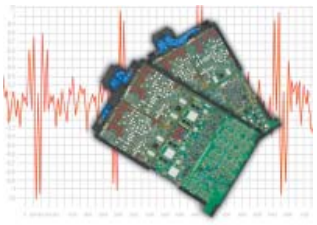
datasheet

QBIX™

credence Sapphire™



Bi-directional mixed-signal I/O for multi-site test

The ***Credence QBIX*** instrument for Sapphire provides four fully independent analog channels, each configurable on-the-fly as a source or measurement resource, selectable for high accuracy or high frequency requirements.

credence

QBIX for Sapphire

Bi-directional mixed-signal I/O for multi-site test

features

- Industry's first integrated analog I/O pin architecture
- Performs up to four analog tests in parallel on one instrument for multi-site or multi-core testing
- Each channel configurable on-the-fly as source or measure test resource
- Each channel configurable on-the-fly as high-accuracy or high-frequency test resource
- Analog sequencer-per-channel for flexibility to test multi-functional mixed-signal devices in a single pass
- Direct DAC/ADC access for extended performance
- Per-pin PMU for single-pass DC parametric and continuity tests on analog pins
- Per-instrument PMU for high accuracy DC parametrics
- Per-instrument TMU for frequency and period measurements

summary

Increasing Mixed-Signal Test Demands

Today's mixed-signal SoC test demands are too extensive to be covered by single analog source and measure instrument pairs. In traditional ATE, this has forced the use of multiple instruments to cover a broad range of test requirements, which reduces digital pin count and drives up cost. Weak integration between multiple instruments has resulted in long test times, test sequence inflexibility, and limited resolution and accuracy.

Complex mixed-signal SoC devices today have multiple analog I/O ports on the same device, each having differing bits of resolution and sample rates. Test cost constraints are increasing demands for higher test parallelism and multi-site testing. Rather than being an after-thought as in most ATE systems, analog test resources have to be designed to meet these demands for capability, flexibility and parallelism.

Optimum Performance: DC to Broadband

The Credence QBIX (quad broadband integrated xceiver) is the ideal solution for testing a wide range of complex SoC devices. Applications include set-top box, DVD, DTV, audio/visual DAC/ADCs, xDSL, IF, and cellular baseband. The QBIX instrument for Sapphire provides four fully independent analog channels, each configurable as a source or measurement resource. Each channel can also be dynamically switched within a test program to use high resolution or high frequency converters and filters for optimum performance from DC to broadband frequencies. With on-the-fly switching from source to measure and high frequency to high resolution, one QBIX instrument has the flexibility to replace up to eight separate analog instruments as found on a traditional ATE system.

A selection of passive and active filters is provided to optimize performance within specific frequency ranges. The QBIX instrument also offers programmable digital filters, which provide greater flexibility and can optimize test throughput by reducing capture buffer sizes, shortening data transfer times. The filter and amplifier chain can be bypassed to offer extended performance for some applications.

Bi-Directional, Independent Channels, On-the-Fly Switching

QBIX provides higher throughput and superior test coverage by combining independent, per-channel analog sequencers with multiple clocking options and flexible, digitized analog capabilities.

The four flexible integrated channels provide:

- Up to four analog tests performed simultaneously for parallel or multi-site testing
- Per-channel converter capability switchable on-the-fly
- Four switchable connection paths to the device-under-test (DUT) per channel, allowing multiple ports to be tested without additional load board circuitry

Unmatched Synchronization Flexibility

QBIX offers both synchronous and asynchronous triggering. Picosecond synchronization is possible through the Credence Sapphire Isochronous Fabric Interface™ bus. This is ideal for accurate, high frequency triggering requirements. Triggering is also possible via load board connections to the DUT pins.

Each QBIX channel digitally generates its own test period, which can be phase-locked to the digital subsystem for coherent sampling of A-to-D and D-to-A converters. Alternatively, a low-jitter analog clock can be used for precise frequency matching or high-performance dynamic testing.

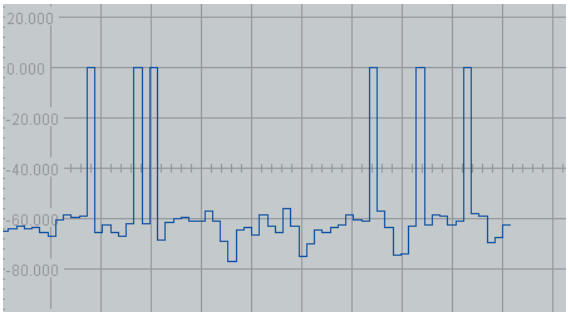
At the start of testing it is common to perform continuity tests on all device pins. In the past, this required the addition of expensive digital ATE resources in order to perform this simple test on analog device pins. Every QBIX I/O port is provided with a per-pin-PMU so that analog DUT pins can be tested for shorts and opens in parallel with digital device pins, without additional resources.

Any Test Head Slot, On-Board Diagnostics

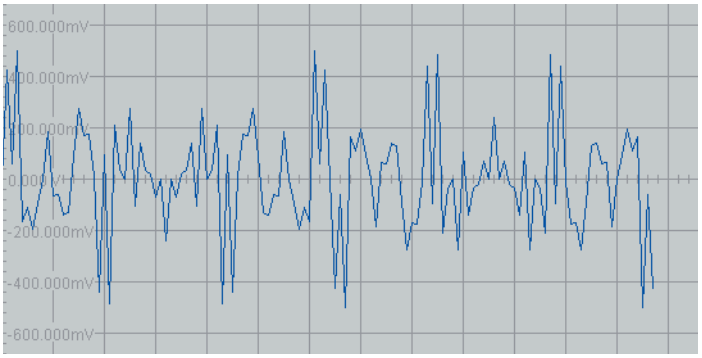
Like other Sapphire instruments, QBIX instruments can be placed in any test head slot, providing complete calibration flexibility. The on-board calibration and diagnostics metrology enables the parallel calibration of multiple instruments in the system, for increased system availability. The per-instrument metrology resources are also available to the user for extended test coverage on analog device pins, including an extended-range PMU and a TMU for measuring frequency or period.

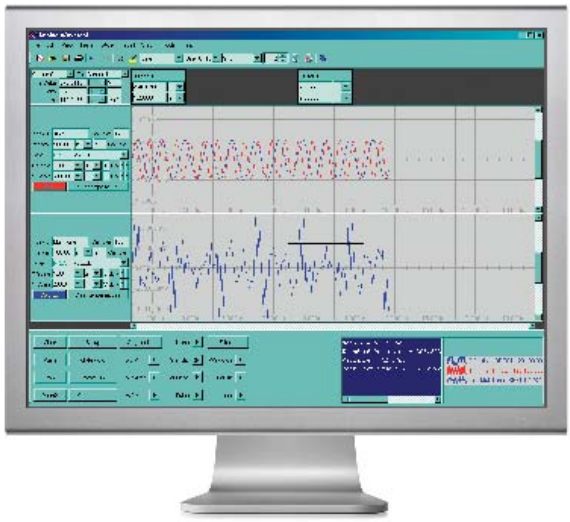
The power of QBIX, and all the other Sapphire instruments, is accessed through the XTOS™ software environment and the extensive integrated DSP library. Mixed-signal waveforms can be created, displayed, and manipulated with the Analog Wave Tool, and instrument setups can be quickly validated in a debug environment using hardware viewers.

Multitone – *Spectrum*



Multitone – *Time Domain*





Above: *Integrated XTOS Data Analysis Tools.*

specifications

General

Number of channels:	4
Number of I/O paths per channel:	Four single-ended or two differential
Configurations supported per channel:	High accuracy source, high accuracy measure, high frequency source, high frequency measure, switchable on-the-fly

Clocking and Triggering

Tz clock generators:	4 (one per channel)
Analog clock generators:	One per instrument, shared across four channels with per-channel dividers
Trigger inputs:	IFI bus, load board pogos, one per channel

DC Parameters

Maximum voltage level, high accuracy mode:	+8 V / -6 V
Maximum voltage level, high frequency mode:	+4 V / -2 V

AC Parameters

High accuracy source resolution and sampling frequency:	24 bits @ 216 ksps
High accuracy measure resolution and sampling frequency:	18 bits @ 570 ksps
High frequency source resolution and sampling frequency:	16 bits @ 400 Msps
High frequency measure resolution and sampling frequency	14 bits @ 105 Msps

High accuracy filters:	1 kHz, 20 kHz, 1 kHz notch (measure only), bypass
High frequency filters:	1.1 MHz, 4 MHz, 8 MHz, 16 MHz, 32 MHz, 74 MHz, bypass

	SFDR	SNR	THD	Ft
High Accuracy Source:	126 dB	107 dB	-121 dB	0-1 kHz
High Accuracy Measure:	122 dB	108 dB	-112 dB	0-1 kHz
High Frequency Source:	91 dB	80 dB	-87 dB	0-1 MHz
High Frequency Measure:	91 dB	80 dB	-87 dB	0-1 MHz

Noise Floor: -150 dBFS/Hz

Note: Typical performance using differential signal path.

**All specifications subject to change without notice.*

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