

# PXI Modules

## 3010/3011 PXI RF Synthesizer

**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  $\mu$ s settling time with Option 01 fitted
- Internal or external reference frequency
- High stability variant with OCXO reference

### Introduction

The 3010/3011 RF synthesizer modules are high performance fixed output level frequency synthesizers covering the range 1.5 GHz to 3.0 GHz. Using Aeroflex patented technology, the modules provide 1 Hz frequency resolution combined with excellent phase noise performance and frequency agility all in a single width 3U module.

### Applications

The 3010 and 3011 can be used as a stand alone frequency synthesizer, or as the core synthesizer with the 3020 series digital RF signal generator or 3030 series RF digitizer.

Used with the 3020A, the 3010 completes an IQ modulated signal source with a frequency range of 250 MHz to 2.7 GHz and an output level range of +5 dBm to -120 dBm.

Used with the 3030A, the 3010 completes an RF digitizer for input signals in the frequency range of 330 MHz to 3 GHz and up to 33 MHz in bandwidth.

### 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.

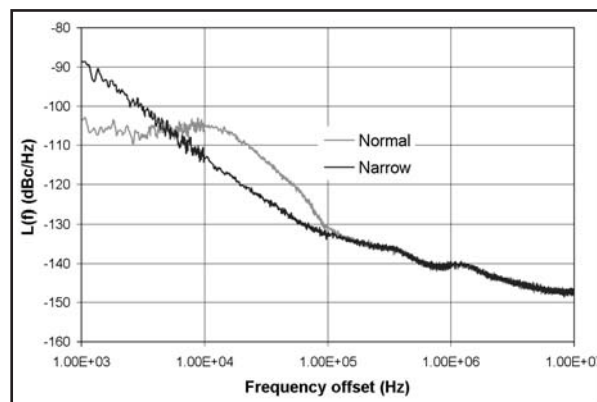


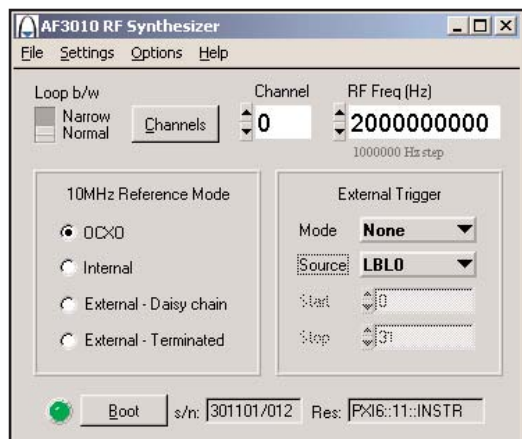
Figure 1. Typical Phase Noise profile at 2 GHz

**Frequency Agility:** Frequency settling times of typically 250  $\mu$ 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 equipment.

## Software

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



## Customer Support.

Users can elect to purchase PXI modules 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  $\Omega$  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  $\mu$ s

### Narrow Loop Bandwidth

Typically <10 ms

## RF LEAKAGE

<5  $\mu$ V 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

VXI|pnp 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 10<sup>9</sup> per day 1 in 10<sup>7</sup> 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

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### Input

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

### Frequency

10 MHz  $\pm$  100 Hz

## INTERFACES

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

## DIMENSIONS AND WEIGHT

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### Dimensions

Single width 3U PXI module

### Weight

3010, 375 g

3011, 390 g

## RATED RANGE OF USE

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### 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

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### 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

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PXI Specification, Revision 2.1

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

## VERSIONS, OPTIONS AND ACCESSORIES

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When ordering please quote the full ordering number information.

### Ordering Numbers

3010

3011

### Versions

PXI RF Synthesizer

PXI RF Synthesizer (including OCXO high stability 10 MHz reference)

### Supplied with

CDROM containing VXI PNP driver, soft front panel and user documentation (46886/028)

SMA link cable (43138/421)

SMA connector saver (46885/224)

### Options

3010/11 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

43138/421 SMA link cable

46885/224 SMA connector saver

46662/767 PXI hard carry case (for use with 82563, 82544)

82536 PXI assy, 8 slot chassis with 2.2 GHz P4 embedded controller (Windows XP)

82544 PXI assy, 8 slot chassis with MXI-4 PCI-PXI interface

82538 PXI assy, 18 slot chassis with 2.2 GHz P4 embedded controller (Windows XP)

82545 PXI assy, 18 slot chassis with MXI-4 PCI-PXI interface

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