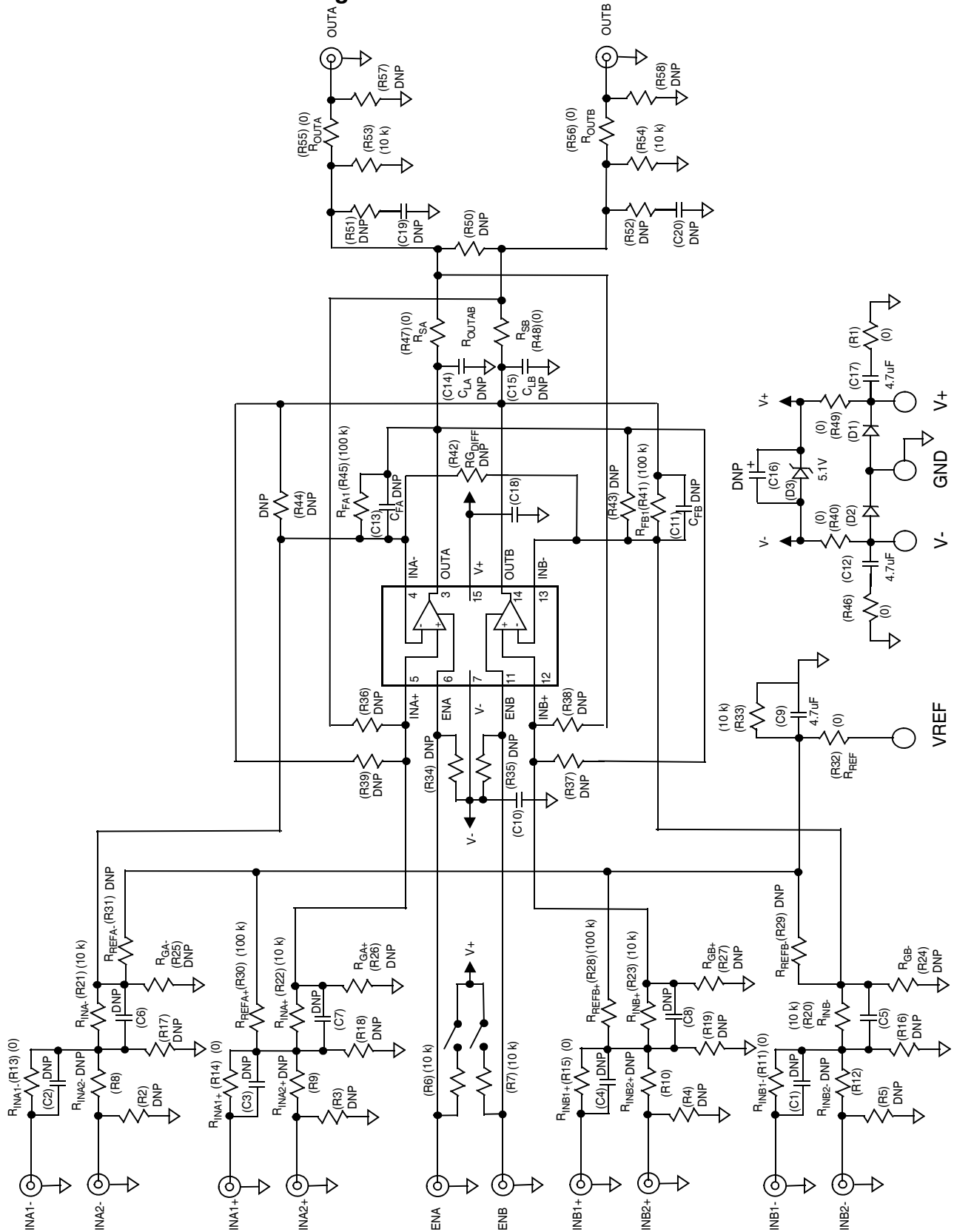
ISL2827xEVAL1Z Components Parts List

DEVICE NUMBER	DESCRIPTION	COMMENTS
C9, C12, C17	CAP-TANTALUM, SMD, D, 4.7µF, 50V, 10%, LOW ESR, ROHS	Power supply decoupling
C10, C18	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
D3	DIODE-ZENER, SMD, OD-123, 2P, 5.1V, 350mV, ROHS	Reverse power protection
U1 (ISL28276EVAL1Z)	ISL28276FAZ, IC-RAIL-TO-RAIL PRECISION OP AMP, 16P, QSOP, ROHS	
U1 (ISL28278EVAL1Z)	ISL28278FAZ, IC-RAIL-TO-RAIL PRECISION OP AMP, 16P, QSOP, ROHS	
R2-R5, R8-R10, R12, R16-R19, R24-R27, R29, R31, R34-R39, R42-R44, R50-R52, R57, R58	RESISTOR, SMD, 0603, 0.1%, MF, DNP-PLACE HOLDER	User selectable resistors - not populated
R1, R11, R13-R15, R24, R25, R32, R40, R46-R49, R55, R56	RES, SMD, 0603, 0Ω, 1/10W, TF, ROHS	0Ω user selectable resistors
R6, R7, R20-R23, R33, R53, R54	RES, SMD, 0603, 10k, 1/10W, 1%, TF, ROHS	RG gain resistors
R28, R30, R41, R45	RES, SMD, 0603, 100k, 1/10W, 1%, TF, ROHS	RF gain resistors

ISL2827xEVAL1Z Top View



ISL2827xEVAL1Z Schematic Diagram



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