



Four-Channel, Isolated Thermocouple/mV Conditioners

Models 2B54/2B55

FEATURES

- Low Cost Per Channel
- Wide Input Span Range: $\pm 5\text{mV}$ to $\pm 100\text{mV}$ (2B54)
 $\pm 50\text{mV}$ to $\pm 5\text{V}$ (2B55)
- Pin Compatible with 2B34 RTD Conditioner
- High CMV Isolation: $\pm 1000\text{V}$ dc; CMR = 156dB min @ 60Hz
- Low Input Offset Voltage Drift: $\pm 1\mu\text{V}/^\circ\text{C}$ max (2B54B)
- Low Gain Drift. $\pm 25\text{ppm}/^\circ\text{C}$ max (2B54B)
- Low Nonlinearity: $\pm 0.02\%$ max ($\pm 0.012\%$ typ)
- Normal Mode Input Protection (130V rms) and Filtering
- Channel Multiplexing: 400 chan/sec Scanning Speed
- Solid State Reliability

APPLICATIONS

- Multichannel Thermocouple Temperature Measurements
- Low and High Level Data Acquisition Systems
- Industrial Measurement and Control Systems

GENERAL DESCRIPTION

Models 2B54 and 2B55 are low cost, high performance, four-channel signal conditioners. Both models are functionally complete, providing input protection, isolation and common mode rejection, multiplexing, filtering and amplification.

The 2B54 has been designed to condition low level signals ($\pm 5\text{mV}$ to $\pm 100\text{mV}$), like those generated by thermocouples or strain gages, in the presence of high common mode voltages. The 2B55 is optimized to condition $\pm 50\text{mV}$ to $\pm 5\text{V}$ or 4 to 20mA transmitter signals as inputs. The four-channel structure of both models results in significant cost and size reduction.

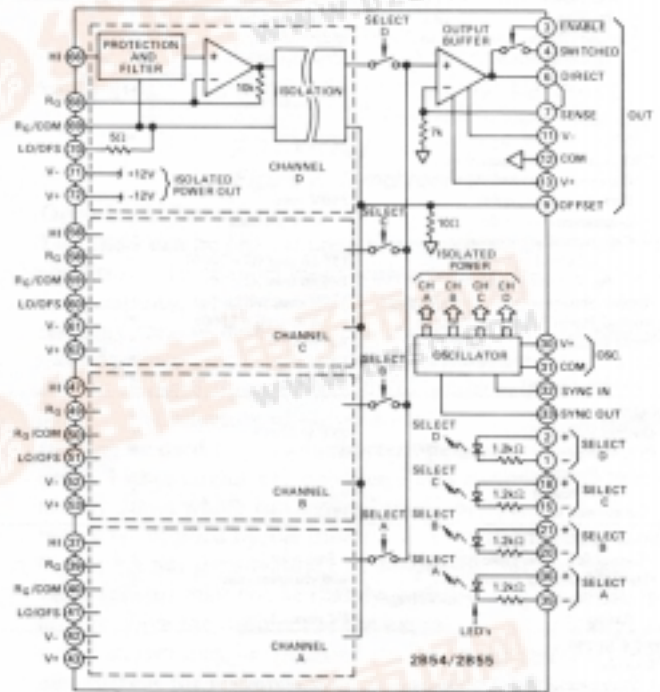
The high performance of the 2B54 and 2B55 is accomplished by the use of reliable transformer isolation techniques and an amplifier-per-channel architecture. Each of the input channels is galvanically isolated ($\pm 1000\text{V}$ dc) from the other input channels and from output ground. The amplifier-per-channel structure is used to obtain low input drift ($\pm 1\mu\text{V}/^\circ\text{C}$ max, 2B54B), high common mode rejection (156dB @ 60Hz), and very stable gain ($\pm 25\text{ppm}/^\circ\text{C}$ max). Other key features include low input noise ($1\mu\text{V}$ p-p), low nonlinearity ($\pm 0.02\%$ max) and open-thermocouple detection (2B54).

APPLICATIONS

Models 2B54 and 2B55 were designed to serve as a superior alternative to the relay multiplexing circuits used in multi-channel data acquisition systems, computer interface systems, process signal isolators, and temperature measurement and control instrumentation. Advantages over relay circuits include functional versatility, superior performance, and solid state reliability. Both models are also pin compatible with the 2B34, four-channel RTD/strain gage conditioner.

In thermocouple temperature measurement applications, outstanding low drift, high noise rejection, high throughput and 1000V isolation make the 2B54 a natural choice over flying capacitor multiplexers in conditioning any thermocouple type.

2B54/2B55 FUNCTIONAL BLOCK DIAGRAM



When cold junction compensation is required in measurement of temperature with thermocouples, the 2B54 may be used directly with the model 2B56 Universal Cold junction Compensator.

DESIGN FEATURES AND USER BENEFITS

High Reliability: To assure high reliability and provide isolation protection to electronic instrumentation, reliable transformer isolation and solid state switching are used. Both models have been conservatively designed to meet the IEEE standard for Transient Voltage Protection (472-19 74: SWC) and offer 130V rms normal mode input protection.

High Noise Rejection: To preserve high system accuracy in electrically noisy industrial environments, the 2B54 and 2B55 provide excellent common mode noise rejection, RFI/EMI immunity, and low pass filtering for rejection of series mode noise and 50Hz/60Hz pickup.

Ease of Use: The multichannel, functionally complete design in a compact (2" X 4" X 0.4") module, assures ease of use, conserves board space and eliminates the need for a number of discrete components necessary in relay multiplexing circuits.

Low Cost: The 2B54 and 2B55 offer the lowest cost per channel for isolated, solid state, low level signal conditioners.



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