



FAST, PRECISE POWER-RAIL MEASUREMENTS FOR HIGH-SPEED TEST

SLATER CAMPBELL

Systems Design/Architecture Engineer

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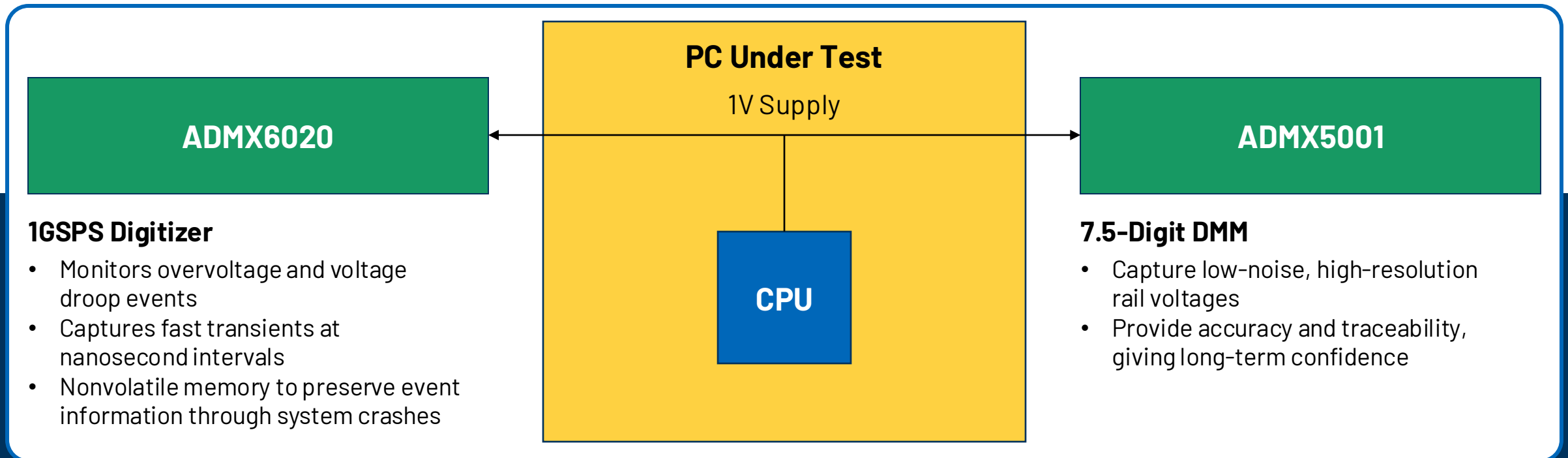
Systems Design/Architecture Engineer

IMS2026

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Power Rail Monitoring with High-Speed and Precision Solutions



Monitor the power rail integrity in real time with ADI's fast precision signal chains

Detect and analyze failure events in AI data centers as they occur

ADMX5001

A 7.5-Digit DMM Reference Design

Key Specifications

- Digitizer and averaged modes: V/I/R measurements, 0.06SPS to 2MSPS
- Wide voltage, current, and resistance measurement ranges
 - Voltage: 100mV to 1,000V DC and 50mV to 700V AC
 - Current: 10 μ A to 10A DC and 10 μ A to 10A AC
 - Resistance: from 100 Ω to 1G Ω , 2-wire or 4-wire
 - Frequency up to 200kHz
- Basic accuracy of 16ppm
- Nonlinearity <1ppm
- Rapid settling time
- High-speed interfaces, flexible programming

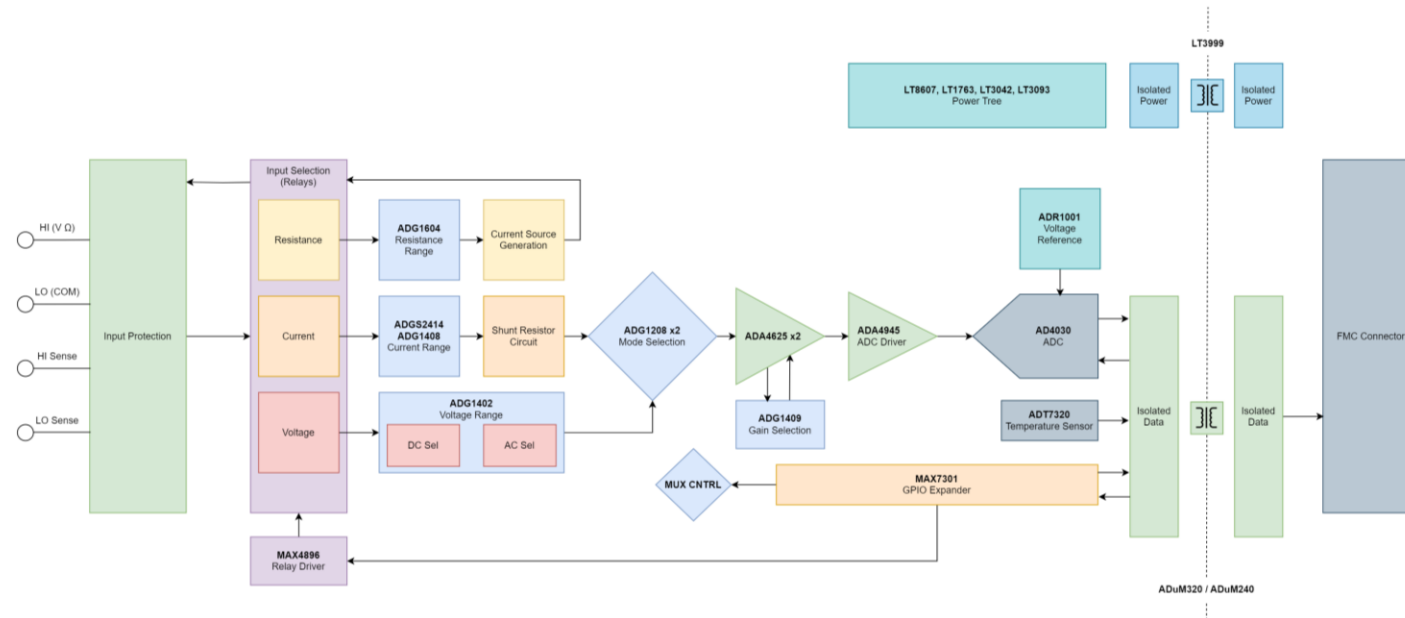
Modular Hardware Design



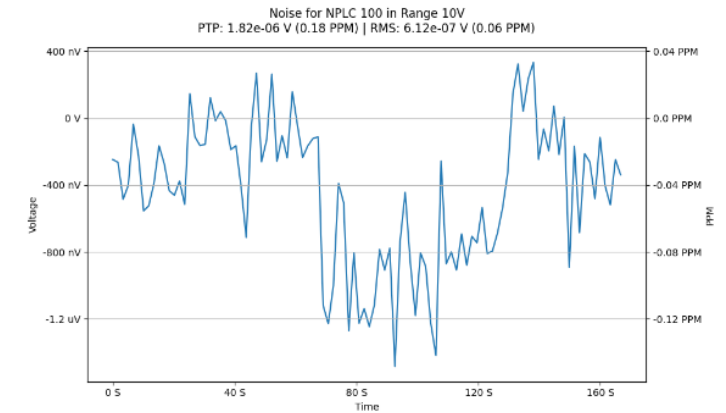
Above: full DMM module
Below: DMM analog tile

ADMX5001

A 7.5-Digit DMM Reference Design



Low Noise Signal Chain
600nV rms using a 10V range (0.06ppm)

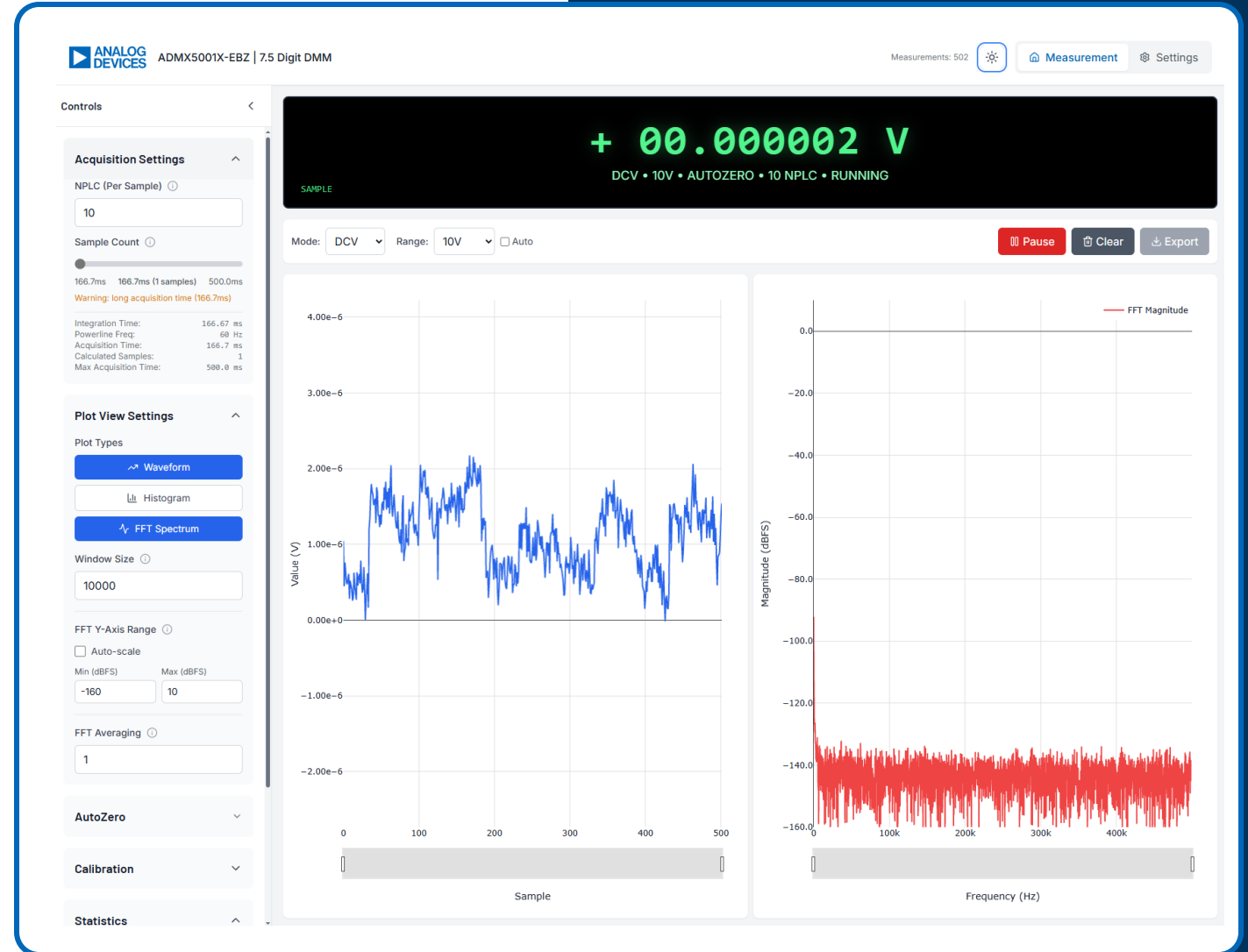


**Utilizes ADI's
Industry-Leading
Precision Products**

- ADC: AD4030-24
- Amplifiers: ADA4625, ADA4945
- Multiplexers: ADG1208, ADG1402, ADG1604
- Voltage reference: ADR1001
- Resistor networks: LT5400
- Temperature sensor: ADT7320
- Data isolator: ADuM320, ADuM240
- Power isolation: LT3999
- Power management: LT8607, LT1763, LT3042, LT3093
- Relay and mux control: MAX4896, MAX7301

Graphical User Interface

- GUI for easy setup and evaluation
- DMM, time domain, histogram, and FFT displays
- View statistics and export data
- Supports high-speed measurements



ADMX6020

1GSPS Digitizer Module

Voltage droop events can lead to significant downtime in data centers

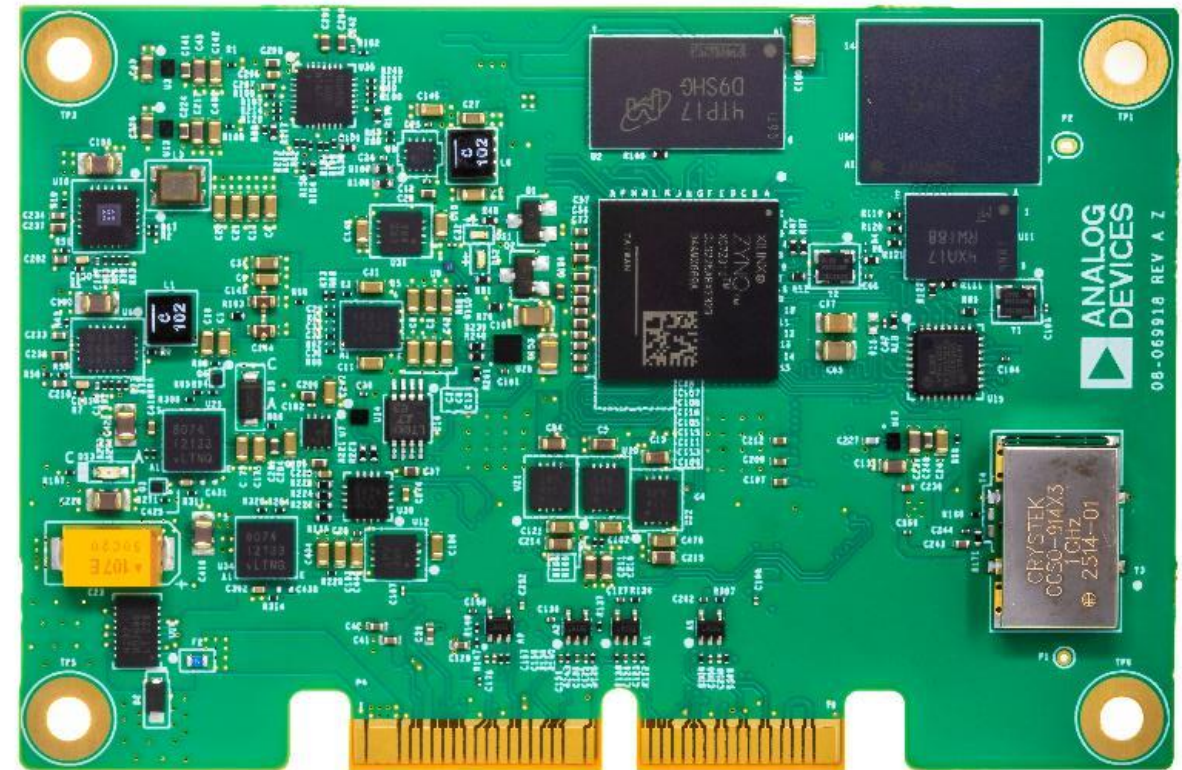
- Monitoring these events can reduce downtime and catastrophic failures

Precision measurements at nanosecond intervals are required

- ADI's diverse portfolio along with domain expertise enables a full system-level solution

Integrated firmware enables storage, voltage triggering, data streaming, and control

Module can be easily integrated into an existing system



ADMX6020

1GSPS Digitizer Module

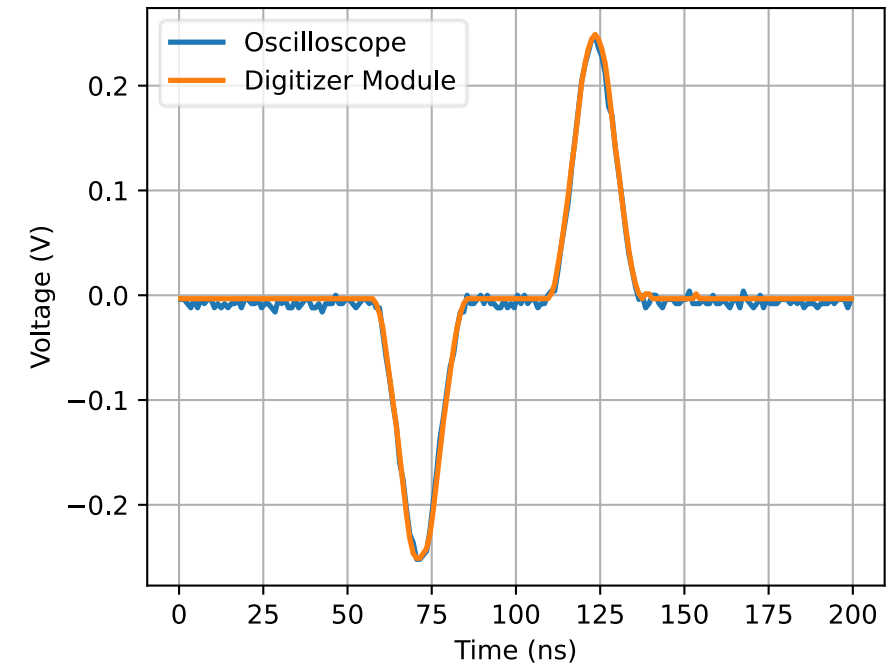
Key Components

- HMCAD1520 ADC
- LTC6409 driver amplifier
- ADF4355 PLL

Key Features

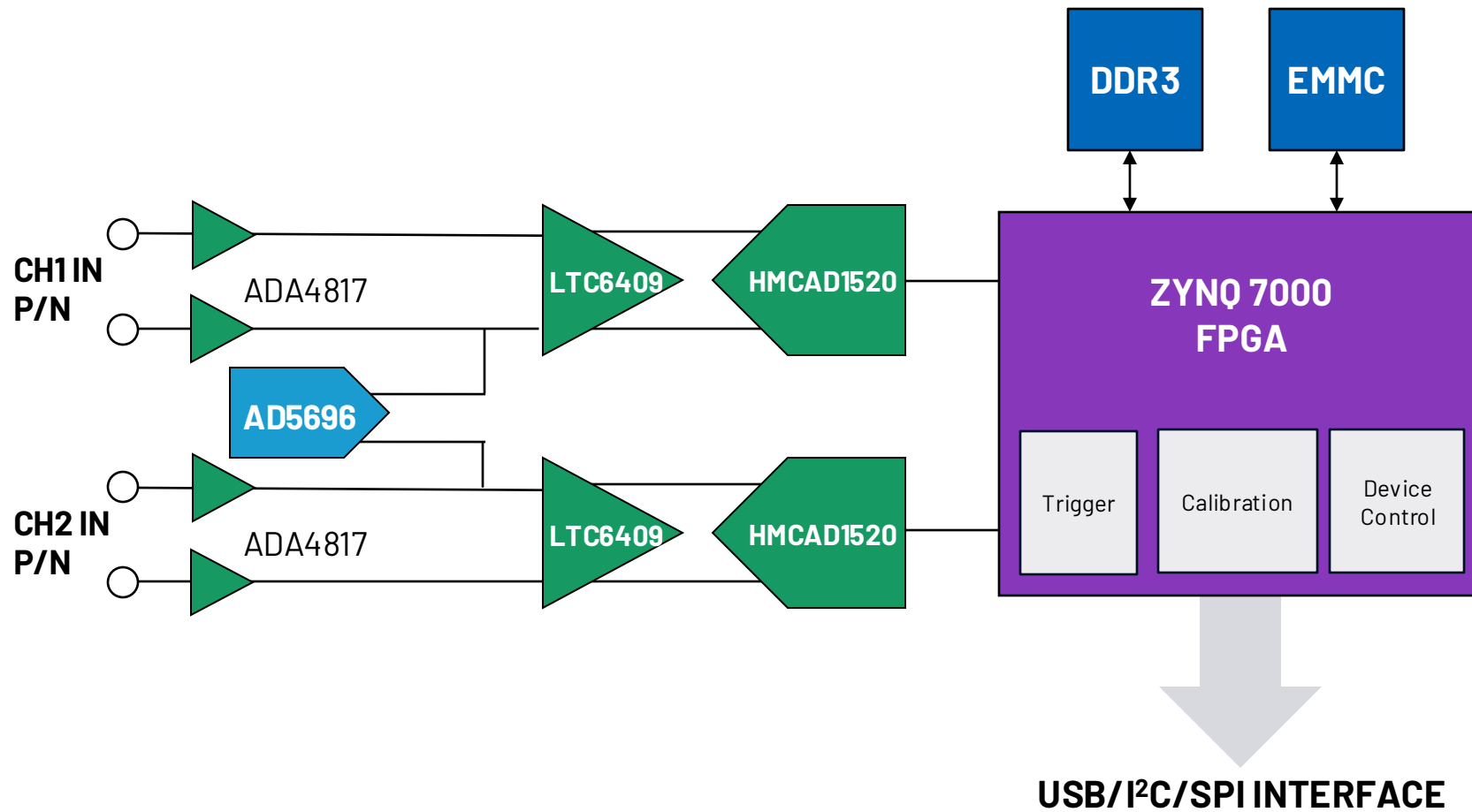
- 1GSPS/8-bit, 640MSPS/12-bit, or 105MSPS/14-bit sampling modes
- Two differential input channels
- 50 Ω input impedance
- 0°C to 85°C (ambient) temperature range
- Adjustable input range
- Built-in non-volatile storage
- Programmable trigger functionality
- SPI, USB, and I²C interfaces for control and data offloading
- Compact size: 3.2" × 2.2" with edge connector for easy integration

High Speed Vdroop Measurement



ADMX6020

System Diagram



AHEAD OF WHAT'S POSSIBLE

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