AD5748 Industrial Current Voltage Output Driver with Programmable Ranges

General Description:

The AD5748 is a single-channel, low cost, precision, voltage/current output driver with hardware or software programmable output ranges. The software ranges are configured via an SPI-/MICROWIRE™-compatible serial interface. The AD5748 targets applications in PLC and industrial process control. The analog input to the AD5748 is provided from a low voltage, single-supply, digital-to-analog converter (DAC) and is internally conditioned to provide the desired output current/voltage range. The analog input range is 0 V to 4.096 V.

The output current range is programmable across two current ranges: 4 mA to 21 mA and 0 mA to 21 mA. Voltage output is provided from a separate pin that can be configured to provide 0 V to 5 V, 0 V to 10.5 V, or ±10.5 V output range.

Analog outputs are short-circuit and open-circuit protected and can drive capacitive loads of 2 μF and inductive loads of 0.1 H. The device is specified to operate with a power supply range from ±12 V to ±24 V. Output loop compliance is 0 V to AVDD − 2.75 V.

The flexible serial interface is SPI- and MICROWIRE-compatible and can be operated in 3-wire mode to minimize the digital isolation required in isolated applications. The interface also features an optional PEC error checking feature using CRC-8 error checking, useful in industrial environments where data communication corruption can occur.

The device also includes a power-on-reset function, ensuring that the device powers up in a known state (0 V or tristate), and a asynchronous CLEAR pin that sets the outputs to zero scale/midscale voltage output or the low end of the selected current range.

An HW SELECT pin is used to configure the part for hardware or software mode on power-up.

Note that the plots in the Typical Performance Characteristics section of this data sheet contain information on the standard ranges, as released in the AD5750/AD5750-1 data sheet. Although the overranges have been tested, new plots were not generated and substitution data was used for plotting purposes.

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Key Features:

- Current output ranges:
  - 4 mA to 21 mA, 0 mA to 21 mA
  - ±0.15% FSR total unadjusted error (TUE)
  - ±5 ppm/°C FSR typical output drift
- Voltage output ranges:
  - 0 V to 5 V, 0 V to 10.5 V, ±10.5 V
  - ±0.05% FSR total unadjusted error (TUE)
  - ±3 ppm/°C FSR output drift
- Flexible serial digital interface
- On-chip output fault detection
- PEC error checking
- Asynchronous CLEAR function
- Flexible power-up condition to 0 V or tristate
- Power supply range
  - AVDD: +12 V (± 10%) to +24 V (± 10%)
  - AVSS: −12 V (± 10%) to −24 V (± 10%)
- Output loop compliance to AVDD − 2.75 V
- Temperature range: −40°C to +105°C
- 32-lead, 5 mm × 5 mm LFCSP package

Applications:

- Process control
- Actuator control
- PLCs

Related Products Information:

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<th>MfrW Part #</th>
<th>Farnell #</th>
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<td>76R7609</td>
<td>Industrial Current Voltage Output Driver with Programmable Ranges-32 lead LFCSP package</td>
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