

10 GHz Signal Source for PXI Express

The SC5502A is a 2-slot, 3U, PXI Express, 50 MHz to 10 GHz synthesized signal source. Designed as an instrument grade RF/microwave CW source, and to meet demanding low phase noise applications, the SC5502A employs a multiple phase-locked loop architecture as well as a YIG oscillator as the heart of its synthesizer. It also has an automatic leveling control (ALC) circuit to ensure precise amplitude control over frequency and temperature.

The SC5502A tunes at 1 Hz steps over the entire frequency range with tuning speeds less than 1 ms for small frequency jumps. Typical amplitude range control is between -60 dBm and +10 dBm. Phase spurs are typically less than -70 dBc and other non-harmonic spurs are less than -70 dBc. This excellent spurious free dynamic range is achieved by well isolated internal circuitry. Isolation is achieved by robust mechanical design and close attention to circuit layout detail.

Frequency accuracy is provided by an onboard 10 MHz temperature compensated crystal oscillator (TCXO) which can be phase locked to an external reference source if required, and it is recommended to do so in applications that may require a more stable and accurate base reference.

The SC5502A can be used as a standalone CW signal source, or as a LO source for frequency conversion systems such as the SignalCore IQ modulators and demodulators. It is designed to meet the requirements of many modern applications such as wireless device testing, software-defined radio research, point-to-point radio, multichannel coherent systems, and other academic and military programs.

Product Features

- Low residual phase noise better than -121 dBc/Hz at 10 kHz offset, -150 dBc/Hz at 1 MHz offset, measured on 1 GHz carrier
- Tuning resolution 1 Hz (exact frequency)
- -60 dBm to +10 dBm output range
- Output spurious signals < -75 dBc typical
- 2nd order harmonics < -20 dBc



SC5502A SPECIFICATIONS

TECHNICAL SPECIFICATIONS (AT 25°C AMBIENT, SINE WAVEFORM)

SPECTRAL SPECIFICATIONS

| | |
|---|----------------------|
| RF output frequency range | 50 MHz to 10 GHz |
| Internal reference | |
| Stability ¹ | ±2.5 ppm |
| Aging | < 1 ppm after 1 year |
| Phase locking range | ±5 ppm |
| Tuning | |
| Resolution | 1 Hz |
| Speed (settled to .1 ppm) ² | < 2 ms |
| Sideband phase noise ³ (typical, dBc/Hz) | |

| Offset | RF Frequency | | | |
|--------|--------------|-------|-------|-------|
| | 100 | 1 GHz | 5 GHz | 8 GHz |
| 100 Hz | -120 | -100 | -87 | -82 |
| 1 kHz | -132 | -112 | -99 | -95 |
| 10 kHz | -138 | -121 | -107 | -104 |
| 100 | -145 | -131 | -118 | -114 |
| 1 MHz | -153 | -150 | -142 | -140 |
| 10 MHz | -153 | -153 | -158 | -155 |

| | |
|--|-----------------|
| Sideband phase spurious signals ⁴ | |
| < 100 kHz | -70 dBc typical |
| > 100 kHz | -75 dBc typical |

AMPLITUDE SPECIFICATIONS

| | |
|--|---------------------|
| Output RF range ⁵ | - 60 dBm to +10 dBm |
| Max output | +17 dBm |
| Amplitude resolution | 0.5 dB |
| 2 nd order harmonics (0 dBm tone) | < -20 dBc |
| Sub-harmonics | < -70 dBc |
| Output level accuracy | |
| > -40 dBm to +13 dBm | < ±0.75 dB |
| < -40 dBm | < ±1.00 dB |
| Spurious signals | -75 dBc |

TERMINAL SPECIFICATIONS

| | |
|--------------------------------------|--|
| RF output terminal | |
| Impedance | 50 Ω |
| Connector type | SMA female |
| Coupling | AC |
| Reference input terminal | |
| Impedance (single ended) | 50 Ω |
| Connector type | SMA female |
| Coupling | AC |
| Frequency | 10 MHz |
| Amplitude range | -5 dBm to +10 dBm |
| Lock range | ±5 ppm |
| Reference output terminal | |
| Impedance (single ended) | 50 Ω |
| Connector type | SMA female |
| Coupling | AC |
| Frequency ⁶ | 10 / 100 MHz |
| Amplitude | +3 dBm |
| Communication interface | PXI Express |
| Power consumption | +12 V @ 2.8 A +3.3 V @ 0.2 A |
| Weight | 2.2 lbs (0.95 kg) |
| Dimensions (W x H x D, max envelope) | 1.6" x 5.2" x 8.4" |
| Warranty | 3 years parts and labor on defects in materials or workmanship |

ORDER INFORMATION

| | |
|------------|--|
| 7100026-01 | SC5502A, 50 MHz to 10 GHz Signal Source for PXI Express |
|------------|--|

Specifications are subject to change without notice. For the most recent product specifications, please visit www.signalcore.com.

(1) Stability of the internal 10 MHz reference source
 (2) Tuning step less than 50 MHz
 (3) Measured sideband noise include both AM and PM noise
 (4) These are phase modulated spurs measured out to 1 MHz offset from the carrier

(5) >9 GHz output power is +7dB
 (6) Reference clock frequency is user selectable between 10 MHz and 100 MHz