The SC5511A is a compact, high performance VCO based synthesized signal source with frequency ranging from 100 MHz to 20 GHz. Despite its small modular form factor that fits into the palm of the hand, it packs the instrument grade performance of large box instruments. Boasting low phase noise of -115 dBc/Hz @ 10kHz offset from a 10 GHz carrier, tuning the entire band at 1 Hz resolution, and having amplitude step resolution of 0.01 dB over the range of -25 dBm to +13 dBm sets the SC5511A apart from other small modular synthesizers. Furthermore, using a unique multiple phase-locked loop architecture the phase spurs are typically kept below -70 dBc across the tuning range, even at 1 Hz step resolution. Furthermore, using a high fundamental frequency VCO (20 GHz) and eliminating multipliers, sub-harmonics due to dividers are typically less than -70dBc and far out spurious signals are also kept below -70 dBc.

The SC5511A has an additional independent RF2 channel whose frequency range covers 100 MHz to 3 GHz with tuning resolution of 25 MHz. This makes the module ideal for both single-stage RF conversion systems, and dual-stage image suppression up/down converter systems. It makes a great general purpose laboratory signal source where demanding size, low phase noise, and signal purity are needed. It is also an ideal choice as an integrated clock source for fast DAC and ADC applications, especially those that require variable sampling rates.

**Product Features**

- Low residual phase noise typically -118 dBc/Hz at 10 kHz offset from 10 GHz carrier
- 100 MHz to 20 GHz output range
- 1 Hz tuning resolution (exact frequency)
- < -25 dBm to +13 dBm leveled output
- Spurious signals < -70 dBc typical
- Dual independent channels

**Simplified Functional Diagram**

**Applications**

- RF instrumentation
- Wireless communications
- Signal intelligence
- Data converters
**SC5511A Specifications**

**Technical Specifications** *(at 25°C ambient, sine waveform)*

**RF1 Spectral Specifications**
RF output frequency range ......... 100 MHz to 20 GHz
Internal reference
- Stability ........................................... ±200 ppb
- Aging ............................................. < 1 ppm after 1 year
Phase locking range ......................... ±5 ppm
Frequency step resolution ......... 25 MHz
Spurious Signals
- < 10 MHz offset
  - Typical ........................................ -65 dBc
  - max ............................................ -55 dBc
- > 10 MHz offset
  - typical .................................... -75 dBc
  - max ....................................... -70 dBc

**RF1 Amplitude Specifications**
Output range ............................... -25 dBm to +13 dBm
Max output .................................. >+15 dBm typical
Amplitude resolution .................... 0.01 dB
2nd order harmonics (0 dBm) ........... < -20 dBc
Sub-harmonics ............................. <70 dBc typical
Output level accuracy ................. < ±1.0 dB typical

**RF2 Specifications**
RF range ..................................... 100 MHz to 3 GHz
Frequency step resolution .......... 25 MHz
Power output ............................... 5 dBm typical
2nd order harmonics (0 dBm) ........... < -15 dBc
Phase Noise @ 1 GHz
- 1 kHz ................................ -110 dBc/Hz
- 10 kHz ................................ -118 dBc/Hz
- 100 kHz ................................ -118 dBc/Hz
- 1 MHz ................................ -142 dBc/Hz
- 10 MHz ................................ -160 dBc/Hz

**Terminal Specifications**
RF output terminals
- Impedance ........................................ 50 Ω
- Connector type ............................... SMA female
- Coupling ........................................ AC
Reference input terminal
- Impedance ........................................ 50 Ω
- Connector type ............................... SMA female
- Coupling ........................................ AC
Frequency ....................................... 10 MHz
Amplitude range ......................... 0 dBm to +13 dBm
Lock range .................................... ±5 ppm
Reference output terminal
- Impedance ........................................ 50 Ω
- Connector type ............................... SMA female
- Coupling ........................................ AC
Frequency ....................................... 10/100 MHz
Amplitude .................................... +3 dBm typ

**Environmental**
Operating temperature ............... -10 °C to +55 °C
Operating relative humidity .......... 10% to 90%, non-condensing
Operating shock ......................... 30g, half-sine pulse, 11 ms duration
Operating vibration ...................... 5 Hz to 500 Hz, 0.31 gms
Altitude ........................................ 2000 m max (maintaining 25 °C ambient temperature)

**General Specifications**
Power consumption ....................... +12 V @ 1.6 A
Weight .......................................... 1 lb
Dimensions (W x H x D, max envelope) .... 0.75” x 3.75” x 5.75”
Warranty ........................................ 2 years parts and labor on defects in materials or workmanship

**Order Information**
7100045-01 SC5511A, 20 GHz Signal Source USB and SPI Interfaces
7100045-02 SC5511A, 20 GHz Signal Source USB and RS-232 Interfaces

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

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1. Internal reference is a TCXO. For better accuracies and stability, SignalCore recommends phase-locking to a precision external source.
2. For step change of less than 100 MHz and only when automatic level adjustment is turned off.
3. Specified for channel RF1 at power levels of greater than 0 dBm.
4. Output leveled range is typically 30 dBm to +13 dBm for frequencies less than 18 GHz. The leveled range is typically 30 dBm to +10 dBm for 18 GHz. ALC closed.
5. Output levels < -25 dBm may degrade to ±3.0 dB typical at some frequencies and not guaranteed.
6. User must provide cooling to maintain internal device temperatures of 0°C to 75°C.