



Microwave Up/Down Converter with Signal Conditioning

SC2250 | Harmonic Measurement Unit

Summary

The SC2250 extends the useful range of traditional 6 GHz RF instruments for operation at microwave frequencies up to 18 GHz. It provides excellent integration capability with modular instruments such as National Instrument's Vector Signal Transceiver (VST). Selectable filtering is provided for signal conditioning applications requiring spurious and harmonic rejection.



SC2250 – Unparalleled Value in an 18 GHz Microwave Extension

Description

Both up and down-conversion functions are housed in a single-slot PXIe module. An independent local oscillator (LO) is available for each path. Optional LO input ports are provided to support measurements requiring extremely low phase noise performance.

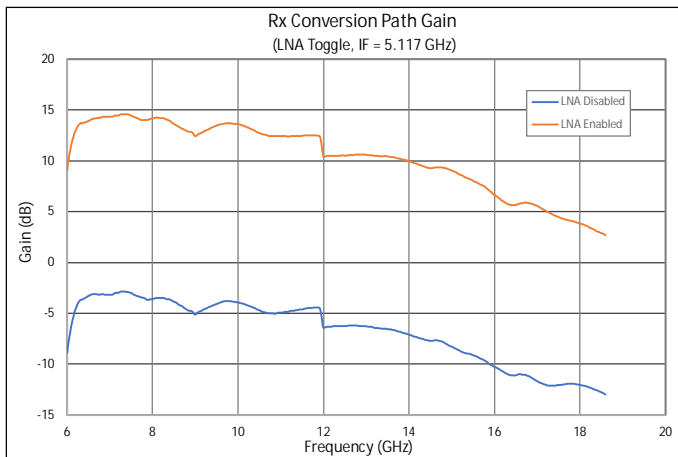
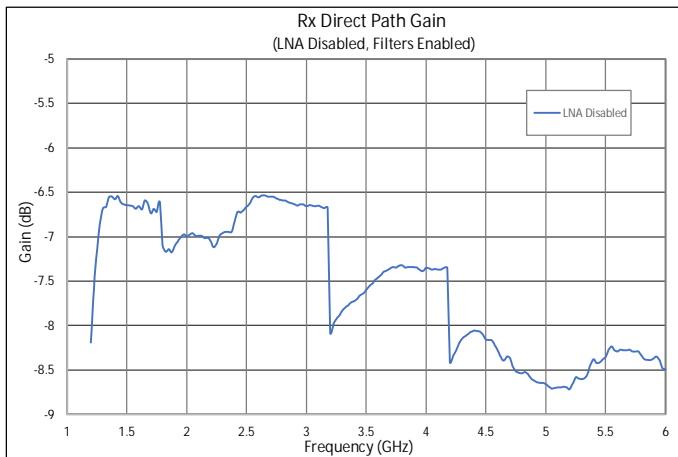
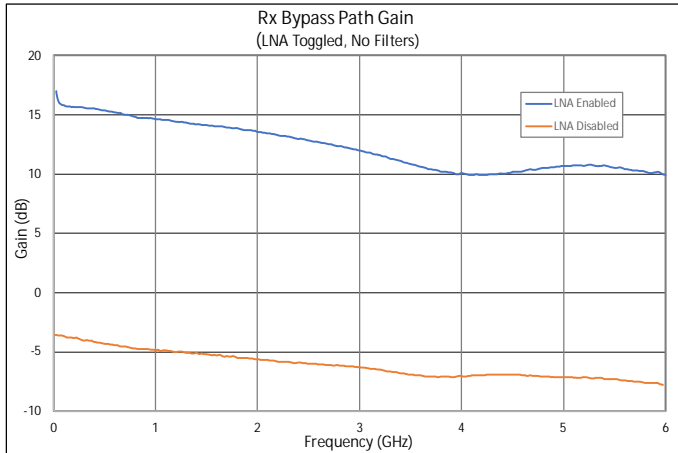
The receive down-converter includes a non-conversion (bypass) path to minimize setup complexity when the mixer is not required. The bypass path includes a filter bank and low noise amplifier for signal conditioning purposes. For harmonic measurement applications, high pass filters are enabled to reject the fundamental signal and provide better dynamic range. The down-converted signal can be passed through a 5GHz intermediate frequency (IF) filter for spurious rejection prior to output from the module.

Like its counterpart, the up-conversion path includes non-conversion and signal conditioning capabilities. User calibration of the instrument is possible using the internal loopback signal in the up-converter and the power detector.

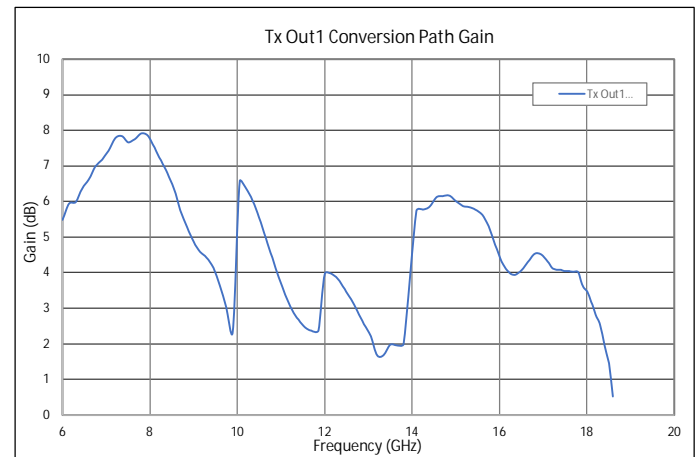
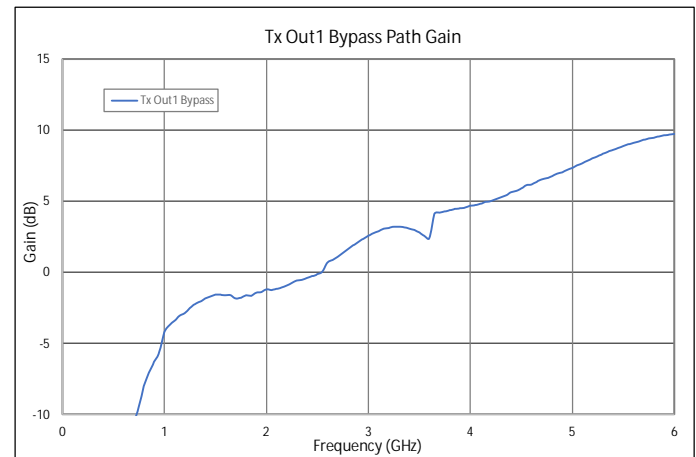
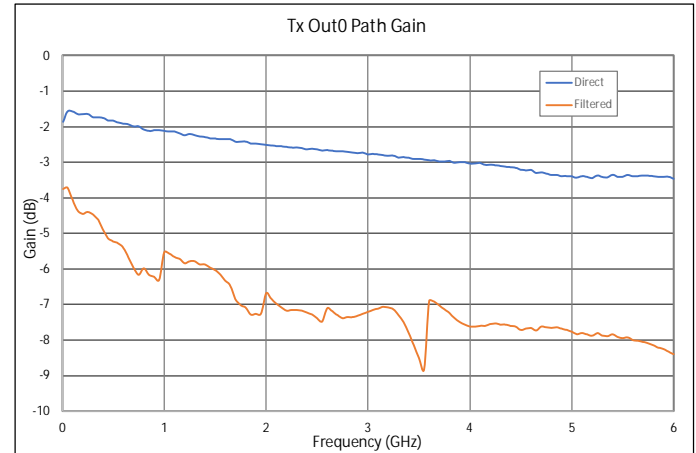
Common Applications

- Benchtop DVT (Designer Verification Testing)
- Harmonic Performance Testing in High Volume Production Test
- RF Design and Characterization
- 802.11ax (6425 to 7125 MHz) testing on legacy 6 GHz Instruments

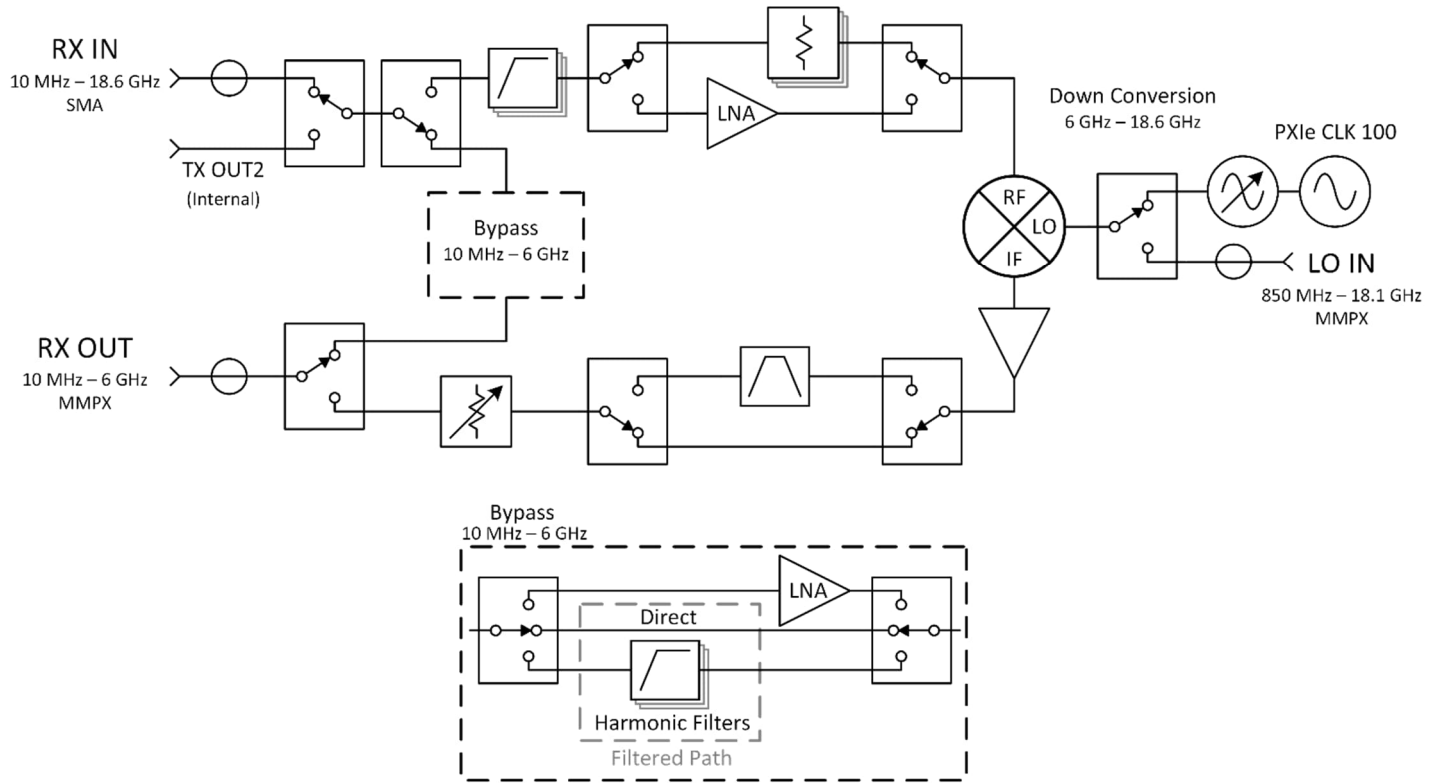
Typical Rx Path Performance



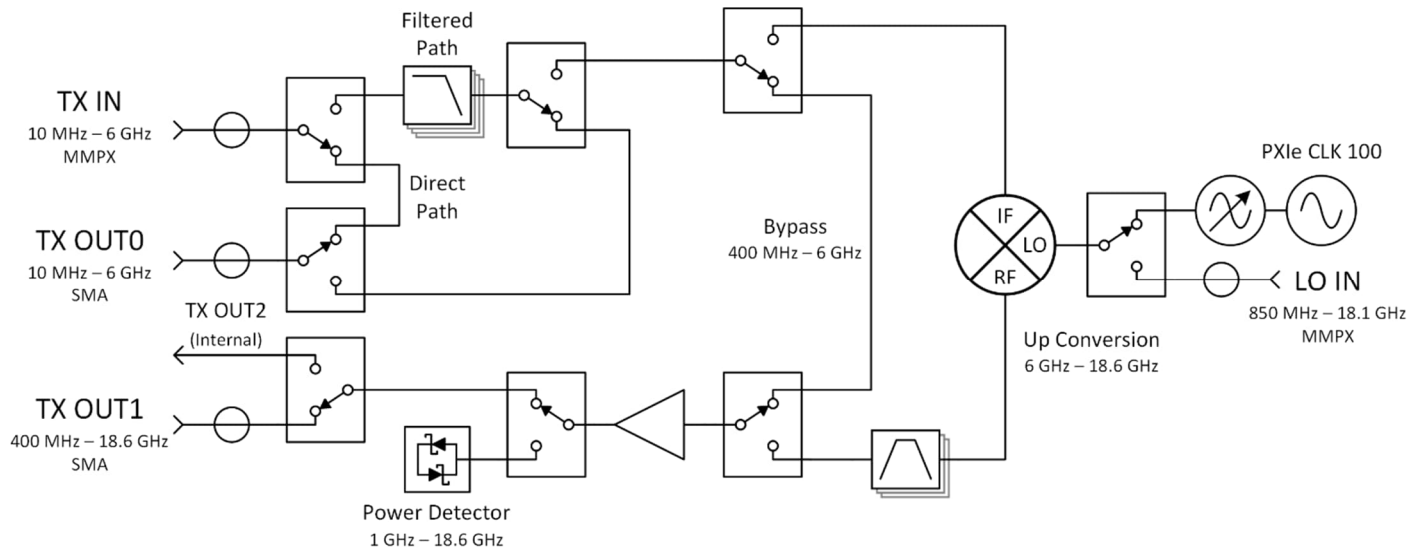
Typical Tx Path Performance



Rx (Down-Conversion Path) Block Diagram



Tx (Up-Conversion Path) Block Diagram



Specifications

Receive Down-Conversion Path

Allows higher frequency signals to be mixed down to a lower frequency that is compatible with many spectrum and signal analyzers.

- Input Frequency: 6.0 to 18.6 GHz
- Output center frequency: 0.5 to 6.0 GHz
- Maximum Input Power: +20 dBm
- Maximum Harmonic Input Power: -25 dBc
- Instrument Generated Harmonic Distortion (@20dBm):
 - 2nd: -80 dBc
 - 3rd: -75 dBc
- IF Filter Bandwidth: 200 MHz
- Calibrated Amplitude Accuracy: 0.5 dB
- Gain (@6 GHz):
 - 0 dB with Pre-Amplifier
 - -7 dB without Pre-Amplifier
- Gain (@18 GHz):
 - 0 dB with Pre-Amplifier
 - -13 dB without Pre-Amplifier

Receive Non-Conversion (Bypass) Path

Allows instrument to remain in the signal path and provides some optional signal conditioning for frequencies less than 6 GHz.

- Frequency range: 10 MHz to 6.0 GHz
- Insertion Loss: 9 dB max
- Rejection : > 50 dB
- LNA Path Gain : 10 dB

Transmit Up-Conversion Path

Allows signals to be conditioned and optionally mixed up to a higher frequency.

- Input Frequency range: 10 MHz to 6.0 GHz
- Output Frequency range: 6.0 to 18.6 GHz
- Maximum Output Power: 10 dBm max
- Fundamental Rejection: > 40 dB
- Calibrated Amplitude Accuracy: 0.5 dB
- Gain (@6 GHz): 4.5 dB
- Gain (@18 GHz): 0 dB

Transmit Non-Conversion (Bypass) Path

Conditions input signals by filtering out unwanted harmonic and spurious content.

- Frequency range: 10 MHz to 6.0 GHz
- Insertion Loss: 5 dB max
- Harmonic Rejection : > 40 dB

Environmental/Regulatory

- EN 61326-1:2013: Class A emissions; Basic Immunity
- AS/NZS CISPR 11: Group 1, Class A
- FCC Part 15/B: Class A emissions
- ICES-001: Group 1, Class A
- KN11: Group 1, Class A
- RoHS Compliant
- Operating temperature: 0 to 50°C
- Storage temperature: -40 to 70°C

Optional Features

Option 21 – Extended warranty

Extends the standard software maintenance and warranty from 12 to 24 months.



Support

Technical support is available through our website, www.signalcraft.com/support, or by contacting us at support@signalcraft.com.

Warranty

Full one-year parts and labor when used under normal installation and operation conditions. Repair services are available for products no longer covered under warranty.

Ordering Information

Send inquiries to info@signalcraft.com.