Economy, Wideband Log/Antilog Amplifiers

Models 759N, 759P

FEATURES
Low-Cost, Complete Log/Antilog Amplifier
External Components Not Required;
Internal Reference; Temperature Compensated
Small Size: 1.1" x 1.1" x 0.4"
Fast Response: 200kHz Bandwidth (I_{SIG} @ 1μA)
6 Decades Current Operation - 1nA to 1mA
1% max Error - 20nA to 200μA
2% max Error - 10nA to 1mA
4 Decades Voltages Operation - 1 mV to 10V
1% max Error - 1mV to 2V
2% max Error - 1mV to 10V

APPLICATIONS
Log Current or Voltage
Antilog Voltage
Data Compression or Expansion

GENERAL DESCRIPTION

Models 759N and 759P are low cost, fast response, dc logarithmic amplifiers offering 1% conformance to ideal log operation over four decades of current operation - 20nA to 200μA, as well as 2% conformance over four decades of voltage operation - 1mV to 10V. Featuring 200kHz bandwidth at I_{SIG} = 1μA, these new economy designs are the industry's fastest log/antilog amplifiers and offer an attractive alternative to in-house designs.

Designed for ease of use, models 759N/P are complete, temperature compensated, log or antilog amplifiers packaged in a small 1.1" x 1.1" x 0.4" epoxy encapsulated module. External components are not required for logging currents over the complete six decade operating range from 1nA to 1mA. Both the scale factor (K = 2, 1, 2/3 volt/decade) and log/antilog operation can be selected by simple pin interconnection. In addition both the internal 10μA reference current as well as the offset voltage may be externally adjusted to improve overall accuracy performance.

MODEL SELECTION

Model 759N computes the log of positive input signals (voltage or current), while model 759P computes the log of negative input signals (voltage or current). In the antilog mode of operation, both models accept bipolar voltage input signals (-2V≤E_{SIG}/ K≤-2V), with model 759N producing a positive output signal and model 759P producing a negative output signal.

APPLICATIONS

Model 759N and 759P can operate with either current or voltage inputs when connected as shown in Figure 1. To illustrate the logarithmic transfer characteristics, a plot of input current versus output voltage is also presented. Model 759 is ideally suited for log applications whenever low cost implementation of logarithmic natural relationships is advantages. Examples are absorbence measurements, data compression and expansion, chemical analysis of liquids, computing powers, roots and ratios and conversion of exponential quantities to linear form.

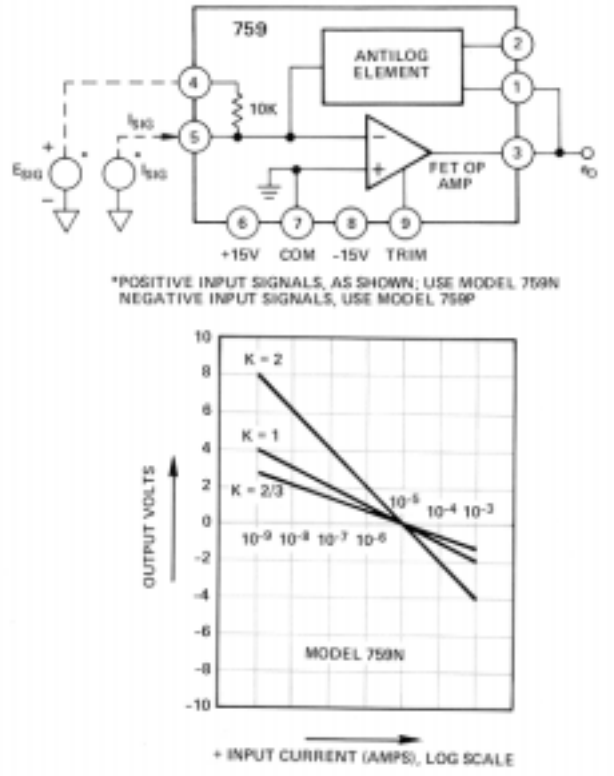

Figure1. Functional Block Diagram and Transfer Function

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