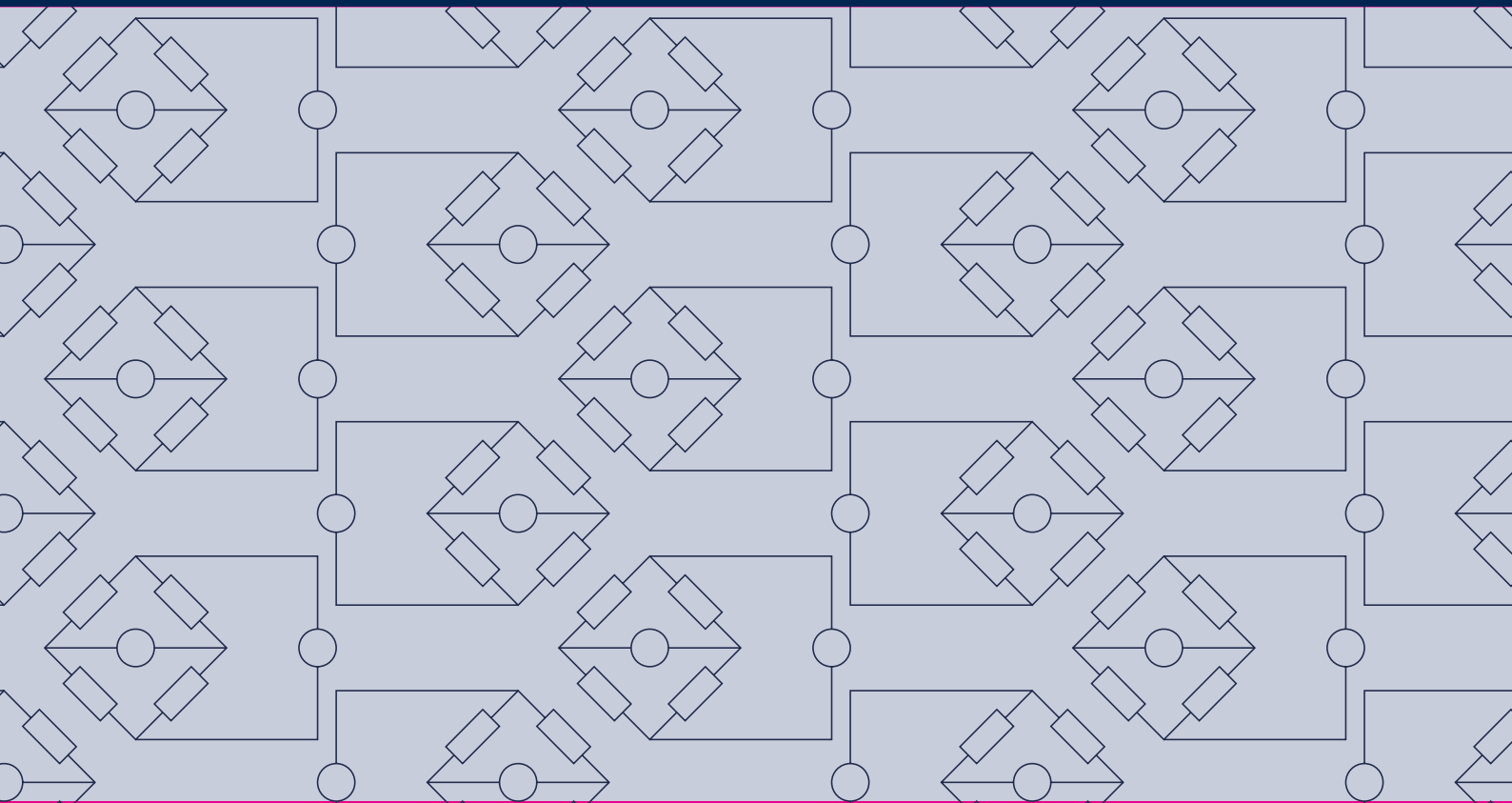


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Constant current excitation for SSO compensated stainless steel pressure sensors

Application note



Constant current excitation for SSO compensated stainless steel pressure sensors

INTRODUCTION

First Sensors SSO series offers rugged OEM pressure sensors in a fully welded, media isolated stainless steel construction. These devices are temperature compensated from 0...50 °C when using constant current excitation. This application note describes the design of an appropriate constant current source.

CIRCUIT DESIGN

To achieve a constant current source a circuit with a single operational amplifier is used as shown in Fig. 1. The current source is controlled by a ±1 % band-gap

reference diode Z_R . The reference current I_R is defined by

$$I_R = \frac{(V_R - V_O)}{R_2}$$

where

- V_R = Diode reference voltage (1.235 V ±1 %)
- V_O = Amplifier offset voltage (~0 V)
- R_2 = Current set resistor (820 Ω)

Selecting amplifier A_1 with an offset voltage <1 mV and a ±0.1 % tolerance resistor R_2 with a standard value of 820 Ω delivers a current of $I_R = 1.506$ mA with a typical accuracy of ±1.2 %.

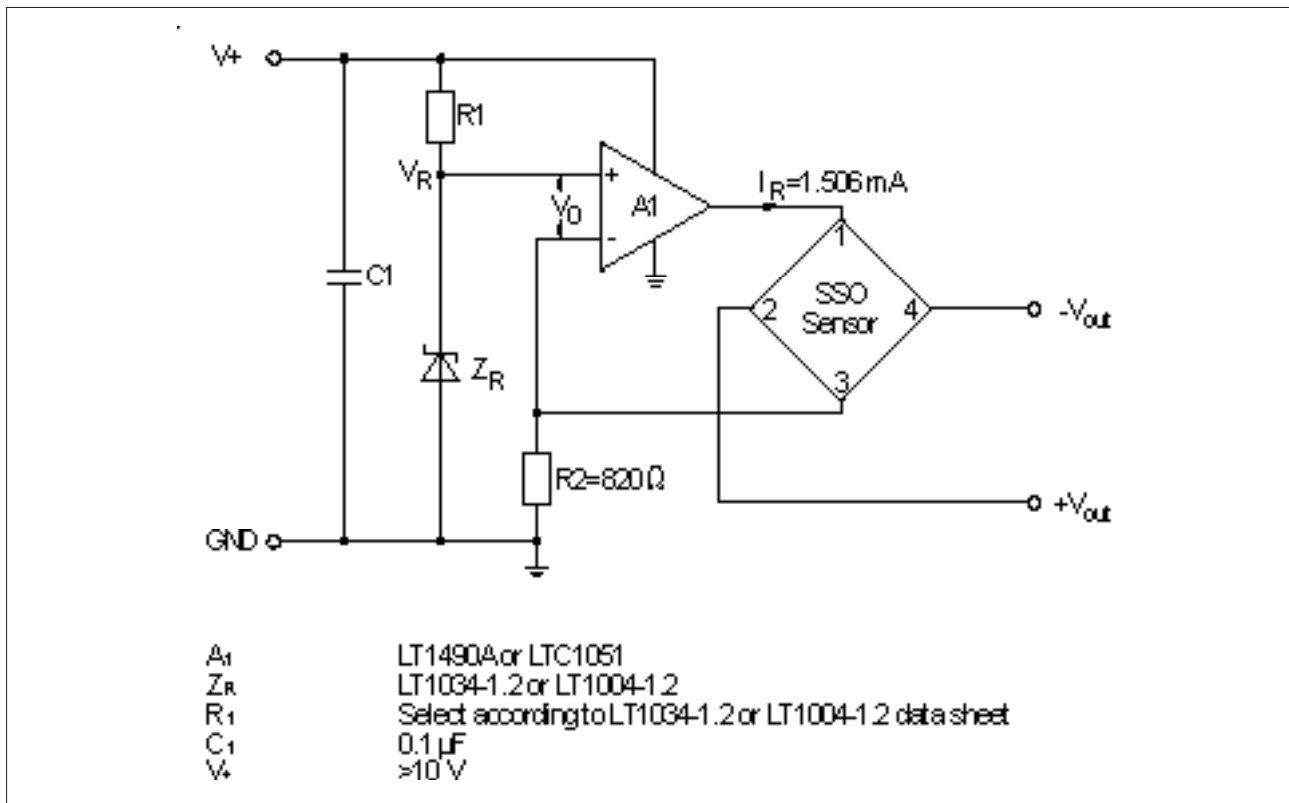


Figure 1: Constant current source for First Sensors SSO temperature compensated pressure sensors

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