

Diamond_x MultiWave

Highly Integrated Mixed-Signal Instrument for Multisite and Concurrent Testing



The MultiWave is a highly integrated mixed signal instrument that combines analog source and capture capability for testing audio, video, baseband and automotive devices.

Highlights

- Wide bandwidth analog source
- Wide bandwidth analog capture
- Flexible triggering
- High-precision PMU
- Protected I/O channels
- Simpler test boards
- Mixed-signal software support

Features

- Single powerful instrument offers fully parallel quad-channel source and capture capability
- Multi-band performance is ideal for numerous application types such as audio, video, automotive and baseband
- Flexible trigger modes enable synchronization between digital and analog channels
- Each channel has an independently programmable high-speed or high-resolution path and selectable filters for efficient parallel or concurrent test
- A PMU per channel enables high precision parallel DC measurements



Automotive



Power Management



Flat Panel Display



IoT/IoV & Optoelectronics



Industrial & Medical



MCU



Mobility

- 4 AWG Channels
- 4 Digitizer Channels

- High Precision Audio
- High Frequency Video

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Wide Bandwidth Analog Source

The MultiWave has four independent generator channels that enable the test engineer to select either a high resolution path or a high-frequency path. Sampling rates range from 0 to 250 MS/s. The 24-bit high-resolution mode is ideally suited for audio testing, while the 16-bit high frequency mode is well suited for video and broadband testing. Built-in programmable filters are targeted at common application frequencies and eliminate the need for external circuitry on the load board.

Wide Bandwidth Analog Capture

Each MultiWave instrument has four independent digitizer channels. Like the generator channels, each digitizer enables selection of either a 24-bit high-resolution path or a 16-bit high-frequency path. Sampling rates range from 90 to 250 MS/s. Built-in programmable filters are available to address common applications.

Flexible Triggering

Flexible trigger routing with 10 trigger inputs and 10 trigger outputs per instrument allows event synchronization with other Diamond Series instruments and the digital sequencer. Not only can events be timed precisely, but test throughput is improved by allowing the hardware to manage the triggering so the software can be free to perform other task.

Using the MultiWave can significantly lower your cost of test. Four channels of analog source and four channels of analog capture on each instrument make it ideal for multisite and concurrent testing.

High-Precision PMU

Each MultiWave channel includes a high-precision Kelvin PMU for parallel DC parametric tests. The PMU voltage force and measure operation has a range of -4 V to +14 V. The current force and measure operations have five separate ranges from a low 2 μ A range to a high 25 mA range.

Protected I/O Channels

The overvoltage/overcurrent protection for all I/O channels protects the tester hardware and devices. This is essential for all semiconductor tests dealing with higher device voltages, such as the voltages encountered in automotive test.

Simpler Load boards

The built-in filters and per-pin PMU's mean that the user doesn't have to put relays and external circuitry on the load board. The flexible programmability of the MultiWave takes care of the majority of test and applications needs, so the user does not have to.

Mixed-Signal Software Support

The Diamond Series offers a full suite of software tools for test creation, debug, characterization and high-volume production. For mixed-signal testing, an extension library of DSP functions is available for waveform transformation and analysis. The Analog Wavetool (AWT) is a powerful graphical environment for viewing, debugging and creating waveforms, and DSP functions can be used interactively in AWT to manipulate and analyze analog signals.

- 4 AWG Channels
- 4 Digitizer Channels
- High Precision Audio
- High Frequency Video

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Specifications

High-Precision AWG

- Number of AWGs: 4 per unit
- Sample Rate: 16 ks/s to 768 ks/s
- Bandwidth: >500 kHz
- Resolution: 24 bit
- Output Ranges: ± 1.25 V to ± 10 V
- Low Pass Filter: Selectable
- AC Performance:
 - THD: -110 dB typ @ 1 kHz
 - SFDR: 115 dB typ @ 1 kHz

High-Speed AWG

- Number of AWGs: 4 per unit
- Sample Rate: 0 MS/s to 250 MS/s
- Bandwidth: >100 kHz
- Resolution: 16 bit
- Output Ranges: ± 0.5 V to ± 4 V
- Low Pass Filter: Selectable
- AC Performance:
 - THD: -92 dB typ @ 1 kHz
 - SFDR: 90 dB typ @ 1 kHz
 - SNR: 80 dB typ @ 1 kHz

High Resolution Digitizer

- Number of Digitizers: 4 per unit
- Sample Rate: 48 kS/s to 2.5 MS/s
- Bandwidth: >500 kHz
- Resolution: 24 bit
- Output Ranges: ± 1.25 V to ± 10 V
- Low Pass Filter: Selectable
- AC Performance:
 - THD: -98 dB typ @ 1 kHz
 - SFDR: 115 dB typ @ 1 kHz
 - SNR: 106 dB typ @ 1 kHz

High-Speed Digitizer

- Number of Digitizers: 4 per unit
- Sample Rate: 1 MS/s to 130 MS/s
- Bandwidth: >100 kHz
- Resolution: 16 bit
- Output Ranges: ± 0.5 V to ± 3.3 V
- Low Pass Filter: Selectable
- AC Performance:
 - THD: -92 dB typ @ 1 kHz
 - SFDR: 90 dB typ @ 1 kHz
 - SNR: 75 dB typ @ 1 kHz

PMU Data

- PMU Channels/Unit: 8, shared between differential P and N nodes
- Kelvin Force/Sense Connections: All channels

Mode	Range	Resolution	Accuracy
Voltage	-4 to + 14 V	16 bit	$\pm(0.1\% + 5 \text{ mV})$
Current Force	$\pm 2 \mu\text{A}$	16 bit	$\pm(0.1\% + 10 \text{ nA})$
	$\pm 20 \mu\text{A}$	16 bit	$\pm(0.1\% \text{ to } 100 \text{ nA})$
	$\pm 200 \mu\text{A}$	16 bit	$\pm(0.1\% \text{ to } 1 \mu\text{A})$
	$\pm 2 \text{ mA}$	16 bit	$\pm(0.1\% \text{ to } 10 \mu\text{A})$
	$\pm 25 \text{ mA}$	16 bit	$\pm(0.1\% \text{ to } 100 \mu\text{A})$
Voltage Measurement	-4 to + 14 V	16 bit	$\pm(0.1\% + 5 \text{ mV})$
Current Measurement	$2 \mu\text{A}$	16 bit	$\pm(0.1\% \text{ to } 10 \text{ nA})$
	$\pm 20 \mu\text{A}$	16 bit	$\pm(0.1\% \text{ to } 100 \text{ nA})$
	$\pm 200 \mu\text{A}$	16 bit	$\pm(0.1\% \text{ to } 1 \mu\text{A})$
	$\pm 2 \text{ mA}$	16 bit	$\pm(0.1\% \text{ to } 10 \mu\text{A})$
	$\pm 25 \text{ mA}$	16 bit	$\pm(0.1\% \text{ to } 100 \mu\text{A})$

All specifications are subject to change without notification and are for reference only. For detailed performance specifications, please contact Cohu.