

ISL2828xEVAL1Z

Evaluation Board User Guide

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The ISL2828xEVAL1Z evaluation board is a design platform containing all the circuitry needed to characterize critical performance parameters of the ISL28286 and ISL28288 dual operational amplifiers, using a variety of user defined test circuits.

The ISL2828x 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 ( $\pm 2.5VDC$ ) down to +2.4VDC ( $\pm 1.2VDC$ ).

Reference Documents

- ISL28286 Data Sheet, FN6312
- ISL28288 Data Sheet, FN6339

Evaluation Board Key Features

The ISL2828xEVAL1Z is designed to enable the IC to operate from a single supply (+2.4VDC to +5VDC), or from split supplies ( $\pm 1.2VDC$  to  $\pm 2.5V$ ). 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 C<sub>12</sub>, C<sub>17</sub>, connect to ground through R<sub>1</sub>, R<sub>46</sub>, 0 $\Omega$  resistors. Resistors R<sub>40</sub> and R<sub>49</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  $\pm 1V/\mu s$ . Two additional capacitors, C<sub>10</sub> and C<sub>18</sub>, are connected close to the part to filter out high frequency noise. Anti-reverse diodes D<sub>1</sub>, D<sub>2</sub> and zener diode D<sub>3</sub> protect the circuit in the case of accidental polarity reversal.

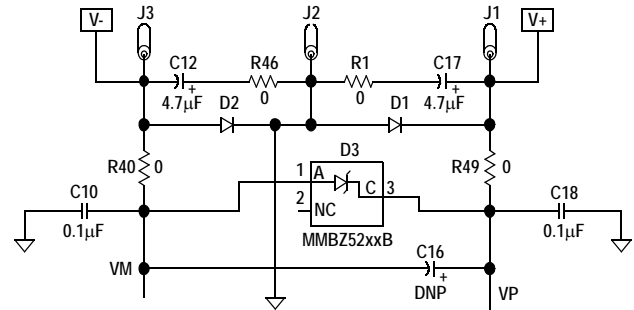


FIGURE 1. POWER SUPPLY CIRCUIT

Amplifier Configuration (Figure 2)

The schematic of each of the 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  $\pm 1.2VDC$  to  $\pm 2.5VDC$ . 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.

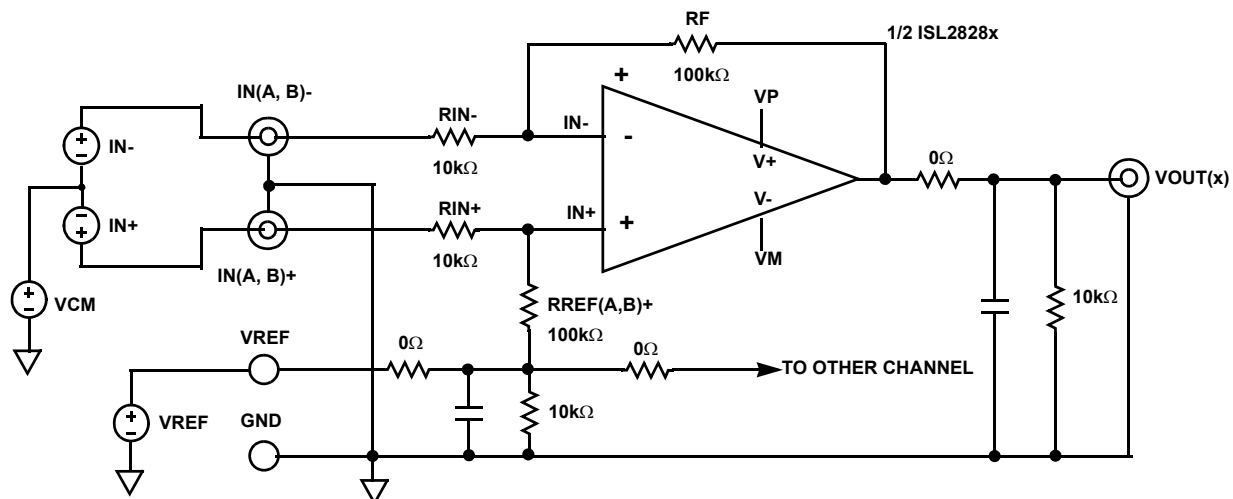
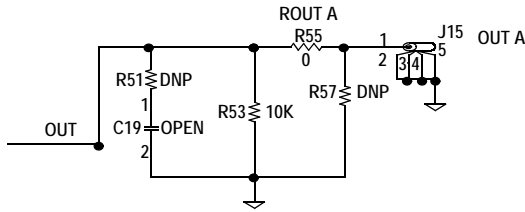


FIGURE 2. BASIC AMPLIFIER CONFIGURATION

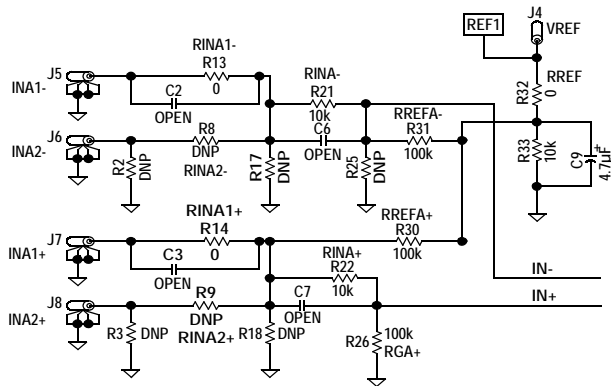
**User-Selectable Options (Figures 3 to 5)**

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.

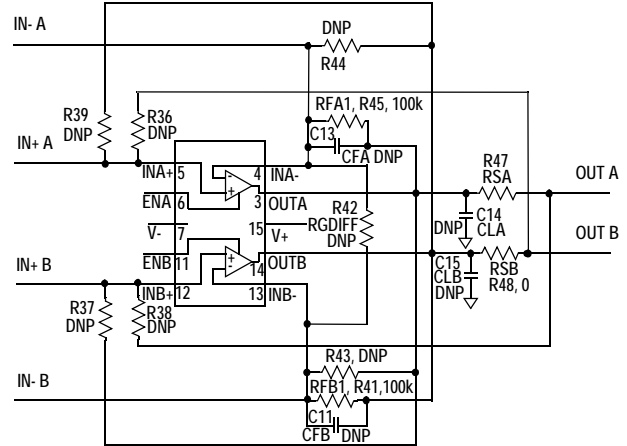


**FIGURE 3. 1/2 OUTPUT STAGE**



**FIGURE 4. 1/2 INPUT STAGE**

In the standard configuration (Figure 5), R<sub>41</sub> and R<sub>45</sub> are RF feedback resistors for the two independent amplifiers, set for AV = 10. Resistors R<sub>47</sub> and R<sub>48</sub> connect the DUT output to the output circuit (Figure 3). The additional unpopulated components, R<sub>34</sub> to R<sub>39</sub>, R<sub>42</sub> to R<sub>44</sub>, C<sub>10</sub>, C<sub>11</sub>, C<sub>13</sub> to C<sub>15</sub> and C<sub>18</sub> allow the user to configure the board for a variety of other applications such as cascaded gain stages, active feedback loops, etc.

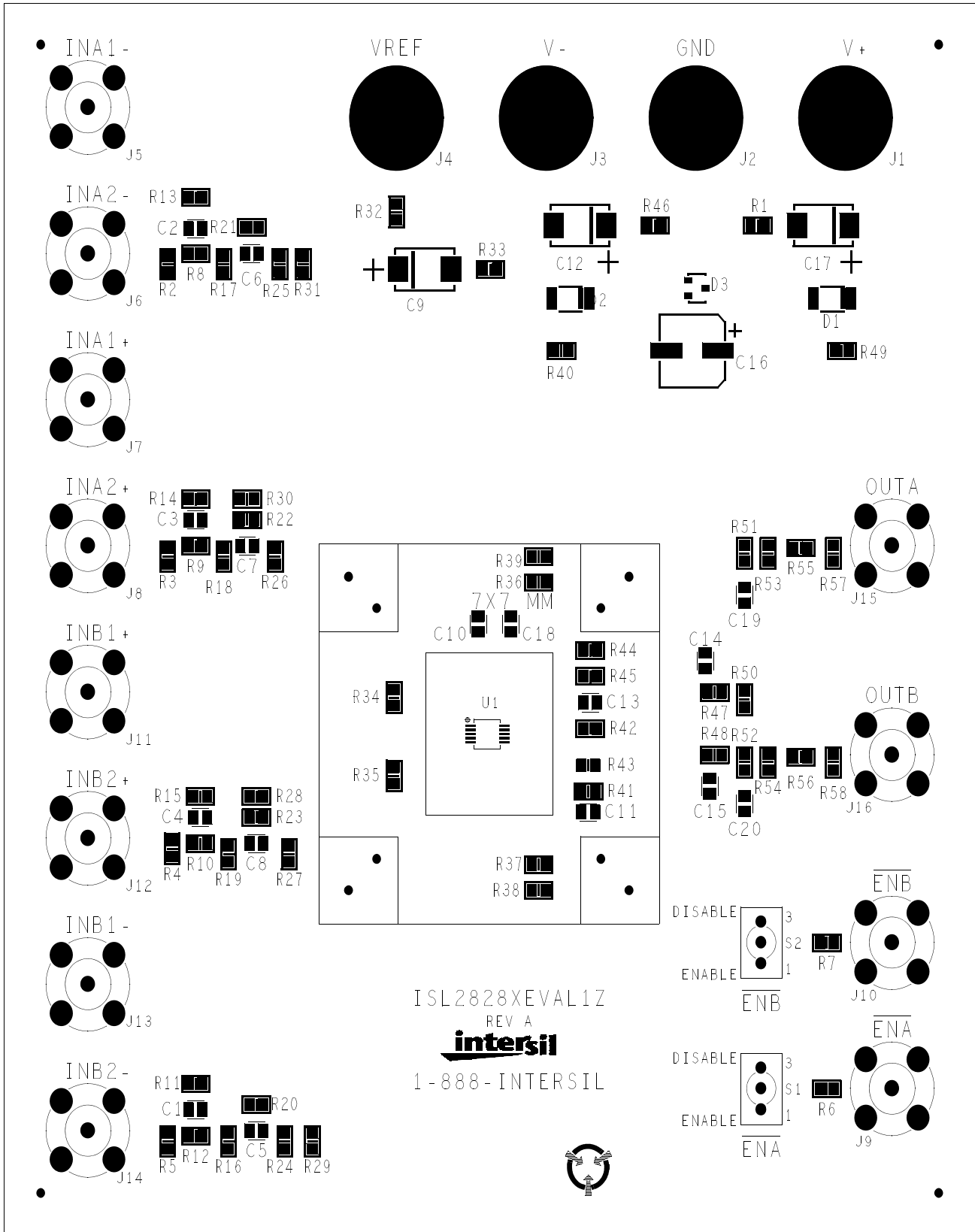


**FIGURE 5. OPTIONAL COMPONENTS**

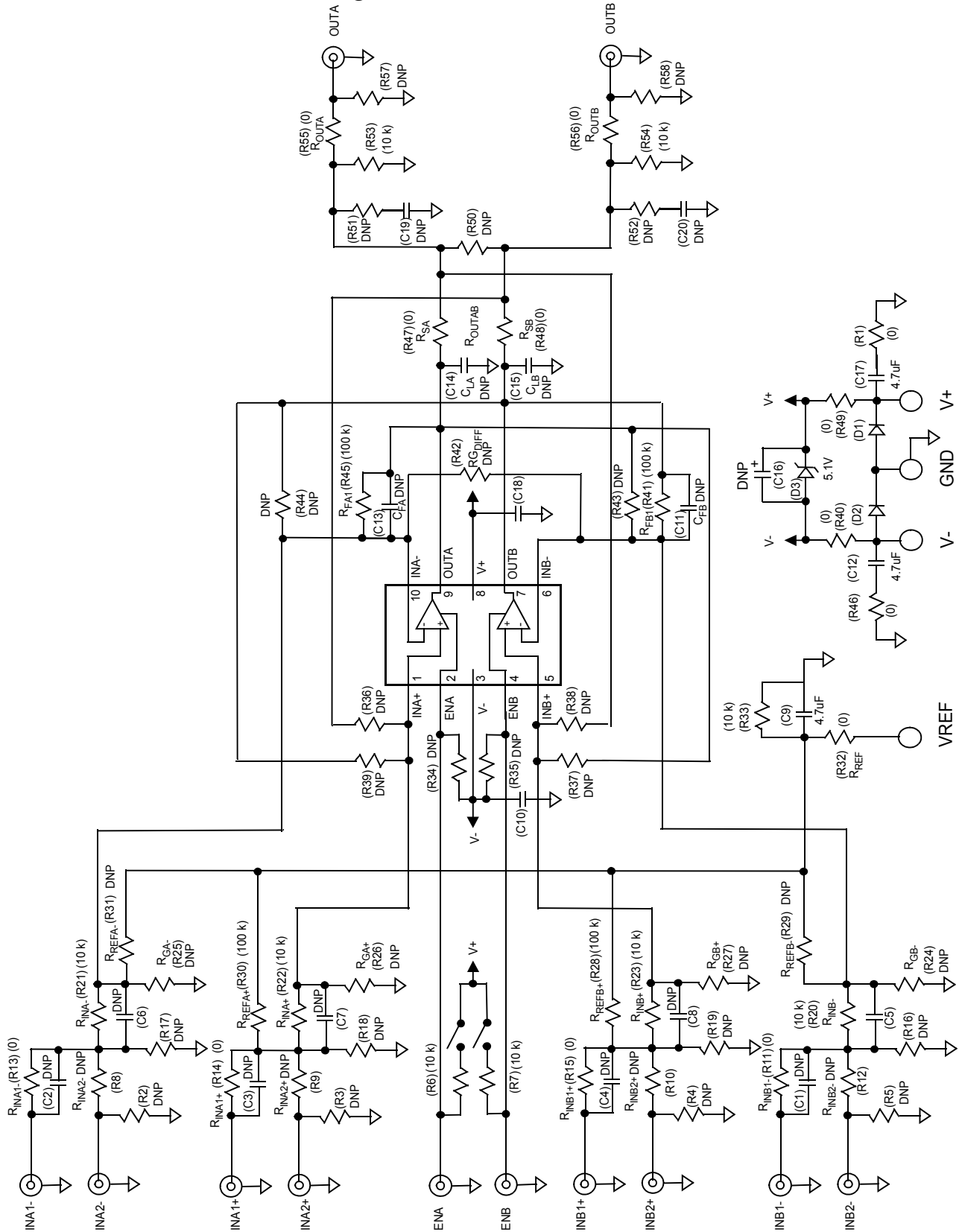
**ISL2828xEVAL1Z Components Parts List**

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, SOD-123, 2P, 5.1V, 350mV, ROHS	Reverse power protection
U1 (ISL28286EVAL1Z)	ISL28286FAZ, IC-RAIL-TO-RAIL PRECISION OP AMP, 16P, QSOP, ROHS	
U1 (ISL28288EVAL1Z)	ISL28288FAZ, 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, 0W, 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

**ISL2828xEVAL1Z Top View**



ISL2828xEVAL1Z Schematic Diagram



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