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Data Sheet

August 13, 2026

STANFORD RESEARCH SYSTEMS

Stanford Research SG394 4 GHz Vector Generator

Stanford Research Systems SG394 4 GHz Vector Signal Generator The SRS SG394 is the 4 GHz member of the SG390 Series vector signal generators. Rational Approximation Frequency Synthesis (RAFS) provides 1 uHz frequency resolution and analog plus vector modulation. A front-panel BNC covers DC to 62.5 MHz; the N-type output covers 950 kHz to 4.05 GHz. Built-in dual 14-bit 125 MS/s baseband generators support PSK, QAM, FSK, CPM, MSK, ASK, and VSB on carriers from 400 MHz to 4.05 GHz. RF and IF stimulus for communications and radar test; vector-modulated carriers for GSM, W-CDMA, APCO-25, DECT, TETRA, and ATSC DTV presets; analog AM/FM/phase/pulse test; LO and clock generation to 4 GHz; automated ATE via GPIB, Ethernet, and RS-232. The SRS SG394 is the 4 GHz member of the SG390 Series vector signal generators. Rational Approximation Frequency Synthesis (RAFS) provides 1 uHz frequency resolution and analog plus vector modulation. A front-panel BNC covers DC to 62.5 MHz; the N-type output covers 950 kHz to 4.05 GHz. Built-in dual 14-bit 125 MS/s baseband generators support PSK, QAM, FSK, CPM, MSK, ASK, and VSB on carriers from 400 MHz to 4.05 GHz. RF and IF stimulus for communications and radar test; vector-modulated carriers for GSM, W-CDMA, APCO-25, DECT, TETRA, and ATSC DTV presets; analog AM/FM/phase/pulse test; LO and clock generation to 4 GHz; automated ATE via GPIB, Ethernet, a



MODEL	CALIBRATION
Stanford Research Systems SG394	Available on request
CONDITION	STATUS
Used	In stock
RFQ / SKU	LISTING
SG394	https://aumictechlabs.com/products/sg394-2/

NIST-traceable cal

SAM registered

30-day returns

NAICS 423690 · 811210 · 541380

This unit

The Stanford Research Systems SG394 is a 4 GHz vector signal generator engineered for RF and microwave applications demanding precision synthesis, low phase noise, and flexible modulation. Built on Rational Approximation Frequency Synthesis (RAFS), the SG394 delivers spur-free outputs across 400 MHz to 4.05 GHz with 1 μ Hz frequency resolution and -116 dBc/Hz phase noise at 20 kHz offset (1 GHz). The instrument combines analog modulation (AM, FM, Φ M, pulse) with standard vector modulation supporting ASK, FSK, MSK, PSK, QAM, VSB, and custom I/Q schemes. Its dual 14-bit arbitrary waveform generators operate at 125 MS/s with symbol rates to 6 MHz, enabling modulation bandwidths of 300 MHz RF and analog modulation bandwidth exceeding 100 kHz. The baseband architecture includes raised cosine and root-raised cosine pulse shaping, Gaussian and user-defined FIR filters, and preset modes for GSM, EDGE, W-CDMA, APCO-25, DECT, NADC, PDC, ATSC-DTV, and TETRA. An ovenized SC-cut crystal oscillator (OCXO) timebase is standard; a rubidium oscillator option reduces aging and improves temperature stability. Vector modulation uses rear-panel I/Q inputs (± 0.5 V, 50 Ω) with carrier suppression exceeding 40 dBc, while amplitude control spans +25 dB gain to -130 dB attenuation in 156 steps with 0.01 dB resolution. The SG394 accepts external 10 MHz timebase references and supports digital data playback with symbol constellation mapping, making it suitable for development, validation, and production testing across communication standards and custom waveform applications.

Technical Specifications

Frequency range: 400 MHz to 4.05 GHz (N-type output)
Frequency resolution: 1 μ Hz
BNC output (modulation): DC to 62.5 MHz
SSB phase noise: -116 dBc/Hz at 20 kHz offset (1 GHz)
Carrier suppression: >40 dBc (>35 dBc above 4 GHz)
I/Q input offset: 100 kHz
Modulation bandwidth (vector): 300 MHz
RF Baseband DAC: Dual 14-bit at 125 MS/s
Reconstruction filter: 10 MHz, 3rd order Bessel LPF
Symbol rates: Up to 6 MHz
I/Q full scale input: $(I^2 + Q^2)^{1/2} = 0.5$ V
Amplitude modulation range: 0 to 100%
Amplitude modulation resolution: 0.1%
AM distortion: <1% ($f_c < 62.5$ MHz, $f_m = 1$ kHz); 62.5 MHz, $f_m = 1$ kHz)
Amplitude control: +25 dB gain to -130 dB attenuation (156 steps)
Amplitude resolution: 0.01 dB

Key Features

Rational Approximation Frequency Synthesis (RAFS) for spur-free outputs
Standard OCXO timebase with optional rubidium oscillator (Option 04)
External 10 MHz timebase reference input
Dual arbitrary waveform generators with I and Q channels
Pulse shaping: raised cosine, root-raised cosine, Gaussian, rectangular, triangular, user-defined FIR
Modulation modes: AM, FM, Φ M, pulse, vector (ASK, FSK, MSK, PSK, QAM, VSB, custom I/Q)
Preset modulation: GSM, EDGE, W-CDMA, APCO-25, DECT, NADC, PDC, ATSC-DTV, TETRA
Internal modulation sources: sine, ramp, sawtooth, square, noise waveforms
Digital data playback with symbol constellation mapping

Typical Applications

Communication standards validation and testing
Custom waveform development and characterization
Receiver and transceiver bench testing
Production test and alignment

Compatibility & Integration

N-type RF output connector
Rear-panel BNC modulation inputs (external AM, FM, Φ M, pulse)
Rear-panel I/Q inputs (± 0.5 V, 50 Ω)
External timebase reference: 10 MHz input (rear panel)

Features & description

From manufacturer datasheet

Features

- Dual front-panel outputs: BNC (DC to 62.5 MHz) and N-type (950 kHz to 4.05 GHz) • Internal analog modulation plus dual-channel vector I/Q baseband generator • Vector types include PSK, QAM 4 to 256, FSK, CPM, MSK, ASK, 8 VSB, and 16 VSB • Pulse-shaping filters: raised cosine, root-raised cosine, Nyquist, Gaussian, rectangular, linear, sinc, and user FIR • Additive white Gaussian noise impairments from -70 dBc to -10 dBc • Standard OCXO timebase; optional rubidium (Opt. 04)

SG394 Characteristics / Specifications

PARAMETER	VALUE
Model	SG394
Manufacturer	Stanford Research Systems
Instrument Type	Vector Signal Generator
Series	SG390
Alias	SG394; SRS SG394
Synthesis Method	Rational Approximation Frequency Synthesis (RAFS)
BNC Output Frequency Range	DC to 62.5 MHzNType Output Frequency Range: 950 kHz to 4.05 GHz
Frequency Resolution	1 uHz at any frequency
Switching Speed	less than 8 ms (to within 1 ppm)
Frequency Error	less than (1e-18 + timebase error) times carrier frequency
Frequency Stability	1e-11 (1 s Allan variance)
BNC Amplitude Range	1.00 Vrms to 0.001 Vrms
BNC Offset Range	+/-1.5 VDC
BNC Offset Resolution	5 mV
BNC Maximum Excursion	1.817 V (amplitude plus offset)
BNC Amplitude Accuracy	+/-5 %
BNC Harmonics	less than -40 dBc
BNC Spurious	less than -75 dBc
BNC Output Coupling	DC, 50 ohm +/-2 %
N Type Power Range	+16.5 dBm to -110 dBm (below 3 GHz)
N Type Voltage Range	1.5 Vrms to 0.7 uVrms (below 3 GHz)
Power Resolution	0.01 dBm
Power Accuracy	+/-1 dBNType Output Coupling: AC, 50 ohm
User Load Impedance	50 ohm
Output VSWR	less than 1.6

PARAMETER	VALUE
Reverse ProtectionNType	30 VDC, +25 dBm RF
RF Harmonics	less than -25 dBc (below +7 dBm, N-type)
Close In Spurious	less than -65 dBc (offset below 10 kHz)
Far Spurious	less than -75 dBc (offset above 10 kHz)
Phase Noise at Ten Hz	-80 dBc/Hz typical (referenced to 1 GHz)
Phase Noise at One kHz	-102 dBc/Hz typical (referenced to 1 GHz)
Phase Noise at Twenty kHz	-116 dBc/Hz typical (SG392 and SG394, 1 GHz)
Phase Noise at One MHz	-130 dBc/Hz typical (SG392 and SG394, 1 GHz)
Residual FM	1 Hz rms typical (300 Hz to 3 kHz BW)
Residual AM	0.006 % rms typical (300 Hz to 3 kHz BW)
OCXO Stability	less than +/-0.002 ppm (0 to 45 C)
OCXO Aging	less than +/-0.05 ppm/year
Rubidium Option Stability	less than +/-0.0001 ppm (0 to 45 C, Opt. 04)
Rubidium Option Aging	less than +/-0.001 ppm/year (Opt. 04)
Vector Carrier Frequency Range	400 MHz to 4.05 GHz
External IQ Input Impedance	50 ohm, +/-0.5 V (rear panel)
IQ Modulation Bandwidth	300 MHz RF bandwidth
IQ Input Offset	less than 500 uV
Carrier Suppression	greater than 40 dBc (up to 4 GHz)
Baseband DAC Format	dual 14-bit at 125 MS/s
Arb Symbol Memory	up to 16 Mbits
Symbol Rate Range	1 Hz to 6 MHz (1 uHz resolution)
PRBS Length	2^n - 1 (5 less thanless than 32)
AM Modulation Range	0 to 100 % (decreases above +7 dBm)
Pulse On Off RatioNType	57 dB at or below 1 GHz; 40 dB from 1 GHz to 4 GHz
Interfaces	Ethernet 10/100 Base-T; GPIB IEEE-488.2; RS-232 4800 to 115200 baud
Line Power	less than 90 W, 90 to 264 VAC, 47 to 63 Hz with PFC

PARAMETER	VALUE
Dimensions	8.5 in x 3.5 in x 13 in (WHD)
Weight	10 lbs
Stored Configurations	9 instrument setups in non-volatile memory Notes Specs from SRS SG390 Series catalog and SG390 user manual. Confirm installed Opt. 04 rubidium timebase and vector firmware on the option label. Analog SG380 models (SG382/SG384/SG386) do not include the built-in dual baseband generator.
Dual front-panel outputs	BNC (DC to 62.5 MHz) and N-type (950 kHz to 4.05 GHz)
Pulse-shaping filters	raised cosine, root-raised cosine, Nyquist, Gaussian, rectangular, linear, sinc, and user FIR
Bandwidth	300 MHz RF bandwidth

Full OEM specifications

Complete technical content extracted from the manufacturer datasheet. Sparse OEM tables are reconstructed as tables below; other text is preserved as paragraphs.

Specifications	
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Model	SG394
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Switching Speed	less than 8 ms (to within 1 ppm)
Frequency Error	less than (1e-18 + timebase error) times carrier frequency
Frequency Stability	1e-11 (1 s Allan variance)
BNC Amplitude Range	1.00 Vrms to 0.001 Vrms
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BNC Maximum Excursion	1.817 V (amplitude plus offset)
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Power Resolution	0.01 dBm
Power Accuracy	+/-1 dB
N Type Output Coupling	AC, 50 ohm
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Rubidium Option Aging	less than +/-0.001 ppm/year (Opt. 04)
Vector Carrier Frequency Range	400 MHz to 4.05 GHz
External IQ Input Impedance	50 ohm, +/-0.5 V (rear panel)
IQ Modulation Bandwidth	300 MHz RF bandwidth
IQ Input Offset	less than 500 uV
Carrier Suppression	greater than 40 dBc (up to 4 GHz)
Baseband DAC Format	dual 14-bit at 125 MS/s
Arb Symbol Memory	up to 16 Mbits
Symbol Rate Range	1 Hz to 6 MHz (1 uHz resolution)
PRBS Length	$2^n - 1$ (5 less than n less than 32)
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Rubidium Option Aging	less than +/-0.001 ppm/year (Opt. 04)
Vector Carrier Frequency Range	400 MHz to 4.05 GHz
External IQ Input Impedance	50 ohm, +/-0.5 V (rear panel)
IQ Modulation Bandwidth	300 MHz RF bandwidth
IQ Input Offset	less than 500 uV
Carrier Suppression	greater than 40 dBc (up to 4 GHz)
Baseband DAC Format	dual 14-bit at 125 MS/s
Arb Symbol Memory	up to 16 Mbits
Symbol Rate Range	1 Hz to 6 MHz (1 uHz resolution)
PRBS Length	$2^n - 1$ (5 less than less than 32)
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Available from Aumictech

Used and refurbished unit evaluated in-house. Calibration: Available on request. Used · In stock.

Request a quote: sales@aumictech.com · +1 (484) 841-9341

Aumictech

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Technical content from manufacturer specifications. Unit photo/stock from Aumictech listing when available. Specifications subject to OEM documentation and unit condition.