SC5506A

6 GHz Dual Channel Signal Source Core Module

The SC5506A is a compact 6 GHz dual channel CW signal source. The two channels provide independent frequency generation from 25 MHz to 6 GHz in frequency steps of 1 Hz. Both channels have a common internal 10 MHz TCXO reference, which can be phase locked to an external source for frequency synchronization.

The SC5506A has very low phase noise of better than -115 dBc/Hz at 10 kHz offset from a 1 GHz carrier. Using a unique multiple phase-locked loop architecture, the phase spurs are kept below -70 dBc across the tuning range, even at 1 Hz step resolution. Harmonics are typically less than 30 dBc, and spurious signals are kept below -70 dBc. Channel-to-channel isolation is better than 70 dB.

The SC5506A is designed with the intent of being paired with SignalCore IQ modulators and demodulators such as the SC5413A and SC5313A respectively, to form RF transceivers. It also serves well as LO sources for multiple single stage downconverters or a dual stage downconverter. Due to its low spurious content and low phase noise, it is an ideal choice as a clock source for fast DAC and ADC applications, especially those that require variable sampling rates. Its compact size and instrument grade performance make the SC5506A an ideal RF source for many modern applications including wireless test, radar, digital clocking, instrumentation, academic research, and defense.

Product Features

- Low residual phase noise better than -115 dBc/Hz at 10 kHz offset, -140 dBc/Hz at 1 MHz offset, measured on 1 GHz carrier
- Low phase spurious content < -70 dBc
- 25 MHz to 6 GHz output range
- 1 Hz tuning resolution (exact frequency)
- < -50 dBm to +10 dBm leveled output
- Spurious signals < -70 dBc typical
- Channel isolation > 70 dB
- Automatic level control

SignalCore™
PRESERVING SIGNAL INTEGRITY

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

SPECTRAL SPECIFICATIONS

RF output frequency range [1] ..... 25 MHz to 6 GHz
Internal reference
- Stability [2] ..... ±2.5 ppm
- Aging ..... < 1 ppm after 1 year
- Phase locking range ..... ±5 ppm

Tuning
- Resolution ..... 1 Hz
- Speed (settled to .1 ppm) [3] ..... < 500 us

Sideband phase noise (dBc/Hz)

	RF Frequency			
Offset	100	1 GHz	3 GHz	6 GHz
100 Hz	-107	-87	-85	-83
1 kHz	-119	-99	-98	-97
10 kHz	-135	-115	-110	-105
100	-136	-116	-111	-106
1 MHz	-150	-140	-130	-124
10 MHz	-150	-150	-149	-147

Sideband phase spurious signals
- < 100 kHz ..... -65 dBc typical
- > 100 kHz ..... -70 dBc typical

AMPLITUDE SPECIFICATIONS

Output RF range ..... -50 dBm to +10 dBm
Max output ..... +16 dBm typical
Amplitude resolution ..... 0.1 dB
2nd order harmonics (0 dBm) [4] ..... < -30 dBc
Output level accuracy
- > -30 dBm to +10 dBm ..... < ±0.5 dB
- < -30 dBm ..... < ±0.75 dB

TERMINAL SPECIFICATIONS

LO output terminals
- 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 ..... 10 MHz
- Amplitude ..... +3 dBm

Communication Interface ..... USB / RS-232 / SPI
Digital interface ..... HDMI type
- Logic type ..... 3.3V HCT (5V tolerant inputs)

Power consumption ..... 18 W typical
Weight ..... 0.9 lbs
Dimensions (WxHxD, max envelope) .. 0.75”x3.75”x5.75”
Warranty ..... 3 years parts and labor on defects in materials or workmanship

ENVIRONMENTAL

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

ORDER INFORMATION

7100036-01 ..... SC5506A, 6 GHz Dual Channel Signal Source Core Module – USB and SPI Interfaces
7100036-02 ..... SC5506A, 6 GHz Dual Channel Signal Source Core Module – USB and RS-232 Interfaces

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

(1) Typically tunable from 23.5 MHz to 6150 MHz
(2) Internal reference is a TCXO. For better accuracies and stability SignalCore recommends phase-locking to a precision external source
(3) For step change of less than 100 MHz
(4) Harmonic levels are specified for frequencies greater than 350 MHz. At lower RF frequencies the harmonic levels could be as high as -12 dBc.

Rev 2.0

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