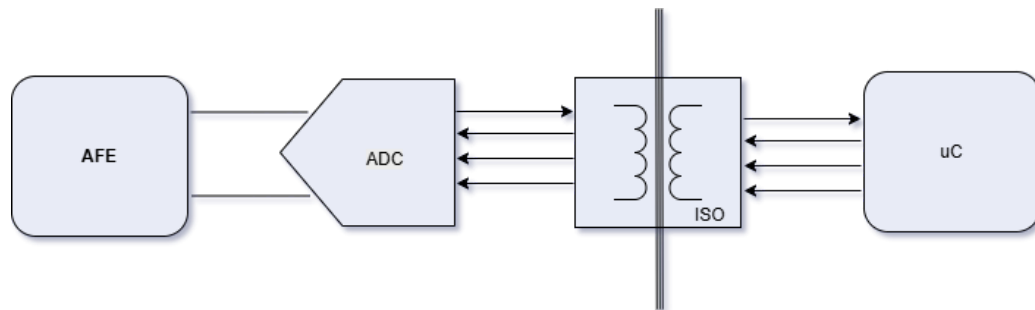


ISOLATION SOLUTIONS FOR PRECISION ADCS

AD4080 Fast Precision Isolated Solution for
Instrumentation Rev. 0 | May. 2025



FAST PRECISION ISOLATED SOLUTIONS FOR INSTRUMENTATION

AD4080 40Mps Differential SAR ADC



Example Applications

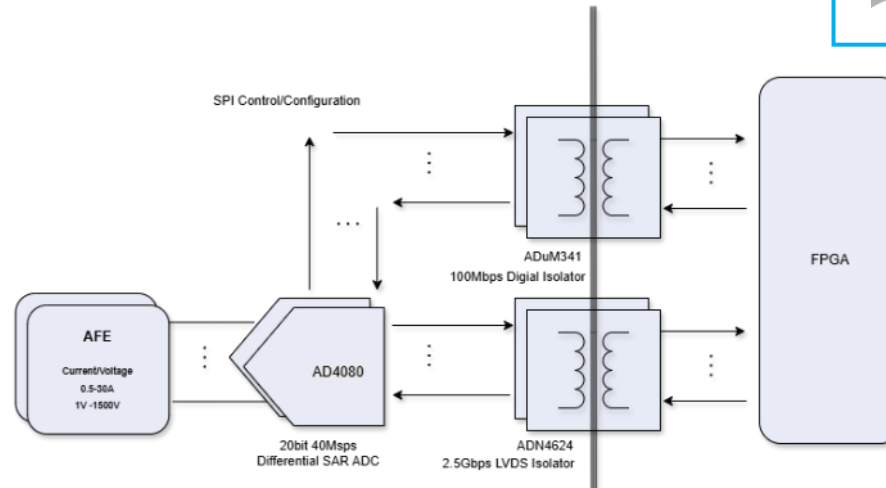
- ▶ Power Analyzers
- ▶ HV arbitrary Waveform Generators
- ▶ HV Oscilloscopes

Challenges / Performance Required

- ▶ High-accuracy
- ▶ Protection against noise and crosstalk, minimal noise effect on the measurement circuitry
- ▶ Fast data transmission
- ▶ Interfaces USB (3.0), Ethernet (VXI-11), and GP-IB
- ▶ Working voltage - 1000 V CAT II, 32A, 300V CAT II

ADI's Fast precision isolated solutions for instrumentation

- ▶ Channel to channel isolation
- ▶ Removal of expensive special optical
- ▶ Interface speeds 100Mbps/2.5Gbps
- ▶ Easily transmit large volumes of data, for fast analysis
- ▶ Superior timing for synchronization
- ▶ Low Jitter and Skew
- ▶ Robust data & guaranteed quality
- ▶ Size optimized for high density design
- ▶ Certified for standards
- ▶ IEC61010 1000 V CAT II



FAST PRECISION ISOLATED SOLUTIONS FOR INSTRUMENTATION

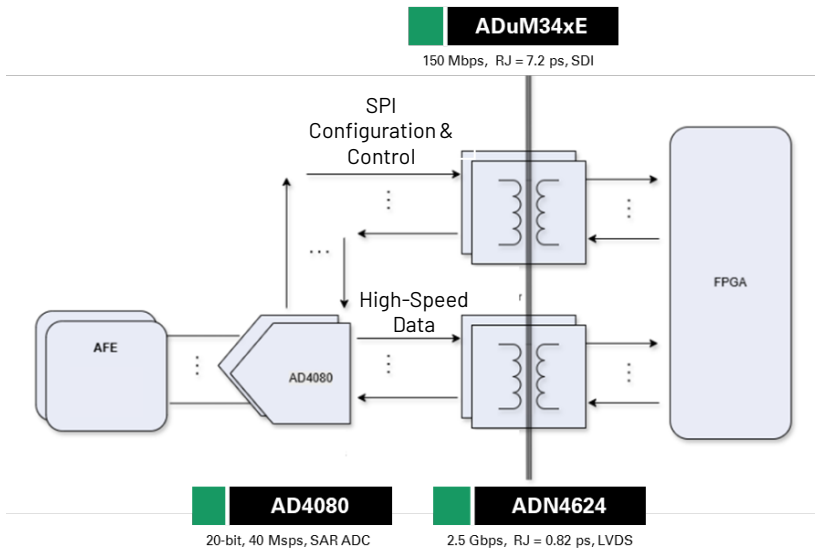
AD4080 40MSPs Differential SAR ADC



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| Performance Vectors for Low Power Instrumentation | |
|---|--|
| AD4080 40MSPs Differential SAR ADC | |
| Sample Rate | 40 MSPS |
| Excellent Accuracy (INL) | 8 ppm (max), 4 ppm (typ.) |
| Power Consumption | 80mW @ 40 MSPS |
| Low Spectral Noise Density | 8.8 nV/ $\sqrt{\text{Hz}}$ |
| Minimal Result Latency | 46.25 ns |
| ADuM341 150 Mbps Quad Digital Isolator | |
| Max Prop Delay | 10 ns |
| Jitter | 7.19 ps |
| SNR Impact @ 1 MHz | 86.90 dB (Additive Isolator Jitter = 7.19 ps) |
| Power Consumption | 5.4 mW/chan [1 Mbps @ 3.3V] |
| Robustness | ± 180 kV/ μs typ CMTI / High VISO |
| ADN462x 2.5GSPs LVDS Isolator | |
| Max Prop Delay | 2.8 ns |
| Jitter | 0.82 ps |
| SNR Impact @ 1 MHz | 105.8 dB (Additive Isolator Jitter = 0.82 ps) |
| Power Consumption | 330mW/chan [500 Mbps @ 1.8V] |
| Robustness | ± 100 kV/ μs typ CMTI / High VISO |



Available Resources



| | |
|--|---|
| Technical Documents | https://www.analog.com/en/products/ad4080.html https://www.analog.com/en/products/adn4624.html https://www.analog.com/en/products/adum341e.html |
| Evaluation Boards/Reference Designs | EVAL-AD4080-FMC EVAL-ADUM34XEEDZ EVAL-ADN4622/EVAL-ADN4624 |
| Tools & Simulations | LTSpice Demo Circuit - AD4080 with ADA945-1 AD408x IBIS Model ADN4624 IBIS Model ADuM340E, ADuM341E, ADuM342E IBIS Model |
| Engineer Zone | Interface and Isolation - EngineerZone (analog.com) Precision Technology Signal Chains Library - EngineerZone (analog.com) |
| Safety and Regulatory Compliance | Safety and Regulatory Certification for Isolation |