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PXI Modules

3010/3011 PXI RF Synthesized Signal Generator



Low noise RF signal synthesis with 1 Hz resolution

- Frequency range 1.5 GHz to 3.0 GHz
- Resolution 1 Hz
- Phase noise typically -116 dBc/Hz at 20 kHz Offset
- Frequency agile, typically 250 µs settling time with Option 01 fitted
- Internal or external reference frequency
- High stability variant with OCXO reference

Introduction

The 3010/3011 RF synthesized signal generator PXI modular instruments are high performance fixed output level frequency synthesizer instruments covering the range 1.5 GHz to 3.0 GHz. Using Aeroflex patented technology, these instruments provide 1 Hz frequency resolution combined with excellent phase noise performance and frequency agility all in a single width 3U PXI form factor.

Applications

The 3010 and 3011 can be used as a stand alone CW signal generator, or as the LO input to the 3020 series digital RF signal generator or 3030 Series RF digitizer.

Used with the 3020 series, the 3010 completes an IQ modulated signal source with a frequency range up to 6 GHz.

Used with the 3030 Series, the 3010 completes an RF digitizer for analysis of signals up to 6 GHz.

Performance Highlights

Low Phase Noise: The 3010's phase noise of typically –116 dBc/Hz at 20 kHz offset makes it ideal for use in radio communications test applications. Phase noise can be optimized for close to carrier performance or for performance in the offset region 5 kHz to 100 kHz.

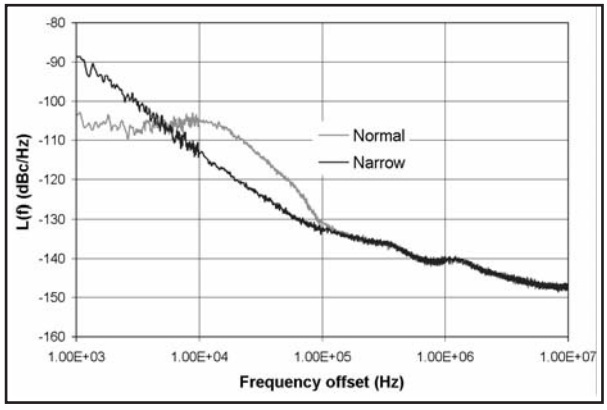


Figure 1. Typical Phase Noise profile at 2 GHz

Frequency Agility: Frequency settling times of typically 250 µs can be achieved with option 01 making the 3010 suitable for use in high volume RF component test systems or in testing of frequency hopping radios. As standard, 3010 provides frequency switching times of typically 1.1 ms (loop bandwidth set to normal).

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High Stability Frequency Reference Variant: The 3010 RF synthesizer is supplied for use with either an internal VCXO frequency standard or an external 10 MHz frequency reference. The high stability variant, 3011 is fitted with an OCXO 10 MHz frequency reference. In this case it is also available as an output for connection to other PXI modular instruments such as 3020 and 3030.

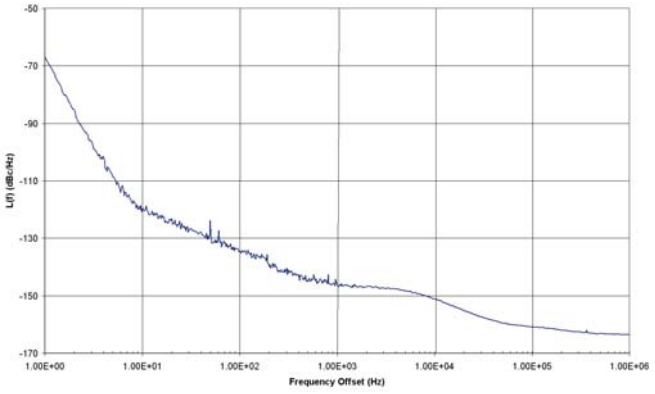
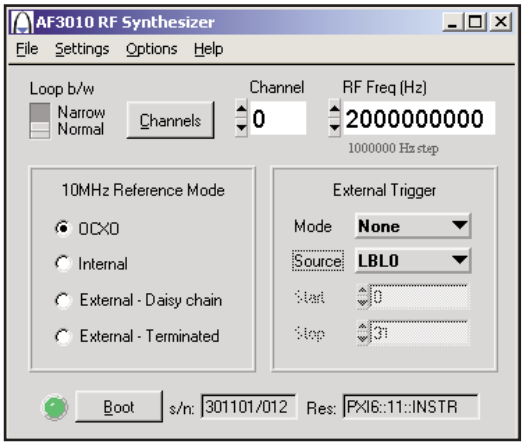


Figure 2. Typical 10 MHz reference phase noise profile

Software

The 3010 and 3011 are supplied with a VXI PNP Driver and soft front panel.



Customer Support.

Users can elect to purchase PXI modular instrument with optional warranty extensions.

Standard Extended Warranty provides either 36 months or 60 months warranty period plus the benefits of guaranteed product repair times in the event of failure.

Standard Extended Warranty can also be provided inclusive of scheduled calibration.

On request Aeroflex can provide customized Premium Warranty support designed around your specific needs.

SPECIFICATION

All specifications are common to 3010 and 3011 unless otherwise stated

RF OUTPUT

Frequency Range

1.5 GHz to 3.0 GHz

Resolution

1 Hz

Accuracy

As frequency standard

Output Power

Fixed level in the range -4 dBm to +3 dBm

Output Impedance

50 Ω Nominal

VSWR

<2:1

SPECTRAL PURITY

Phase Noise

(typical at 2 GHz and at ambient room temperature)

Loop Bandwidth	***Narrow***	***Wide (normal)***
Offset	dBc/Hz	dBc/Hz
100 Hz	-55	-85
1 kHz	-85	-103
10 kHz	-114	-103
20 kHz	-116	-110
100 kHz	-133	-130
1 MHz	-140	-140
10 MHz	-146	-146

Phase noise below 100 Hz is dependent upon reference phase noise.

FREQUENCY SETTLING TIME

Time taken to be within 1 kHz of final demanded frequency

Normal Loop Bandwidth

As standard: Typically 1.1 ms

With option 01 fitted: Typically 250 µs

Narrow Loop Bandwidth

Typically <10 ms

RF LEAKAGE

<5 µV PD at the carrier frequency into a single turn 25 mm loop, 25 mm or more from the front panel

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GENERAL

Standard Warranty

24 months

Calibration Interval

Recommended 24 months

Power Consumption (typical)

+3.3 V	*50 mA (250 mA transiently during power up)*
+5 V	*650 mA*
+12 V	*50 mA**
-12 V	*30 mA*

** 3011 OCXO requires 300 mA startup reducing to 150 mA after 5 minutes*

Electromagnetic Compatibility

EN 61326-1:1997, Emissions Class A, Immunity Table 1 – Performance Criteria B

Safety

EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control and laboratory use-Part 1, General requirements

Driver Software

VXIpnp compliant software driver

System Requirements

The recommended minimum system requirements are:

Intel Pentium IV – 1.3 GHz or better

512 MB RAM (for 8-slot chassis - larger PXI chassis may require more memory to be fitted)

200 MB free disk space

1024 x 768 display resolution

CD-ROM drive, network access, or USB memory stick for software installation

Microsoft Windows XP Professional with Service Pack 2

Microsoft Windows 7

NI-VISA - 3.1.0 or later

INTERNAL FREQUENCY REFERENCE

Output (3011 only)

2 V pk-pk norminal square wave into 50 ohms

Frequency

10 MHz

Aging Rate

3010: Unspecified
3011: 1 in 10^9 per day 1 in 10^7 per year

Temperature Stability (0 to 50°C)

3011: Typically better than $\pm 1 \times 10^{-8}$

Warm-Up Time

3010, N/A
3011, <5 Minutes

EXTERNAL FREQUENCY REFERENCE

Input

0.4 V to 4 V pk-pk into 50 ohms or looped through

Frequency

10 MHz ± 100 Hz

Phase Noise Minimum Requirements*

Nominal phase noise requirements to meet typical LO out phase noise specification

	Narrow mode	Wide mode
100 Hz	*-103*	*-133*
1 kHz	*-124*	*-138*
10 kHz	*-128*	*-123*

** The synthesiser will still function if these values are exceeded but the output phase noise could be degraded*

INTERFACES

RF output (SMA), 10 MHz reference I/O (SMA x 2), PCI bus interface including PXI triggering functions

DIMENSIONS AND WEIGHT

Dimensions

Single width 3U PXI modular instrument

Weight

3010, 375 g
3011, 390 g

RATED RANGE OF USE

Operating Temperature

0 to 50°C. Meets IEC-60068-2-1 and 60068-2-2

Operating Humidity

10 to 90% non-condensing. Meets IEC-60068-2-56

CONDITIONS OF STORAGE AND TRANSPORT

Storage Temperature

-20 to +70°C. Meets IEC-60068-2-1 and 60068-2-2

Storage Humidity

5 to 93% non-condensing. Meets IEC-60068-2-56

Shock

30 g peak, half sine, 9 ms pulse. Tested in accordance with IEC-60068-2-27

Random vibration 5 Hz to 500 Hz, 2.46 g rms non-operating. Tested in accordance with IEC-60068-2-64

COMPLIANCE

PXI Specification, Revision 2.2

VXIplug&play Specifications (VPP-2, VPP-3.x, VPP-4.x and VPP-7)

For the very latest specifications visit www.aeroflex.com

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VERSIONS, OPTIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering Numbers	Versions
3010	PXI RF Synthesized Signal Generator
3011	PXI RF Synthesized Signal Generator (including OCXO high stability 10 MHz reference)
	Supplied with
	CDROM containing VXI PNP driver, soft front panel and user documentation (46886/028)
	2 x SMA link cable (43139/738)
	Options
3010 Opt 01	High speed frequency switching
	Service Options
	Service options are common to 3010 and 3011
W3010/103	Standard Extended Warranty 36 months
W3010/103C	Standard Extended Warranty 36 months with scheduled calibration
W3010/105	Standard Extended Warranty 60 months
W3010/105C	Standard Extended Warranty 60 months with scheduled calibration
	Accessories
43139/738	SMA link cable (130 mm)
46885/224	SMA connector saver

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.

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