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Astronics Test Systems
6084-2105
Dual Channel 14-bit Digitizer Module

The Astronics Test Systems™ 6084-2105 Digitizer is a VXI module which is recommended for VXI systems that need either improved accuracy or replacement of an obsolete instrument. It contains two 125 MS/s, 14-bit digitizer channels. The maximum bandwidth for signal acquisition on the lower voltage ranges is 60 MHz and 32 MHz on ranges up to 32 V_{pk-pk}. Maximum input voltage swing is 256 V_{pk-pk}.

Key Features

- **Dual 14-bit digitizers for SE or DIFF operation at sample rates up to 125 MS/s**
- **DC accuracy of 0.15% ± 800 µV on low voltage ranges**
- **SFDR 80 dB at 1 MHz**
- **Wide input ranges from 0.25 V_{pk} to 256 V_{pk}**
- **Performance upgrade or replacement for existing VXI applications**
- **Pre- and post-triggering available**
- **Waveform storage of 32 M samples per channel**

Product Information

Wide Dynamic Range Sampling

The 6084-2105 dual-channel digitizer samples Single-Ended (SE) or Differential (DIFF) waveforms at frequencies of up to 60 MHz and with amplitudes ranging from 250 mV to 256 V.

Powerful Acquisition Engine

The 6084-2105 triggering system supports normal, pre-triggered, and post-triggered (delayed) acquisitions while preserving the 32 Meg/ch of sample memory.

Acquisition may be started in one of the following ways: software trigger, external trigger, or by a positive or negative edge on channel 1 or channel 2.

Superb AC and DC Performance

Despite the wide dynamic operating range, the digitizer delivers impressive DC and AC performance with 0.006% typical relative accuracy and 80 dB SFDR at 1 MHz. All input ranges are fully covered by a programmable offset voltage that makes it possible to zoom in on the required amplitude range with maximum resolution. Measured values are DC accurate to ±1.2 mV at 250 mV_{pk-pk} and ±0.65 V at 256 V_{pk-pk}. At 10 MHz, typical SNR is 62 dB and THD is only 70 dB.

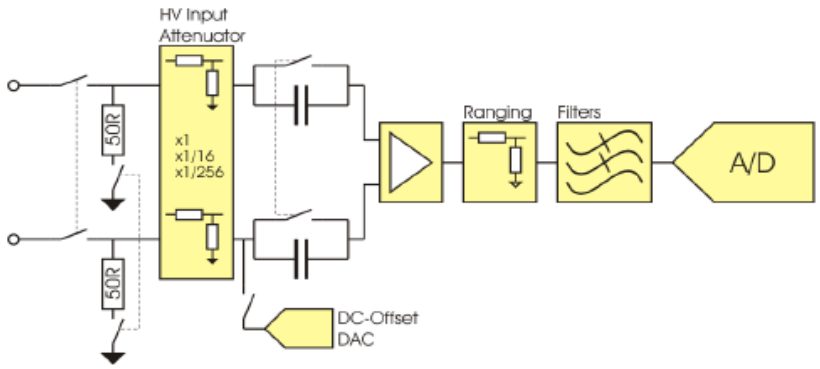
This rare combination of excellent DC and AC performance in one product makes the 2105 useful in applications from device characterization to production test. A built-in high stability voltage source provides the reference for built-in software calibration.

High Performance Upgrade

The 6084-2105 can be used as a high-performance replacement for previous generations of VXI LF digitizers. It offers improved AC and DC performance as well as front-end configurability and flexible triggering.

Software Support

Software control is available from LabVIEW™ or Microsoft C++® and C#® development software environments using the available IVI driver.



Front-end block diagram of a pair 6084-2105 channels

ASTRONICS TEST SYSTEMS

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Specifications

Note: The Astronics Test Systems' policy is one of continuous development and improvement. Consequently, the equipment may vary in detail from the description and specifications in this publication.

Unless specified otherwise, all parameters specified at T_A=25ºC ±3ºC

Digitizer DC Characteristics

Channel Configurations (selectable)

- DIFF: 2 channels
- SE: 2 channels
- Both channels sample simultaneously

Memory Organization

- Memory: 32 M samples/chan

Vertical Resolution

- 14-bits (16 k levels)

Sampling Rate

- External (front panel): 0 Hz to 945 MHz (pre-divider)
- Internal PLL: 1 MHz to 125 MHz

Channel Characteristics

- Range Maximum Voltage/Common Mode Maximum Voltage
  - R1 (0.25 V_{pk-pk} to 2 V_{pk-pk}): ±5 V/±3 V
  - R2 (4 V_{pk-pk} to 32 V_{pk-pk}): ±80 V/±48 V
  - R3 (64 V_{pk-pk} to 256 V_{pk-pk}): ±300 V/±300 V
- Input Voltage Ranges
  - R1: 0.25 V_{pk}, 0.50 V_{pk}, 1.00 V_{pk}, 2.00 V_{pk}
  - R2: 4.00 V_{pk},8.00 V_{pk}, 16.0 V_{pk}, 32.0 V_{pk}
  - R3: 64.0 V_{pk}, 128 V_{pk}, 256 V_{pk}
- Offset Voltage Ranges
  - R1 (0.25 V_{pk-pk} to 2 V_{pk-pk}): ±2.0 V
  - R2 (4 V_{pk-pk} to 32 V_{pk-pk}): ±32 V
  - R3 (64 V_{pk-pk} to 256 V_{pk-pk}): ±512 V
- Coupling: DC or AC (20 Hz min)
- Filters: None, 15 MHz (3-pole), 30 MHz (3-pole), selectable per channel
- Impedance: 1 MΩ or 50 Ω (2 W max), selectable

Absolute Accuracy (INL)

- R1: ±(0.15% of range + 800 µV)
- R2: ±(0.20% of range + 2.5 mV)
- R3: ±(0.25% of range + 10 mV)

Relative Accuracy (DNL)

- ±0.03% (±0.006%, typical)

Offset Voltage Absolute Accuracy (INL)

- ±(0.01% of range + 0.05% of value)

Offset Voltage Relative Accuracy (DNL)

- ±30 ppm of offset range
- ±7.6 ppm of offset range, typical

Offset Voltage Resolution

- 16-bits (64 k levels)

Input Protection

- Temporary input relay disable: Input voltage exceeds ±10 V in 50 Ω mode or in one of the R1 ranges
- Low ranges are protected by a series resistors and clamps
- 500 mA Fuse: Fast-blow

Digitizer AC Characteristics

Signal to Noise Ratio (SNR)

- 2 V_{pk-pk} DIFF (1 MHz): 65 dB, typ
- 2 V_{pk-pk} DIFF (10 MHz): 62 dB, typ

Total Harmonic Distortion (THD)

- 2 V_{pk-pk} DIFF (1 MHz): 77 dB, typ
- 2 V_{pk-pk} DIFF (10 MHz): 70 dB, typ

Spurious Free Dynamic Range (SFDR)

- 2 V_{pk-pk} DIFF (1 MHz): 80 dB, typ

-3 dB Bandwidth (filter bypassed)

- R1 (0.25 V_{pk-pk} to 2 V_{pk-pk}): 60 MHz, min
- R2 (4 V_{pk-pk} to 32 V_{pk-pk}): 30 MHz, min

Clock Characteristics

Sample Clock Source

- Internal PLL
- External Panel Input

  0 V or 1.02 V threshold

  60 mV hysteresis, typ

  Input Impedance: 50 Ω

  Clock Range: 0 Hz to 945 MHz (pre-divider)

Reference Clock Source

- Internal: On-board or 1830 Reference
- External (Shared Input with Sample Clock)

Triggering Characteristics

Trigger Sources

- Software Trigger
- Channel 1 or 2, analog threshold, positive or negative edge
- External Trigger
  - Input Impedance: 10 kΩ, DC coupled
  - Threshold: 1.02 V ± 5%
  - Hysteresis: 60 mV, typical

Trigger Modes

- Normal: Sampling synchronized with trigger
- Pre-Triggered: Sampling synchronized with 1 to 4 G counts before trigger
- Post-Triggered: Sampling synchronized with 1 to 4 G counts after trigger

Trigger Delay Counter Range

- 1 to 4 G sample clock counts

Module Interface

Drivers

- IVI-C, IVI-COM

Native Language

- SCPI

Front Panel I/O (Dual or Quad Channel)

- Channel Input (4 Dual, 8 Quad): SMA, 1 MΩ or 50 Ω
- Clock Input (1 Dual, 2, Quad): SMB, 50 Ω, 0 or 1.02 V threshold
- External Trigger Input (1 Dual, 2, Quad): SMB, 10 kΩ, 1.02 V threshold, 60 mV hysteresis

Environmental

Temperature

- Operating: 0° C to 50° C
- Storage: -40° C to 70° C

Humidity (non-condensing)

- 11° C to 30° C: 95% ±5%
- 31° C to 40° C: 75% ±5%
- 41° C to 50° C: 45% ±5%

EMC (Council Directive 89/336/EEC)

- Emission: EN61326-1:1997 +A1:1998,Class B
- Immunity: EN61326-1:1997 +A1:1998,Table 1

Safety (Low Voltage Directive 73/23/EEC)

- BS EN61010-1:1993/A2 1995

Ordering Information

408646 : Astronics Test Systems™ 6084-2105

Dual Channel VXI Digitizer Module

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