

Keysight Synthetic Instruments

N8201A 26.5 GHz performance downconverter SI module
N8211A 20/40 GHz performance analog upconverter SI module
N8212A 20 GHz performance vector upconverter SI module
N8221A 30 MS/s IF digitizer SI module
N8241A arbitrary waveform generator SI module

- Provides obsolescence protection of automated test systems (ATS) by providing the longest future support life architecture, reducing the lifetime cost of ownership
- Morphable modules enable the design of scalable systems, and provide the flexibility to insert technology to accommodate future measurement applications
- LXI interface compliance provides computer interface longevity
- Offers the industry's highest RF/MW performance and smallest footprint for ATS



Highest-performing LAN-based synthetic instruments link individual hardware and software test modules together to emulate standard test instruments in a new compact form factor.

Flexible, Modular, and Morphable Instrumentation

Synthetic instrumentation and the LXI interface standard are a new concept for automated test systems that provide maximum flexibility, and minimize the cost of the system over its lifetime. The concept breaks the measurement instrumentation down into its most basic functional components, and uses basic modules as building blocks for synthesizing a variety of different measurements. Software modules are used to make many different measurement functions from a few common hardware modules.

Performance Characteristics (preliminary)¹

N8201A 26.5 GHz Performance Downconverter SI Module

- Frequency range: 3 Hz to 26.5 GHz standard
- Frequency range extension: Up to 110 GHz with optional external mixing
- Amplitude input range: -70 to +30 dBm
- Residual response: -100 dBm (nominal)

N8211A 20/40 GHz Performance Analog Upconverter SI Module

N8212A 20 GHz Performance Vector Upconverter SI Module

- Frequency range: 250 kHz to 20 GHz or 250 kHz to 40 GHz (for N8211A)
- Sweep types: CW, digital step, or analog ramp
- Number of points: 2 to 65535, or 2 to 1601 per table
- Triggering: Auto, external, single, LAN, or trigger bus
- Output power: -20 to +13 dBm typical (for 250 kHz to 20 GHz)
-20 to +9 dBm typical (for 250 kHz to 40 GHz)
- Step attenuator: (Option 1E1) decreases output power by typically 2 dB
- Narrow pulse: (Option UNW) decreases output power by typically 3 dB
- High power: (Option 1EA) increases output power by typically 5 dB
- Step attenuator range: 0 dB and 5 to 115 dB in 10 dB steps
- Power level accuracy²: ±0.6 dB to ±1.0 dB
- Leveling modes: Internal and external detector
- Spectral purity: < -55 dBc typical (2 to 20 GHz) < -40 dBc typical|
(20 to 40 GHz)
- FM modulation bandwidth: DC to 1 MHz (typical)
- AM modulation bandwidth: DC coupled, 0 to 100 kHz AC coupled, 10 Hz to 100 kHz,
usable to 1 MHz
- Phase modulation: 10 to 320 radians, normal bandwidth mode 1 to 32 radians,
high bandwidth mode
- Pulse modulation³:
- On/off ratio: 80 dB
- Rise/fall times: 6 ns (typical)
- Minimum pulse width: 0.5 μs (typical)
- Pulse repetition frequency: DC to 1 MHz
- Pulse modulation level accuracy: ±0.5 dB

N8221A 30 MS/s IF Digitizer SI Module

- 7.5 MHz IF input frequency – 30 MS/s sample clock
- 10 MHz bandwidth – 80 dB dynamic range (14 bits)

N8241A 1.25 GS/s Arbitrary Waveform Generator

- 1.25 GHz sample clock
- 15 bits of vertical resolution
- Dual channel operation
- Differential and single-ended outputs
- Up to 16 MS waveform memory (optional)
- Multiple module synchronization
- Up to 125 k definable waveform segments
- Up to 16 k unique definable sequences
- Remote programming interface: LAN IEEE 1588 over 100Base-T LAN
- Full environmental specifications

1. This is a brief summary of the preliminary specifications. Complete specifications will be available in the product data sheets.
2. Dependent on frequency and power level range.
3. For frequencies above 3.2 GHz.

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