LMP2021MAEVAL - Bridge Sensor Instrumentation Amplifier Evaluation Board User Guide

National Semiconductor
Application Note 1932
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The LMP2021MAEVAL Instrumentation Amplifier Evaluation Board is configured as a differential-in, differential-out amplifier using the LMP2021. Also included is a precision reference and buffer to drive a bridge sensor. The board is set up to be used with the ADC141S626 Evaluation Board (Part Number: ADC141S626EB).

Power

J3 Connect to the positive supply.

J4 Connect to ground.

J5 If using dual supplies connect to the negative supply. If using a single supply short J5 to ground.

J7 Pin 1 of J2 can be used to power the ADC141S626EB Evaluation Board, which requires +5V. If J3 is +5V, JP3 can be shorted to provide +5V to the ADC141S626EB Evaluation Board. If J3 is not +5V, leave JP3 open and connect +5V to J7.

Input Signal and Bridge Excitation

J1 is used to power the bridge sensor and input the signal from the bridge to the amplifier. The LM4120 (U4) provides a precision +5V reference. This is buffered by the LMP7741 (U5) and supplied on pin 1 of J1 to power the bridge sensor. The bottom of the bridge sensor can be connected to pin 2 which is connected to ground. The outputs of the bridge sensor can be connected to pins 3 and 5 of J1.

Output Signal

The output of the amplifier is available on pins 3 and 5 of J2. This connector is pin-to-pin compatible with the input connector of the ADC141S626EB Evaluation Board.

Amplifier Gain

The gain of the amplifier is set using R1, R10, R11, and R12. If R11 = R12, the gain of the amplifier is 1 + (2R11)/(R1||R10).

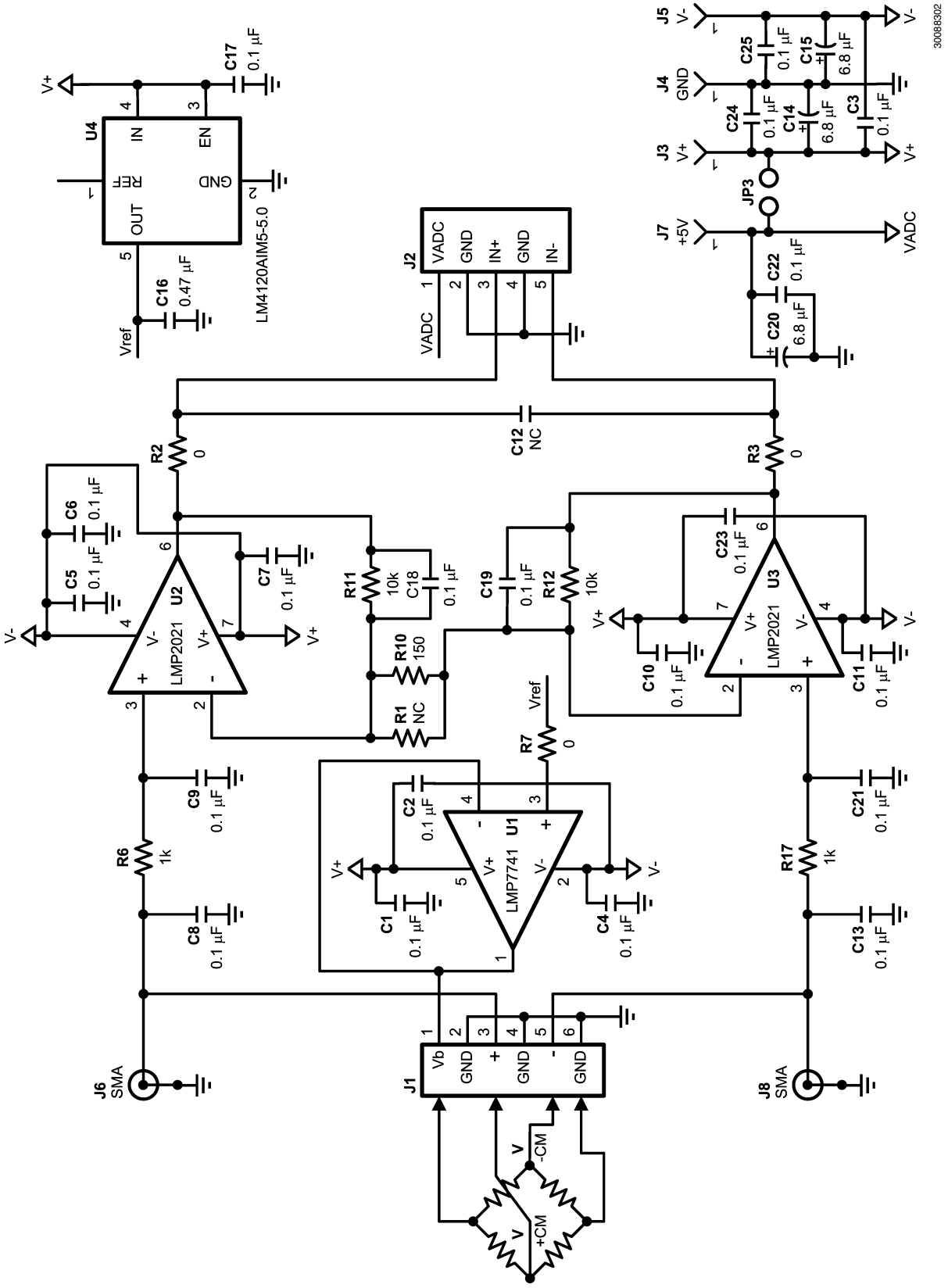

FIGURE 1. Schematic

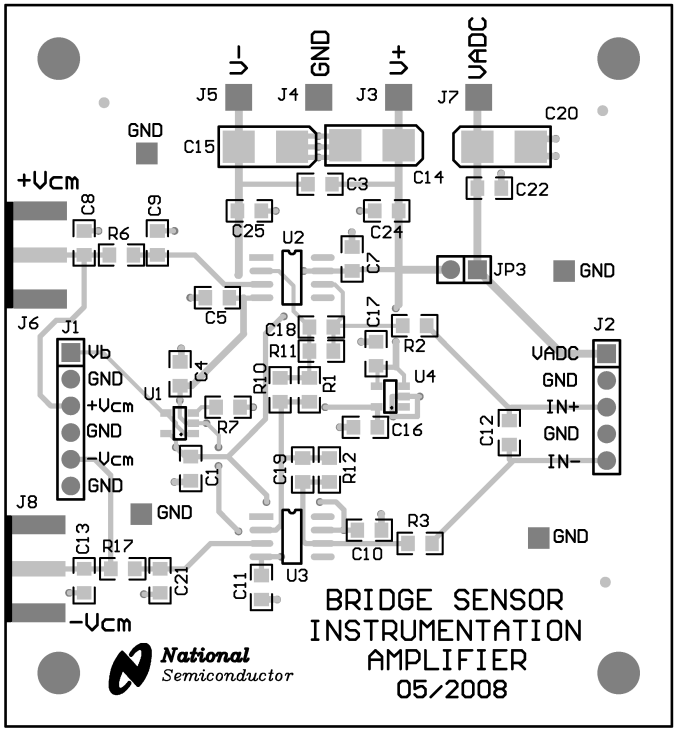

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FIGURE 2. PCB Top

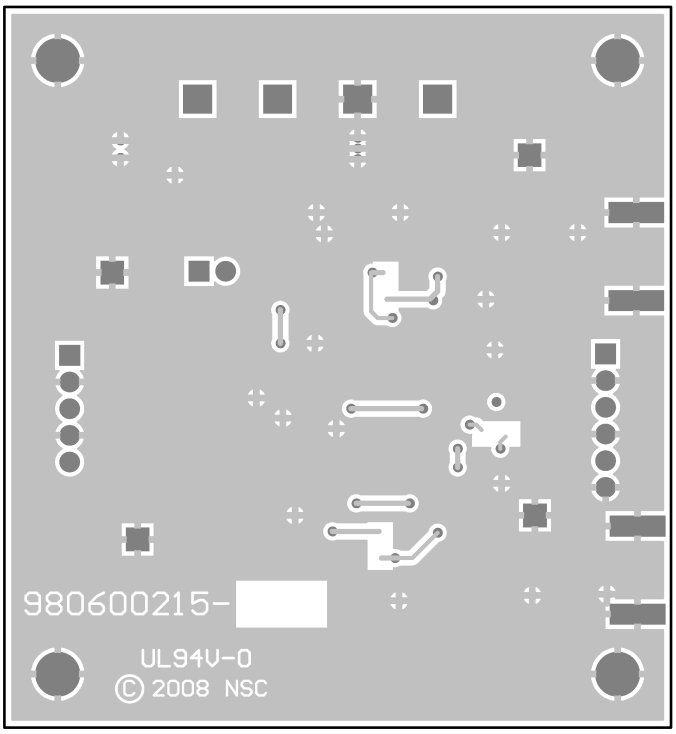

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FIGURE 3. PCB Bottom

Notes

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LVDS	www.national.com/lvds	Packaging	www.national.com/packaging
Power Management	www.national.com/power	Green Compliance	www.national.com/quality/green
Switching Regulators	www.national.com/switchers	Distributors	www.national.com/contacts
LDOs	www.national.com/ldo	Quality and Reliability	www.national.com/quality
LED Lighting	www.national.com/led	Feedback/Support	www.national.com/feedback
Voltage Reference	www.national.com/vref	Design Made Easy	www.national.com/easy
PowerWise® Solutions	www.national.com/powerwise	Solutions	www.national.com/solutions
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