

# PXI Modules

## 3030 Series RF Digitizers



Fully featured wideband PXI RF digitizer modules for complex signal analysis applications in communications system test

- RF down converter with frequency breaks at 3 GHz, 6 GHz and 13 GHz
- Input level control up to +30 dBm with up to 31 dB of RF input level control
- Maximum sensitivity to typ -150 dBm/Hz
- Instantaneous (-1 dB) IF bandwidths of up to 36 MHz or 90 MHz
- Digitizer ADC resolution of 13 bits or 14 bits sampled at up to 250 MHz
- Digital down converter variable sample rates up to 250 MSa/s
- 75 dB spurious free dynamic range
- 75 dB intermodulation free dynamic range
- Excellent level accuracy of typically 0.3 dB
- List mode for fast frequency and reference level settling
- Up to 512 MByte sample memory
- Real time streaming output of sample data
- 'PXI Studio' VSA/VSG application software

### Analyzing RF communications signals has never been more flexible

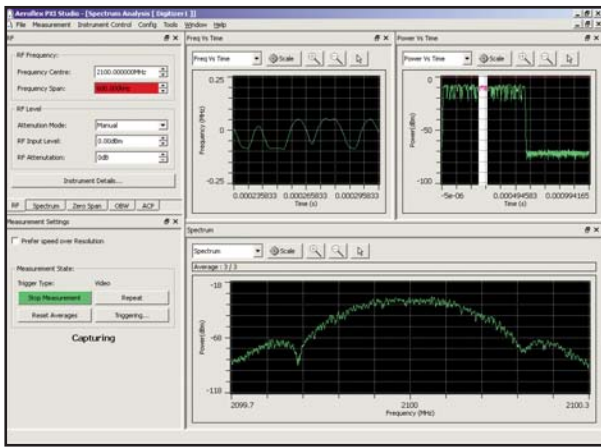
The 3030 Series range of RF Digitizers used with a 3010 Series synthesizer module provide precision conversion of RF signals into digital IF or I and Q data. Used with PXI Studio application software, the 3030 Series RF Digitizer family provides class leading vector signal analysis of RF signals with functionality and performance ideally matched to the needs of RF test systems for manufacturing and design verification.

There are 5 different RF Digitizers to choose from. Each model provides a different combination of RF frequency range and measurement bandwidth.

All 3030 Series RF Digitizer modules offer high linearity, low noise, excellent level accuracy and superior IF bandwidth flatness, making them especially suited for the analysis of WLAN, WMAN and 2G, 3G and 4G cellular radio signals as well as general purpose analog and complex modulation signals used in modern communication systems.

### PXI Studio Application Software

PXI Studio is a software application for use with all Aeroflex 3000 Series PXI modules. This highly flexible application can provide vector signal generation and vector signal analysis of complex modulated signals. As standard PXI Studio provides a single integrated user interface to all Aeroflex PXI modules and performs spectrum and time domain analysis of sample data for general purpose RF component testing and alignment of radio communications transceivers. Optional measurement suites can be added easily as plug-ins. Each provides an intuitive and highly flexible graphical user interface. A full description and specification for each measurement plug-in is provided in separate data sheets for 3030 Series RF Digitizer measurement suite options.



PXI Studio Spectrum Analyzer Screen Shot

### Advantages of PXI

The 3030 Series RF digitizers offer significant economies compared to general purpose rack and stack instruments without compromising performance. In part this is achieved by exploiting the benefits of the PXI specification, an industry standard open architecture for modular instrumentation. Using PXI enables faster measurement speed, smaller size and greater flexibility for easier system integration and future system evolution.

### Applications

The 3030 Series RF digitizer is an essential component within any development or manufacturing RF test system designed around the needs of advanced digital communications standards for wireless data. Whether the application is for test, measurement or system emulation, the 3030 Series delivers the functionality and performance required. When used in conjunction with other Aeroflex PXI RF modules, chassis and system controllers complete RF test systems can be configured. 3036 adds extended frequency range to enable harmonic measurement of fundamental signals below 6.5 GHz.

For each Digitizer variant there is a complementary\* 3020 Series digital RF signal generator module able to produce wideband linear complex modulated RF signals up to 6 GHz. Aeroflex PXI modular instruments are supplied as individual single modules for use within any compliant cPCI or PXI chassis supporting 3U high modules and a slot 1 PXI system controller supporting Microsoft Windows operating systems and NI VISA. Alternatively Aeroflex can supply PXI modules pre-configured within a PXI chassis with a slot 1 PXI system controller, (see order information for further details).

\*excluding 3036

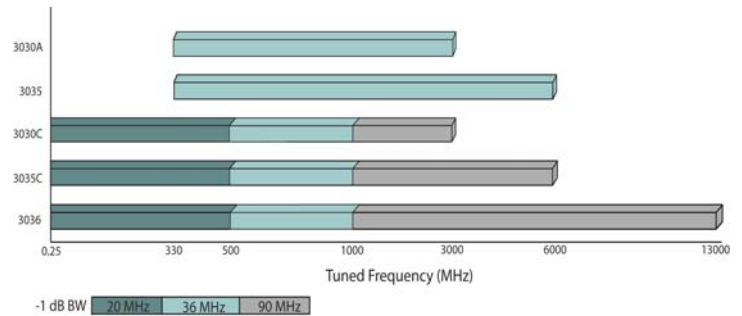


3000/3000B Chassis

### Performance Highlights:

#### Wide Frequency Range:

- There is a wide range of frequencies to choose from:
- 250 kHz or 330 MHz to 3 GHz
- 250 kHz or 330 MHz to 6 GHz
- 250 kHz to 13 GHz



**Level Range:** Peak signal powers up +30 dBm can be input directly and with a maximum sensitivity down to typically -147 dBm/Hz very low level signals are easily discernible from noise, especially useful when measuring transmitter spurious outputs.

Control of RF input level is provided using reliable, high speed electronic switched attenuation. To optimize down converter operating conditions, RF attenuation is selectable in 1 dB steps to a maximum of 31 dB (4 dB steps to 28 dB in 3030A). IF attenuation\* is selectable in 1 dB step to 35 dB to optimize ADC operating point. Together they allow optimization of dynamic range for a wide range of input signal powers and signal characteristics.

\*set automatically within PXI Studio application software

**Level Accuracy:** With a total measurement uncertainty of typically  $\pm 0.3$  dB, accurate RF power measurements in high volume manufacturing are made possible. Together with  $\leq \pm 0.05$  dB repeatability error ensures that high yields can be maintained.

**High Dynamic Range:** The 3030 Series is designed for difficult transmitter measurements such as burst power in TDD and TDMA systems and spectral emissions on WLAN/WMAN, 2G, 3G and 4G cellular terminals. Measurement of GSM burst power ramps with over 80 dB dynamic range is possible in a single step. ACLR and spectral mask measurements on WCDMA signals can also be made in a single step with a measurement range of typically 68 dB for ACLR.

**Wide Bandwidth:** -1 dB bandwidth of up to 90 MHz is achieved. Amplitude flatness of  $\pm 0.1$  dB is maintained over a 5 MHz bandwidth and  $\pm 0.25$  dB flatness is maintained for bandwidths up to 67 MHz. Phase flatness of  $< \pm 0.03$  radians is maintained over 67 MHz bandwidth.

**Low Phase Noise:** The 3030 Series modules are all designed to be used with either a PXI 3010 or 3011 RF synthesizer module. This provides a low noise agile local oscillator signal from which the 3030 Series phase noise is defined.

RF Frequency	Typical phase noise at 20 kHz offset (dBc/Hz)
50 MHz	-112
500 MHz	-118 (3030A/3035) -112 (3030C/3035C/3036 only)
2 GHz	-116
5 GHz	-108

Noise floor at 2 GHz is typically -138 dBc/Hz from 10 MHz offset.

### Fast Switching

Frequency settling can be achieved in typically 250  $\mu$ s, (3010 opt 01 fitted). This makes the 3035 ideal for high productivity RFIC testing.

### Flexible ADC

Sample data is available as digital IF samples at the full ADC sample rate or as digitally down converted, decimated and re-sampled I & Q data samples at a user defined rate. Sample data can be both block transferred across the PCI interface and streamed out of the front panel data interface. Samples rates of up to 90 MSa/s can be supported for streaming applications e.g. in radio system emulation type applications or for producing uninterrupted time records for RF events. Captured I&Q sampled at up to 250 MSa/s can be block transferred from on board memory over the PCI bus. On board sample memory supports acquisition of up to 256 M x 16 bit samples. Data transfer to the PCI backplanes can be pipelined (overlapped) with data acquisition to accelerate test speed. Furthermore the driver software provides the ability to commence processing of captured IQ whilst acquisition is still in progress for near real time measurement speed.

Data reduction is supported whereby the user can select a subset of acquired data to be passed for processing. This reduces unnecessary data transmission and can help improve measurement speed. This can be especially useful for TDMA type systems such as GSM. It makes it possible to only transfer active burst data for analysis reducing the number of samples to transfer by approximately 80%. Data acquisition can be edge triggered and the sample length defined by the user or it may be gated in which case the acquisition period is defined by the gate width.

### Small Size

The 3030 Series modules are unparalleled in terms of size. Test systems can be assembled occupying a fraction of the space required for conventional instrumentation. Each module occupies just 2 or 3 slots in a 3U PXI rack. With a single additional slot to accommodate the 3010 RF synthesizer the complete Wideband Digitizer occupies either 3 or 4 slots

### Triggering and Synchronization

The 3030 Series highly versatile acquisition trigger modes maximize flexibility in synchronized measurement applications. Acquisition can be triggered by software or hardware triggers including the PXI trigger bus, local bus, star trigger as well as via front panel TTL and LVDS inputs. Internal IF video and frequency selective IQ level triggering can be derived from the received signal with facilities to prevent false triggering from noisy signals. All trigger modes are supported by a user definable +ve and -ve trigger delay.

A trigger hold off mode is provided to allow control of trigger re-arming. This can be especially useful when acquiring TDD type signals as used in WLAN and WIMAX.

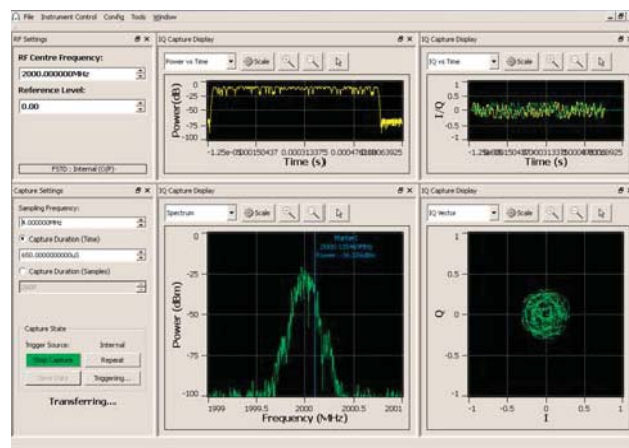
### List Mode

This feature enables the digitizer to be pre-loaded with up to 128 combinations of different frequency and level settings. All digitizer internal hardware settings are pre-calculated making re-selection of a new frequency possible in typically 250  $\mu$ s, (3010 opt 01 fitted) while still maintaining level accuracy. This feature is ideally suited for fast mobile phone transmitter alignment applications and is complemented by similar features in the 3020 Series RF signal generator in support of the corresponding fast mobile phone receiver alignment. Channelized timer mode allows setting of variable list dwell period (in output samples).

### Software

Each RF digitizer is supplied with a variety of software including; Aeroflex PXI Studio application software with standard and optional plug-ins to measurement libraries. Each digitizer is also supplied with various driver software and soft front panels.

**Driver Software:** All 3030 Series modules are supplied with multi layered software APIs and GUIs starting with a common low level VXIbnp compatible 'module' driver and a single high level 'RF Digitizer' driver for the combination of a 3030 Series and a 3010 Series module. Each driver is supplied as a .dll interface. Additional .net and COM interfaces are provided for the RF Digitizer level driver. Both the module and RF Digitizer drivers are supported with associated soft front panel graphical user interfaces to aid manual operation and debugging during application development.



3030 Series Module Soft Front Panel

### PXI Studio Spectrum Measurement Suite Highlights

As standard the 3030 Series modules are supplied with a spectrum analyzer plug-in for use in PXI Studio and a spectrum measurement .dll interface for application developers providing frequency and time domain analysis of 3030 Series digitized I & Q data.

The spectrum analyzer plug-in provides a graphical user interface for manual operation in bench top applications. Using the spectrum analyzer plug-in analysis can be performed for frequency spans up to 200 MHz. The resolution bandwidth is continuously variable from 1 Hz to 10 MHz using 3 dB or noise equivalent bandwidth windows. A range of spectrum measurement functions are also provided including:

**Channel Power and Adjacent Channel Power Measurement:** The user defines the channel configuration to be measured (i.e. channel width, channel spacing, center frequency, etc). The measurement

then computes the central channel RMS power as an absolute and the adjacent channel powers relative to this from the FFT spectrum. Four adjacent channels are examined (two either side of the central channel). In manual mode up to 99 channels can be specified each with arbitrary channel spacing and channel width.

**Occupied Bandwidth:** is calculated from the FFT spectrum by a function that returns the bandwidth in which a user defined percentage of the total signal power is occupied.

The FFT spectrum can be configured as either RMS averaged or peak hold in which case the function will output an averaged result or retain peak values if repeatedly called. The number of averages is user defined.

**Markers:** A marker power function is provided together with a marker peak find and a next peak search function. These enable measurement of discrete signals within the FFT spectrum.

**Time Domain:** Time domain analysis functions include computation of average power of a range of IQ data samples plus power and frequency versus time. The time window for analysis can be the entire IQ sample array or any user defined subset.

The underlying analysis library components of the spectrum measurement .dll are also provided. These are hardware independent functions that can be used to develop bespoke spectrum analysis applications. To assist with programming, source code examples and user help are provided for a wide variety of different applications development environments including LabView, LabWindows CVI, VB and Visual C.

### Optional Measurement Suites

Measurement suites are also available for measurement of GSM/EDGE, WiMAX WLAN, UMTS uplink, Bluetooth, LTE FDD/TDD, TD-SCDMA, cdma2000 FM reverse link and Generic PSK/ transmissions. (See separate datasheets for 3030 options). These provide measurement of power, modulation quality and spectrum parameters in accordance with the relevant standards for mobile terminal testing, ideal for both production line and development laboratory use. Each application library is supplied with example source code to help familiarize the user.

### Customer Support

Users can elect to purchase PXI modules with optional warranty extensions. Standard extended warranty provides either a 36 month or 60 month 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 303x specifications are defined when used in conjunction with the 3010/11 RF Synthesizer PXI module and driver software supplied with the module.

Note: Not all functionality described below is exposed in the Aeroflex software applications provided but is available in the programming user interfaces.

## FREQUENCY

### Range

RF input:

3030A 330 MHz to 3.0 GHz

3030C 250 kHz to 3.0 GHz

3035 330 MHz to 6.0 GHz

3035C 250 kHz to 6.0 GHz

3036 250 kHz to 13 GHz

IF input: (3030A/3035 only)

Centered on 77.76 MHz

### Resolution

≤3 GHz: 1 Hz

>3 GHz, ≤6 GHz: 2 Hz

>6 GHz, ≤9 GHz: 3 Hz

>9 GHz: 6 Hz

### Accuracy

As per frequency reference

### Settling Time (LIST mode)

Typical times taken to be settled at final frequency

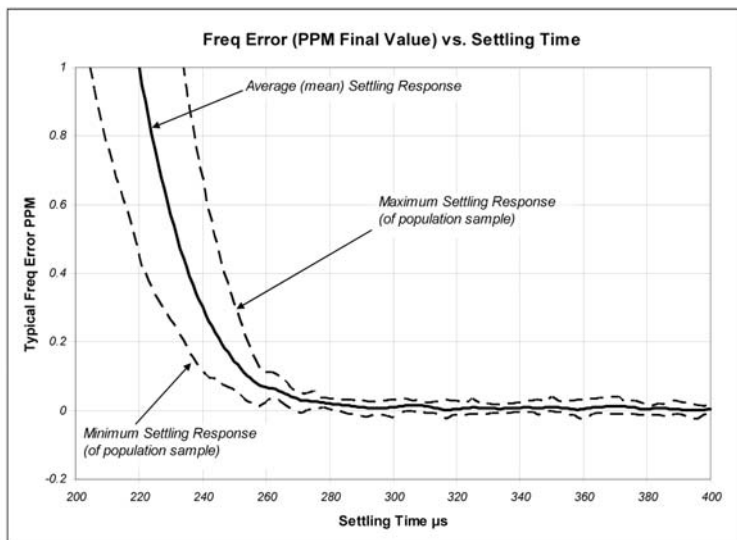
3010 Loop bandwidth		3030A/ 3035	3030C/3035C	
			<500 MHz	>500 MHz
Normal	3010 opt 01 fitted	250 μs	2 ms	325 μs
	3010 opt 01 not fitted	1.1 ms	3 ms	1.2 ms
Narrow		10 ms		

Up to 3 GHz settled to 0.7 ppm or 1 kHz whichever is the smaller

>3 GHz, ≤6 GHz settled to 2 kHz

>6 GHz, ≤9 GHz settled to 3 kHz

>9 GHz settled to 6 kHz



Typical frequency settling for 3030C/3035C/3036

Response is a composite of 10 devices at different settling frequencies. Freq error direction has been adjusted where necessary to display a positive response.

## LEVEL

### Input Coupling

AC coupled

### Maximum RF Input Power

Model	Maximum Input Power (dBm)	RF Attenuation (dB)	Conditions
3030A	+22	8	
	+20	4	
	+16	0	
3035	+30	10	10 dB IF Attenuation
3030C	+30	10	
3035C			
3036			

Max IF input (3030A/3035 only)

+10 dBm with 0 dB IF attenuation

### RF Input Attenuator

3030A 0 to 28 dB in 4 dB steps

3030C/3035/3035C/3036 0 to 31 dB in 1 dB steps

### IF Attenuator

0 to 35 dB in 1 dB steps

### RF Input Return Loss (typical)

3030A Typically 16 dB (8 dB input attenuation)

3030C/3035/3035C/3036 ≤6 GHz, 16 dB

>6 GHz, ≤10.5 GHz 14 dB

>10.5 GHz, ≤13 GHz 10 dB

## Level Accuracy (RF input, 23°C ±5°C)

Valid for signals with <5 MHz occupied bandwidth at the tuned frequency and S/N ratio >40 dB

Frequency	3030A	3035	3030C	3035C	3036
<500 MHz	<±0.6 dB, typically ±0.3 dB		<±1.0 dB, typically ±0.5 dB		
≥500 MHz, ≤3 GHz			<±0.7 dB, typically ±0.3 dB		
>3 GHz, ≤6 GHz	N/A	<±1.0 dB	N/A	<±1.0 dB	
>6 GHz	N/A	N/A	N/A	N/A	<±2.0 dB

For 3030C / 3035C and 3036 Level accuracy is unspecified with RF attenuation set to >16 dB AND the pre-amplifier set to enabled.

## Level Temperature Stability

3030A ±0.01 dB/°C

3030C/3035/3035C/3036 ≤6 GHz ±0.02 dB/°C

>6 GHz ±0.06 dB/°C

## Level Repeatability

After warm up following a return from a change in frequency or level. Valid for at least 2 hours and excluding temperature influence

3030A <±0.05 dB

3030C/3035/3035C/3036 ≤6 GHz <±0.08 dB

>6 GHz <±0.15 dB

## Level Settling Time (list mode and front end mode auto)

Frequency	dB error from final settled level at				
	3030A	3035	3030C	3035C	3036
≤3 GHz	±0.3				
>3 GHz, ≤6 GHz		±0.3		±0.5	
>6 GHz				±1.0	±0.5

## LIST MODE

### List Mode Channel Parameters

Frequency, level (defined as input level or as RF and IF attenuator settings), dwell period (in output samples)

### List Addresses

128 numbered 0 to 127

### Settling Time

See frequency and level data

### Address Sources

Manual (software commanded)

External (hardware triggered)

Internal (counter timer)

### External Mode Trigger Sources

PXI trigger bus, star trigger, PXI local bus, LVDS aux 1 to 5, TTL+ve, TTL-ve

### Counter Mode (Internal)

Time mode (common to all channels) dwell time 250 μs to 10 seconds with resolution 0.1 μs

Sample Mode (Channelized): up to 232 output samples

## SPECTRAL PURITY

### SSB Phase Noise (Typical, dBc/Hz)

FC	2 GHz		5 GHz	12 GHz
	Loop Bandwidth			
Offset	Narrow	Wide	Narrow	
100 Hz	-55	-85		
1 kHz	-85	-103		
10 kHz	-114	-103		
20 kHz	-116	-110	-108	-100
100 kHz	-133	-130		
1 MHz	-136	-136		
10 MHz	-138	-138		

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

## LINEARITY AND NOISE

(Specifications apply to RF input)

### Third order Intermodulation

2 CW tones at up to 0 dBm per tone, 500 / 1500 / 5000 kHz spacing, manual mode, No Pre-amplifier

Typically 75 dB<sup>1</sup>

<sup>1</sup>Tuned Frequency  $\geq 30$  MHz for 3036

### Adjacent Channel Leakage Ratio (ACLR) in any 3GPP frequency band <3

3030A/3035:

Better than 63 dB ACLR on 3GPP (downlink test model 1)

Typically 68 dB ACLR on 3GPP uplink

3030C/3035C/3036:

Better than 60 dB ACLR on 3GPP downlink (test model 1)

Typically 65 dB ACLR on 3GPP uplink

### Spurious (typical excluding IF image frequencies and harmonic responses)<sup>(1)</sup>

3030A/3035:

-75 dBc

3030C/3035C/3036:

-70 dBc

(1) Spurious specification applies for signals input within the analysis bandwidth at the Digitizer reference level

### Harmonic Distortion

3036: Typical performance for tuned frequency= 2nd Harmonic of Incident Frequency

RF Attenuation = 31 dB. No pre-amplifier

Incident Power	Harmonic distortion (dBc) 2nd Harmonic of Incident Frequency				
	850 MHz	1900 MHz	2500 MHz	5000 MHz	6500 MHz
0 dBm	-78	-88	-65	-72	-70
-5 dBm	-83	-95	-72	-76	-75
-10 dBm	-90	-100	-79	-82	-78

### Residual Responses (no signal input)

No signal input, RF input terminated into 50 ohms and minimum RF and IF attenuation

$\leq 6$  GHz <-95 dBm, typically -100 dBm.

>6 GHz typically <-95 dBm

### Noise Spectral Density dBm/Hz (Displayed average noise level [DANL])

No signal input, RF input terminated into 50 ohms and minimum RF and IF attenuation, pre-amplifier on (model dependent)

Frequency (within operating range)	3030A	3035	3030C	3035C	3036
<500 MHz	<-145, -152 Typ.		<-135, -148 Typ.		
$\geq 500$ MHz, $\leq 1$ GHz		<-135, -140 Typ.	<-140, -147 Typ.		<-140, -147 Typ.
>1 GHz, $\leq 3$ GHz	<-140, -150 Typ.				
>3 GHz, $\leq 5.8125$ GHz					
>5.8125 GHz, $\leq 6$ GHz					<-137, -147 Typ.
>6 GHz					

## IF OUTPUT (3030A, 3035 ONLY)

### Frequency center

3030A/3035 77.76 MHz

### Level

3030A:

Relative to RF input (0 dB input attenuation selected)

Typically -3 dB between 330 MHz to 2.5 GHz

Typically -5 dB between 2.5 GHz to 3 GHz

3035:

Nominally -4 dB relative to RF input (0 dB input attenuation selected)

### Bandwidth

Typically 100 MHz (-3 dB)

## A/D CONVERSION

### Resolution

3030A/3035 14 bits

3030C/3035C/3036 13 bits

### ADC Clock

3030A/3035 103.68 MHz

3030C/3035C/3036 250 MHz

### Sample Rate Control

IF Data: same as ADC clock

IQ Data:

3030A/3035<sup>1</sup> 6328.125 Sa/s to 85 MSa/s or 51.84 MSa/s with LVDS output enabled

3030C/3035C/3036 15.3 kSa/s to 250 MSa/s or 90 MSa/s with LVDS output enabled

(1) LVDS output sample rate is limited to a max. of 5MSa/s with option 198 enabled.

### Sample Rate Resolution

0.1 Hz when the sample rate is entered as a real number

Sample rate can be entered as a fraction made up of integers

### Sample Rate Accuracy

As per 10 MHz ref<sup>(1)</sup>

<sup>(1)</sup> add  $\pm 2$   $\mu$ Hz when using generic re-sampling mode

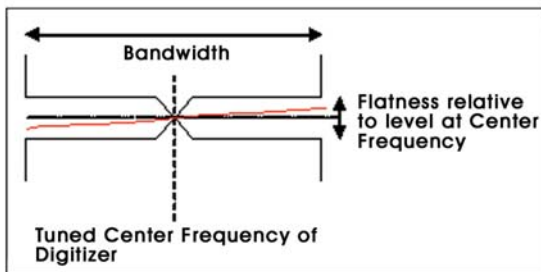
**Amplitude Flatness (correction on)**

Model	3030A		
Operating Frequency	Bandwidth (MHz)		
	<±0.1 dB Flatness	<±0.25 dB Flatness	<±1.0 dB Typ. Flatness
≤3 GHz	5	30	36

Model	3035			
Operating Frequency	Bandwidth (MHz)			
	<±0.1 dB Flatness	<±0.25 dB Flatness	<±0.4 dB Flatness	<±1.0 dB Typ. Flatness
≤2.9 GHz	5	33		36
>2.9 GHz, ≤6 GHz			33	

Model	3030C/3035C		
Operating Frequency	Bandwidth (MHz)		
	<±0.1 dB Flatness	<±0.25 dB Flatness	<±1.0 dB Typ. Flatness
<500 MHz	5	15	20
≥500 MHz, ≤1 GHz		33	36
>1 GHz, ≤6 GHz		67	90

Model	3036			
Operating Frequency	Bandwidth (MHz)			
	<±0.1 dB Flatness	<±0.25 dB Flatness	<±0.65 dB Flatness	<±1.0 dB Typ. Flatness
<500 MHz	5	15		20
≥500 MHz, ≤1 GHz		33		36
>1 GHz, ≤13 GHz			67	90



Definition of Amplitude Flatness used

**Phase Flatness (typical with correction on)**

3030A/3035	±0.03 radians pk-pk to 33 MHz
3030C/3035C/3036:	
<500 MHz	±0.03 radians pk-pk to 15 MHz
≤1 GHz	±0.03 radians pk-pk to 36 MHz
>1 GHz	±0.03 radians pk-pk to 67 MHz

**Data Output**

A sample data block (equal to the data capture length) can be stored to the memory internal to the 3030 and then transferred to the controller via the PCI bus. Sample data can be continuously streamed out of the LVDS connector.

IF data samples have 16 bit resolution.

IQ data samples can be 16 or 32 bit resolution.

Note IF data output to LVDS is not supported on 3030, 3035C or 3036

**Sample Memory**

3030A/3035	128 M x 16 bit samples
3030C/3035C/3036	256 M x 16 bit samples

**TRIGGERING**

**Trigger Mode**

Single, repeat

**Trigger Type**

Edge, gated, none (software triggered)

**Hardware Trigger Sources**

Internal IF or IQ data (with user defined level threshold) and timer

External (LVDS, Trig bus, local bus, star trigger, TTL)

**Trigger Polarity**

+ve or -ve (Edge trigger), Gate high, Gate low (Gated trigger)

**Trigger Functions**

**Pre-trigger**

0 to sample length

**Delayed Trigger**

0 to + 2 G samples

**Trigger Latency**

0 to 1 sample at the output sample rate

**Trigger hold off (303xC modules only)**

Min trigger hold-off: 0 (default)

Max trigger hold-off: 65536 (0xFFFF) μs in steps of 1 μs

**SPECTRUM ANALYZER PLUGIN**

This Windows™ application software is designed for minimum screen resolution of 1024 x 768 useable for 600 x 800

**Frequency Span Range**

Variable between 2 kHz to 200 MHz and zero span

Resolution 1 Hz

**RBW**

Variable between 1 Hz to 10 MHz

Resolution 1 Hz

**Window Type**

NEBW: Gaussian 3 dB: Gaussian fixed: Blackman Harris 5 term

**Sample Time**

Up to 333 seconds

Resolution 1 ns

**Measurements**

**Channel Power and Adjacent Channel Power**

Adjacent channels: 2 upper and 2 lower or user defined up to 99

Channel filter alpha: 0.0 to 1.0

Channel spacing: up to 15 MHz

Channel width: up to 25 MHz

#### Occupied Bandwidth (OBW)

Percentage range: 1% to 99.99%

#### N Peaks

Frequency and power output for up to 10 signal peaks sorted in order of descending power

#### Average Power

The RMS average power for all IQ samples

#### Markers

4 markers plus delta marker

#### Marker Functions

Marker power and frequency with peak search, next peak, peak track

Power and time

Frequency and time

#### Traces

Live, avg, max. hold

Spectrum trace, power versus time trace, frequency versus time trace

Text results summary

## INTERFACES

#### 3010/11: PXI 1 compatible module

LO output (SMA)

10 MHz reference I/O (SMA x 2)

#### 3030A/3035 PXI 1 compatible module

RF input, (SMA)

Local oscillator input (SMA)

IF output and input (SMA\*2)

10 MHz reference (SMA\*2)

IF or IQ 16 bit LVDS data (VHDCI)

TTL trigger (SMB)

#### 3030C/3035C/3036 PXIe Hybrid compatible slot module

RF input, (SMA)

Local oscillator input (SMA)

10 MHz reference (SMA\*2)

IF or IQ 16 bit LVDS data (VHDCI)

TTL trigger (SMB)

## POWER CONSUMPTION (TYPICAL)

	3010/3011	3030A	3035	3030C	3035C	3036
+3.3v	50 mA	3 A	3 A	2.2 A	2.2 A	2.1 A
+5v	650 mA <sup>(1)</sup>	1.5 A	2 A	3.1 A	4.1 A	4.55 A
+12v	50 mA <sup>(2)</sup>	300 mA	300 mA	350 mA	350 mA	700 mA
-12v	30 mA	150 mA	150 mA	50 mA	50 mA	100 mA
DC power		23 W	26 W	27.5 W	32.5 W	39.3 W

<sup>(1)</sup> 250 mA transiently during power up

<sup>(2)</sup> 3011 OCXO requires 300 mA startup reducing to 150 mA after 5 minutes

## DIMENSIONS AND WEIGHT

#### Dimensions

3010/11 Single width 3U PXI module

3030/3030A/3030C /3035 Double width 3U PXI module

3035C/3036 Triple width 3U PXI module

#### Weight

3010 375 g (0.8 lbs)

3011 390 g (0.86 lbs)

3030A/3030C/3035 750 g (1.7 lbs)

3035C 1060 g (2.3 lbs)

3036 1110 g (2.5 lbs)

## FREQUENCY REFERENCE

#### Source

3030A/3035:

External (front panel SMA), Internal (free running)

3030C/3035C/3036:

External (front panel SMA), Internal (PXI backplane)

#### Frequency

10 MHz

#### Level

3030A/3035:

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

3030C/3035C/3036:

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

## GENERAL

The following general specifications are common to the 3010, 3011 and 303x.

#### Standard Warranty

24 months

#### Calibration Interval

Recommended 24 months

#### Electromagnetic Compatibility

EN 61326-1:2006, Emissions Class A Immunity Table 1

#### 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

## LOCAL OSCILLATOR INPUT

#### Frequency Range

1500 MHz to 3000 MHz

#### Level

303x input: Nominally 0 dBm

## 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, tested to 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 hardware specification, revision 2.2, ECN 1 revision 1.0. PXI software specification revision 2.1 VXI plug & play specifications (VPP-2, VPP-3.x, VPP-4.x and VPP-7)

3035/3035 PXI-1 type module

303xC/3036 PXIe Hybrid Slot compatible module

## 3010/3011 CONDENSED SPECIFICATIONS

Specifications are common to the 3010 and 3011 unless otherwise stated.

Refer to 3010 Series datasheet for full specification.

## LOCAL OSCILLATOR OUT

### 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

## FREQUENCY REFERENCE OUT (3011 ONLY)

### Level

2 V pk-pk nominal square wave into 50 ohms

### Frequency

10 MHz

### Aging Rate

1 in 10<sup>9</sup> per day, 1 in 10<sup>7</sup> per year

### Temperature Stability (0°C to 50°C)

Typically better than ±1 x 10<sup>-8</sup>

### Warm-Up Time

<5 Minutes

## VERSIONS, OPTIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

### Ordering

#### Numbers

3030A

3030C

3035

3035C

3036

3010

3011

#### Versions

PXI wideband RF digitizer 330 MHz to 3 GHz

PXI wideband RF digitizer 250 kHz to 3 GHz

PXI wideband RF digitizer 330 MHz to 6 GHz\*

PXI wideband RF digitizer 250 kHz to 6 GHz

PXI wideband RF digitizer 250 kHz to 13 GHz

\* Note subject to export control unless option 198 is fitted

PXI RF synthesizer

PXI RF synthesizer (including OCXO 10 MHz reference)

#### Each supplied with

The 3030 Series and 3010/11 are each supplied with:

CD ROM containing drivers, PXI Studio application software, Spectrum Analyzer measurement plug-in and user documentation

CD ROM containing factory test data and calibration certificate

SMA-SMA Link cables

3010/3011 x2 43139/738 (130mm)

3030A/3035 x2 43139/738 (130mm)

3030C x1 43139/738 (130mm)

3035C/3036 x1 43139/739 (180mm)

#### Options

3010/11 Opt 01 High speed frequency switching (subject to export control)

3030 Opt 198 Limit LVDS output sample rate to 5 MSa/s (applies to 3035 only)

Optional measurement suites (each supplied on a separate CDROM)

See separate data sheets

3030 Opt 100 GSM/EDGE measurement suite

3030 Opt 101 UMTS UL uplink measurement suite

3030 Opt 102 CDMA2000/1xEV-DO reverse link measurement suite

3030 Opt 103 WLAN measurement suite

3030 Opt 104 WiMAX OFDMA measurement suite

3030 Opt 106 Bluetooth measurement suite

3030 Opt 107 LTE FDD measurement suite

3030 Opt 108 LTE TDD measurement suite

3030 Opt 109 TD-SCDMA measurement suite

3030 Opt 111 Generic measurement suite

**When purchased as an upgrade, order as:**

RTROPT100/3030	GSM/EDGE enable
RTROPT101/3030	UMTS uplink enable
RTROPT102/3030	CDMA2000/1xEVDO reverse link enable
RTROPT103/3030	WLAN enable
RTROPT104/3030	WiMAX OFDMA enable
RTROPT106/3030	Bluetooth enable
RTROPT107/3030	LTE FDD enable
RTROPT108/3030	LTE (TDD) enable
RTROPT109/3030	TD-SCDMA enable
RTROPT111/3030	Generic Measurement enable

**Service Options**

W3010/103	3010 Standard extended warranty 36 months
W3030/103	3030 Standard extended warranty 36 months
W3010/103C	3010 Standard extended warranty 36 months with scheduled calibration
W3030/103C	3030 Standard extended warranty 36 months with scheduled calibration
W3010/105	3010 Standard extended warranty 60 months
W3030/105	3030 Standard extended warranty 60 months
W3010/105C	3010 Standard extended warranty 60 months with scheduled calibration
W3030/105C	3030 Standard extended warranty 60 months with scheduled calibration

**Optional Accessories**

43139/738	SMA link cable (130 mm)
43139/739	SMA link cable (180 mm)
43139/783	SMA link cable assembly (230 mm)
23435/698	68 way VHDCI to SCSI-3 cable assy 1.8 m
23435/699	68 way VHDCI to VHDCI cable assy 1.8 m
46885/224	SMA connector saver

For the very latest specifications visit [www.aeroflex.com](http://www.aeroflex.com)

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