

PXI Modules

3010/3011 PXI RF Synthesized Signal Generator

AEROFLEX
A passion for performance.



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 μ s 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.

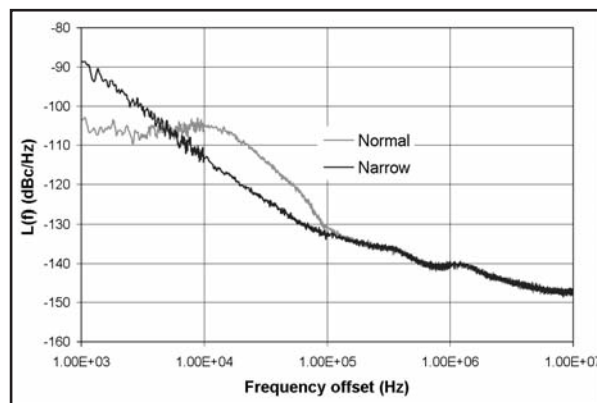


Figure 1. Typical Phase Noise profile at 2 GHz

Frequency Agility: Frequency settling times of typically 250 μ s 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).

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.

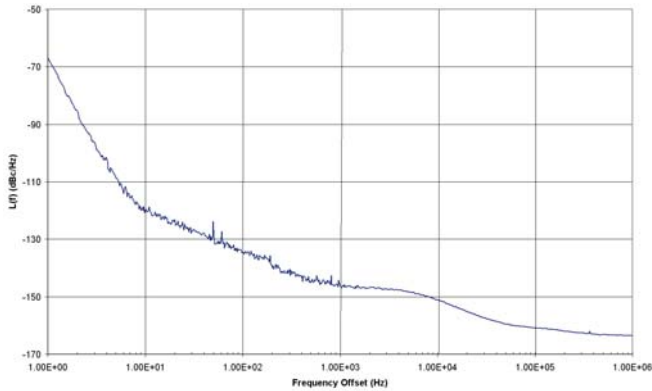
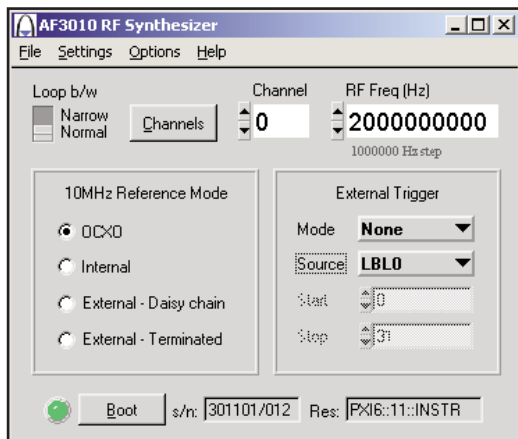


Figure 2. Typical 10 MHz reference phase noise profile

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

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

VXIplug compliant software driver

INTERNAL FREQUENCY REFERENCE

Output (3011 only)

2 V pk-pk nominal square wave into 50 ohms

Frequency

10 MHz

Aging Rate

3010: Unspecified

3011: 1 in 10⁹ per day 1 in 10⁷ 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 \pm 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)

VERSIONS, OPTIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering Numbers

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
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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

CHINA Beijing

Tel: [+86] (10) 6539 1166
Fax: [+86] (10) 6539 1778

CHINA Shanghai

Tel: [+86] (21) 5109 5128
Fax: [+86] (21) 6457 7668

FINLAND

Tel: [+358] (9) 2709 5541
Fax: [+358] (9) 804 2441

FRANCE

Tel: [+33] 1 60 79 96 00
Fax: [+33] 1 60 77 69 22

GERMANY

Tel: [+49] 8131 2926-0
Fax: [+49] 8131 2926-130

HONG KONG

Tel: [+852] 2832 7988
Fax: [+852] 2834 5364

INDIA

Tel: [+91] (0) 80 4115 4501
Fax: [+91] (0) 80 4115 4502

JAPAN

Tel: [+81] 3 3500 5591
Fax: [+81] 3 3500 5592

KOREA

Tel: [+82] (2) 3424 2719
Fax: [+82] (2) 3424 8620

SCANDINAVIA

Tel: [+45] 9614 0045
Fax: [+45] 9614 0047

SPAIN

Tel: [+34] (91) 640 11 34
Fax: [+34] (91) 640 06 40

UK Cambridge

Tel: [+44] (0) 1763 262277
Fax: [+44] (0) 1763 285353

UK Stevenage

Tel: [+44] (0) 1438 742200
Fax: [+44] (0) 1438 727601
Freephone: 0800 282388

USA

Tel: [+1] (316) 522 4981
Fax: [+1] (316) 522 1360
Toll Free: 800 835 2352

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www.aeroflex.com
info-test@eroflex.com



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