

PXI Modules

3050A/3320 PXI Low Noise RF Signal Generator and Dual Channel AWG



- Frequency range 100 kHz to 3 GHz or 6 GHz
- Output level -120 to +10 dBm or +20 dBm
- 200 MHz IQ Vector modulation bandwidth
- 70 dB ACLR (WCDMA test model 1)
- Fast frequency / level switching time typically 100 μ s
- List mode operation
- Low SSB phase noise
 - <-135 dBc/Hz @ 20 kHz offset, 1 GHz carrier
 - <-152 dBc/Hz @ >10 MHz offset
- Phase coherent LO input and output
- FM/Phase modulation
- Up to 4 GByte AWG memory
- Internal OCXO 10 MHz frequency reference
- PXI Studio and IQCreator software tools

Introduction

3050A is a compact, low noise and highly agile RF signal generator that is configurable to address a broad range of applications across a wide variety of industries.

3320 is a dual channel arbitrary waveform generator used to provide I and Q inputs when 3050A is configured with optional vector modulation.

3050A and 3320 are 5th generation PXI RF modular instruments from Aeroflex and the perfect complement to 3070A high performance RF Digitizer, (see separate specification).

The superior performance of 3050A and 3320 make them ideal for the most demanding applications in radio communications. Notably, the synthesizer technology used in 3050A delivers exceptionally low phase noise and fast frequency switching making it ideal for use in high volume manufacturing test systems for RF components.

Wide Frequency and Level Range

The frequency range and level range of 3050A are configurable. The basic model operates over a frequency range 100 kHz to 3 GHz with output power ranging from -120 dBm to +10 dBm. Frequency and level can optionally be extended to 6 GHz and +20 dBm respectively.

The frequency range can be extended as a field upgrade using a simple pass key activation code without need for recalibration.

Excellent Spectral Purity

With SSB phase noise performance of -135 dBc/Hz at 20 kHz offset from a 1 GHz carrier and a floor noise of <-152 dBc/Hz, the 3050A is ideally suited for applications such as phase noise testing, demanding receiver selectivity measurements, LO substitution in receivers and transmitters and RF component testing.

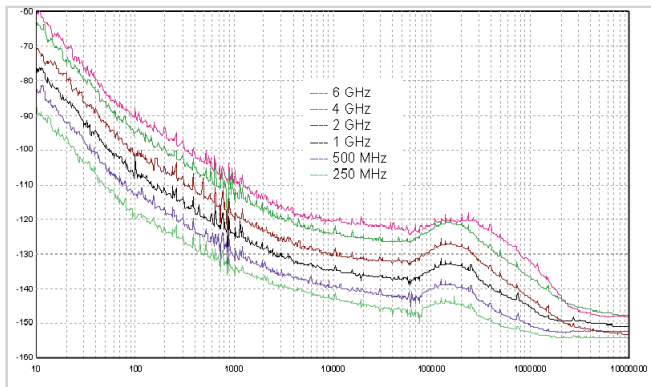


Figure 1. Typical phase noise

Phase Coherent LO Output and MIMO

A phase coherent LO output is available which can be used to substitute as the LO input to other 3050A modules to produce multi carrier phase coherent signals for testing MIMO receivers or phased array antennas.

When used with 3320 Dual AWG each of the signal generators RF output waveforms can be synchronised in time to support applications in MIMO testing.

Fast Frequency Switching

The 3050A is capable of switching between frequencies in under $100\mu\text{s}$ whilst maintaining excellent phase noise characteristics. Using List mode frequency settings can be pre-calculated and stored in on-board memory for fast access based on hardware triggers.

Fast Level Settling

The fast frequency settling time is complemented by a high speed electronic attenuator and levelling loop with excellent linearity, monotonicity and repeatability. The settling time following a change in RF output level is under $100\mu\text{s}$ to within 0.1 dB of the final settled level.

Sweep

Frequency and/or level sweeps can be generated for applications in device characterisation. Once the sweep settings are entered, all hardware conditions are calculated and stored to ensure optimal level accuracy.

List Mode

Fast level and frequency switching times are harnessed within a List Mode which supports in excess of 65,000 addresses. Each list address can be independently configured for frequency, level and modulation.

Vector Modulation

High quality vector modulation provides a maximum RF bandwidth of 200 MHz when used with the 3320 dual channel AWG module and better than 55 dB of image and carrier suppression. Together with the excellent phase noise performance of 3050A they combine to achieve a signal output with very low residual EVM. For example figure 2 and 3 illustrate the performance for WLAN 802.11ac (MCS9 256 QAM) VHT signals with either 80 MHz or 160 MHz bandwidth in the 5 GHz frequency band.

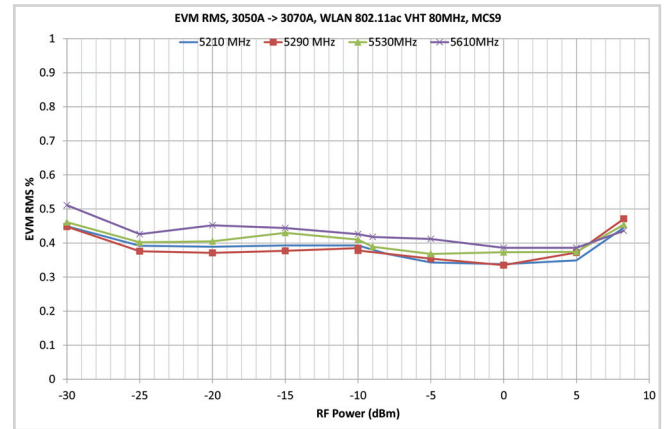


Figure 2. Measured EVM using 3070A to measure 3050A/3320

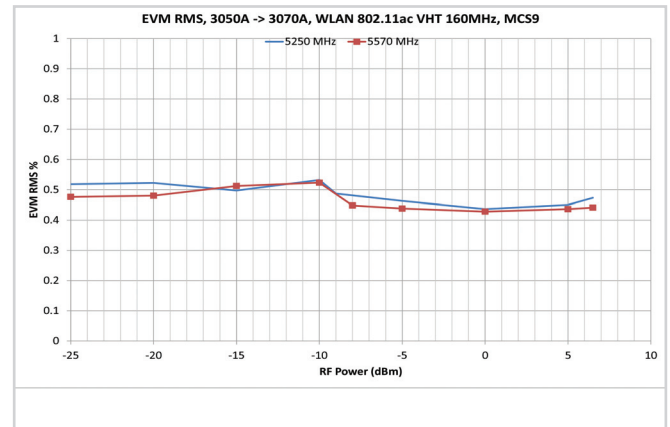


Figure 3. Measured EVM using 3070A to measure 3050A/3320

Linearity

ACLR performance of <-70 dBc is achieved with 3320 producing WCDMA downlink Test model 1 signals. This makes 3050A+3320 ideal for testing amplifiers and transmitters used in 3G and other technologies.

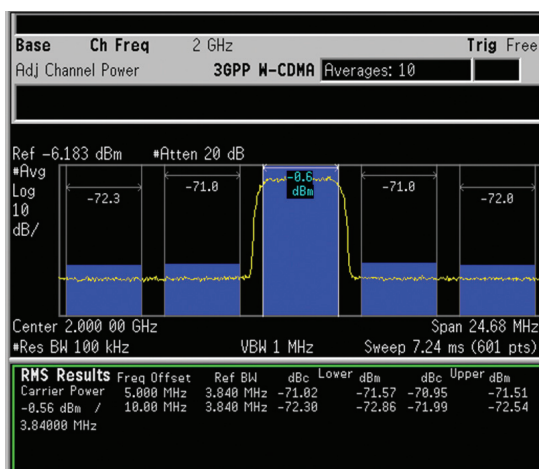


Figure 4. ACLR with 3GPP test model 1 64 chans ver3.2

FM Modulation

3050A can support wideband frequency or phase modulation from an external modulation input. The wideband frequency modulator supports deviations up to 20 MHz for carriers above 3 GHz and 10 MHz for carrier below 3 GHz from an externally applied modulation source.

Dual Channel AWG

3320 provides analog I&Q modulation inputs to 3050A when configured for IQ Vector Modulation.

3320 interfaces with 3050A through 100 MHz (-0.5 dB) bandwidth differential analog I & Q. 3050A and 3320 are calibrated as a matched pair to ensure optimal modulation quality for bandwidths up to 200 MHz.

Waveform Memory

Up to 4 Gbytes (1 Gsamples) of memory is provided, each 32 bit sample word consisting of 14 bit I, 14 bit Q and 4 bit marker data. This provides a maximum file play time of 4 seconds at the maximum sample Rate of 250 MHz. The AWG memory can be used to store a catalog of waveforms up to the limit of the sample memory. Loading waveforms from the system controller is performed at runtime. Up loading is made very fast by virtue of the wide bandwidth of the PXI backplane.

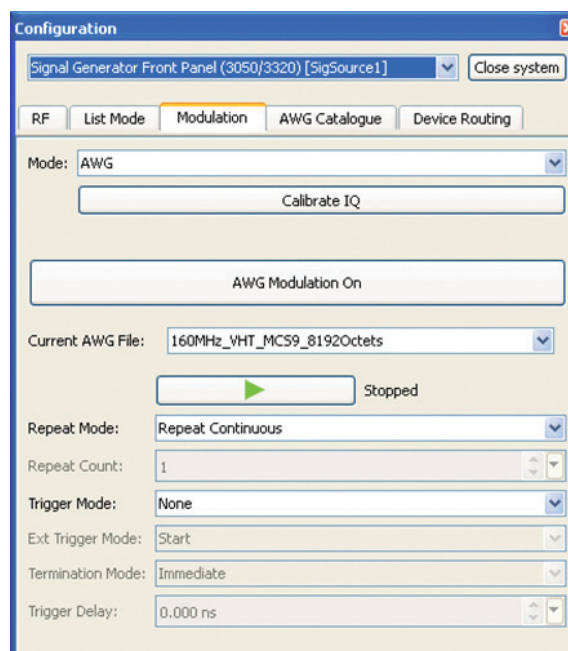
Various waveform triggering modes. Each waveform may be selected to play continuously or for a specified number of repeat cycles in response to an external trigger and then stop. In start/stop mode a trigger is used to initiate playing of the waveform which will play continuous until triggered to stop. In gated mode, a waveform is played until the trigger line changes state. In retriggered mode, the waveform plays and then restarts in the event of a new trigger event.

Additional facilities are provided that alter the behaviour for Start/Stop and Retriggered mode whereby the trigger event is either acted upon immediately or is acted upon on completion of the current file play cycle.

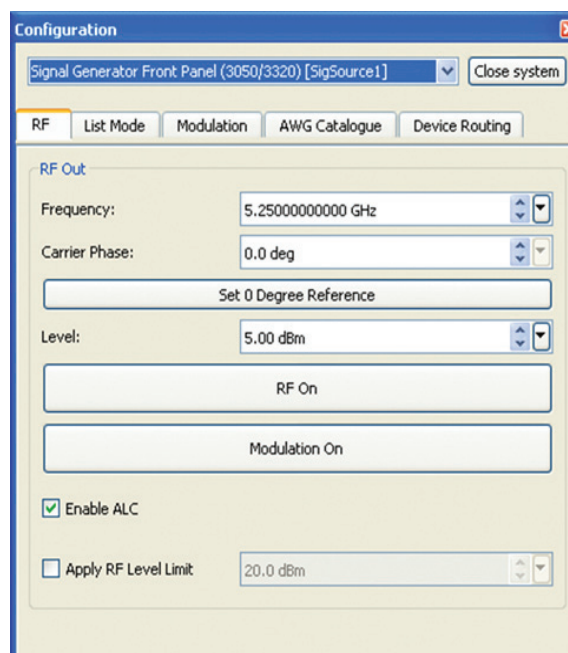
Driver and Application Software

A VXI PnP driver is supplied with C.dll and .NET programming interfaces for user application development.

The 3050A is also supported by the PXI Studio 2 application which allows simultaneous control of the 3050A together with other Aeroflex 3000 Series PXI module and measurement applications.



Modulation Settings



RF Settings

Figure 5. PXI Studio UI examples

3320 is supported by IQCreator, a Windows™ application with templates for designing generic or system specific complex modulation waveforms or for packaging a users own IQ vectors into a format compatible for use with Aeroflex PXI 3000 modules.

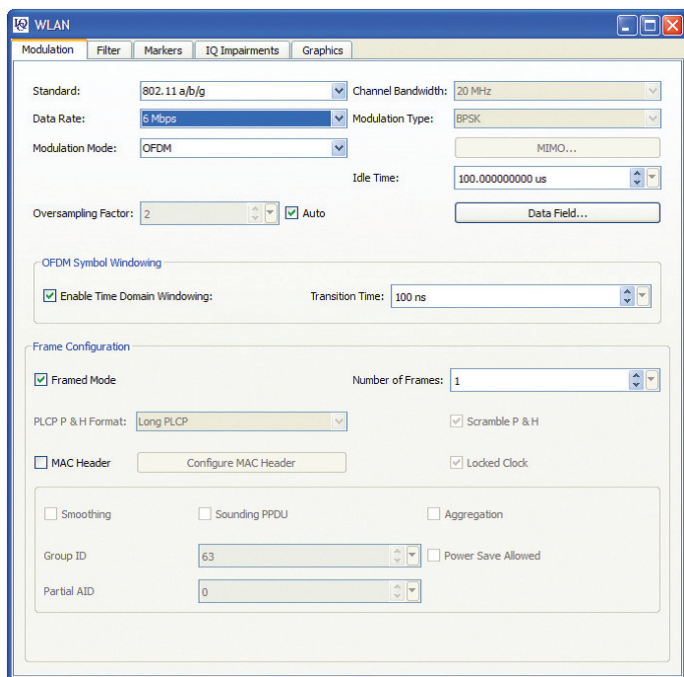


Figure 6. IQCreator WLAN Waveform Generation template

SPECIFICATION

Specifications apply when used in conjunction with the driver software supplied with the module or a later version.

All specifications apply when the module is used in a PXI standard compliant chassis following a warm up period of 30 minutes.

I & Q modulation performance is specified when used with a paired PXI 3320 Dual Channel Arbitrary Waveform Generator

Specifications are warranted unless marked as (typ)

Parameters indicated as measured performance are not routinely measured.

3050A RF OUTPUT

FREQUENCY

Range

- 100 kHz – 3 GHz standard
- 100 kHz – 6 GHz with option 03 enabled

Resolution

- 0.01 Hz

Accuracy

- As per frequency reference

Settling Time (list mode)

- <150 μs, typ 100 μs to within 0.1 ppm of final frequency (or 30 Hz, whichever is greater)

PHASE

Range

- 0 to 359.9 degrees in 0.01 degree steps

LEVEL

Coupling

- AC coupled

Max DC Input

- ±16V

Max Reverse Power

- +25 dBm

Output Level Range (PEP)

Standard (dBm)	High power option 04 fitted (dBm)
-120 to +10	-120 to +20 >50 MHz
	-120 to +17 ≤50 MHz
	-120 to +15 ≤10 MHz
	-120 to +13 ≤1 MHz

Resolution

- 0.01 dB

Accuracy (+23°C ±5°C for CW signals)

Frequency	Set level (dBm)	Accuracy (dB) ⁽¹⁾
≤50 MHz	≥-110	≤±0.7, ±0.33 typ
	<-110	≤±1.0, ±0.7 typ
>50 MHz – ≤3 GHz	>-90	≤±0.5, ±0.25 typ
	<-90	≤±0.6, ±0.33 typ
	<-110	≤±1.0, 0.7 typ
>3 GHz	≥-100	≤±0.7, ±0.4 typ
	<-100	≤±0.9, ±0.6 typ
	<-110	≤±1.2, ±0.9 typ

⁽¹⁾Add -0.2 dB for modulated signals

Temperature Stability

- 0.025 dB/°C

Settling Time (List Mode)

- <100 μs to within 0.1 dB of final level or <150 μs when coincident with a frequency change.

Repeatability

- Better than ±0.05 dB (excluding temp influence)

- Specified after warm up following a return from a change in frequency or level valid for >2 hours

Monotonicity

- ±0.05 dB >-30 dBm
- ±0.05 dB typ <-30 dBm
- ±0.2 dB typical at +4 dBm and +10 dBm

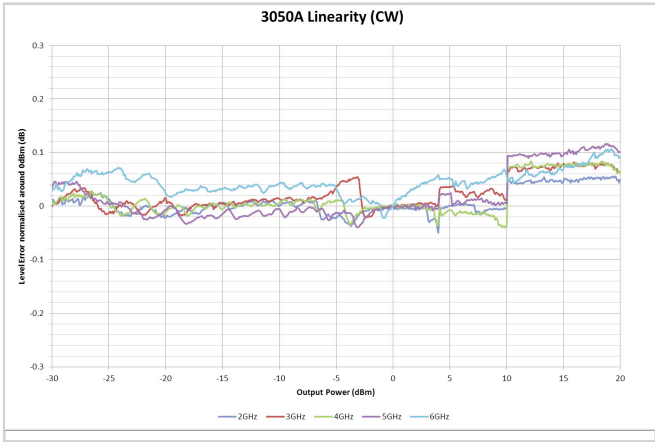


Figure 7. Example plot of 3050A linearity (monotonicity) normalised at 0 dBm

Output Impedance

- Nominally 50 ohm

Output VSWR (typ)

	RF Output Level	
	< +4 dBm	> +4 dBm
1 MHz to 50 MHz	1.3:1	1.4:1
50 MHz to 3 GHz	1.4:1	1.5:1
>3 GHz	1.5:1	1.6:1

SPECTRAL PURITY

Single Sideband Phase Noise (dBc/Hz) (typ)

Carrier	Offset		
	1 kHz	20 kHz	10 MHz
100 MHz	-132	-142	-152
250 MHz	-131	-142	-152
500 MHz	-125	-138	-152
1 GHz	-119	-135	-152
2 GHz	-113	-124	-152
4 GHz	-107	-120	-142
6 GHz	-103	-117	-137

Residual FM (typ)

<1 Hz RMS deviation measured in a 300 Hz to 3.4 kHz un-weighted bandwidth at 1 GHz

Non-harmonic Spurious Signals at >10 kHz offset CW

Frequency (GHz)	Spurious (dBc)
≤1	<-80
≤2	<-70
≤2.6	<-68
≤5.8	<-65
>5.8	<-60

Harmonics (≥1 MHz)

Output Level (dBm)	Rejection (dBc)
≤-0	<-30
≤+9	<-30 (typ)

Sub-Harmonics (CW) + 3f/2 Spurious

Frequency (GHz)	Rejection (dBc)
≤1.5	<-80
≤3	<-75
>3	<-40

RF Leakage

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

Jitter

RMS Jitter Frequency	RMS Jitter Bandwidth	Measured Performance
1 GHz	1 Hz – 10 MHz	450 fs.
155 MHz	100 Hz – 1.5 MHz	58 fs.
622 MHz	1 kHz – 5 MHz	31 fs.
2.488 GHz	5 kHz – 15 MHz	25 fs.

LOCAL OSCILLATOR OUTPUT

Phase coherent un-modulated carrier

Frequency Range

50 MHz – 3 GHz (or 6 GHz with 3050A option 03 enabled)

Output Level

Nominally +12 dBm ±1 dB

Impedance

Nominally 50 ohms

LOCAL OSCILLATOR INPUT

Module can use an external LO source as a substitute for the internal LO

Frequency Range

50 MHz – 3 GHz (or 6 GHz with 3050A option 03 enabled)

Input Level

Nominally +11 dBm ±2 dB

Impedance

Nominally 50 ohms

INTERNAL MODULATION GENERATOR

Wave shape

Sine, Triangle, Square

Frequency Range

Up to 1 MHz

EXTERNAL MODULATION INPUT

Level

Nominally 1.414 V peak for set deviation

Input Impedance

50 ohms or 100 kohms

FREQUENCY MODULATION (EXTERNAL)

Frequency Band

Range	N
50 kHz-30 MHz	1
30.0-46.875 MHz	1/64
46.875-93.75 MHz	1/32
93.75-187.5 MHz	1/16
187.5-375 MHz	1/8
375-750 MHz	¼
750 MHz – 1.5 GHz	½
1.5 – 3 GHz	1
3 – 6 GHz	2

Maximum Input Level

2.5V peak

Maximum Deviation

FM mode 1 (low noise): N x 50 kHz

FM mode 2 (wideband): N x 10 MHz

Resolution

1 Hz

Accuracy (1 kHz mod rate)

±3% of set deviation

Frequency Response (-1 dB)

Low noise mode: 50 kHz

Wideband mode: 10 MHz

Total Harmonic Distortion (1 kHz mod rate)

<0.15% for deviations up to 2% of maximum deviation

<0.5% for deviations up to 20% of maximum deviation

PHASE MODULATION (EXTERNAL)**Maximum Phase Deviation**

FM mode 1 (low noise): $N \times 5$ radians

FM mode 2 (wideband): $N \times 100$ radians

Resolution

0.01 radians

Accuracy (1 kHz mod rate)

±3% of set phase deviation

Total Harmonic Distortion (1 kHz mod rate)

<0.5% for deviations up to 10 radians

<0.1% for deviations up to 1 radian

Frequency Response (-0.5 dB)

100 Hz – 10 kHz

VECTOR MODULATION (3050A OPTION 05)

3050A option 05 is specified when used with a paired PXI 3320 Dual Channel AWG module.

Input

I and Q inputs (I+, I-, Q+, Q-)

Input Impedance

100 Ω differential

Coupling

DC

Input Voltage

±0.5 Vpk (on 'I AND Q') or ±0.707 Vpk (on 'I OR Q') for calibrated RF output level

Maximum voltage on any input not to exceed ±2 V

Bandwidth (-3 dB) at RF Output

Frequency (MHz)	Bandwidth (MHz)
≤30	Up to 20
≤46	20
≤125	30
≤187	40
≤375	100
≤5800	200
>5800	200 (typ)

Residual Carrier Leak

Following a user calibration

Frequency (GHz)	Carrier Leak (dBc)
≤3.5	-55
>3.5	-50
>5.5	-45

IQ Image Suppression (typ)

Following user calibration with a paired PXI 3320

Tone Frequency (MHz)	Image Suppression (dBc)
0.1	-55 (-50 >5.5 GHz)
10	-50
30	-46
50	-43
80	-40

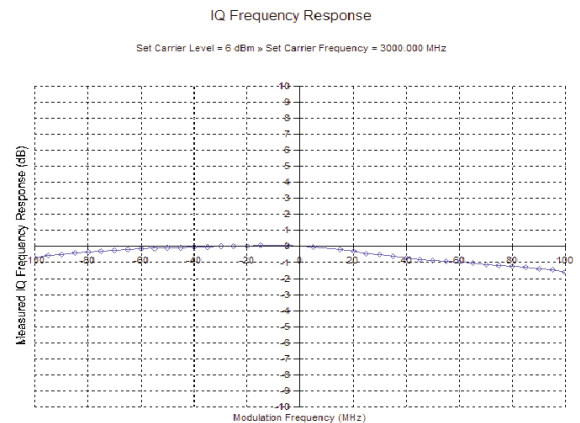


Figure 8a. Measured performance of IQ modulation bandwidth using PXI 3320 AWG at 3000 MHz

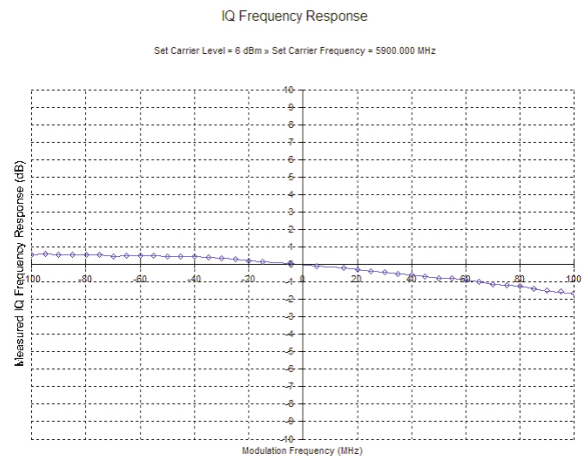


Figure 8b. Measured performance of IQ modulation bandwidth using PXI 3320 AWG at 5900 MHz

Linearity (with a paired PXI 3320)

Adjacent (ACLR) and Alternate (AltCLR) Channel Rejection Ratio,
WCDMA signals (downlink test model 1), -3 dBm output power

Frequency (MHz)	ACLR ± 5 MHz (dBc)	ACLR ± 10 MHz (dBc)
≥ 750 -1250	< -65	-72 typ
≤ 3250	< -68 typ -70	
≤ 4250	< -60	

Third Order Intermodulation Distortion (with a paired PXI 3320)

2 tones at 0 dBm per tone

Carrier Frequency (GHz)	Intermodulation Product (dBc)
≤ 1	-45
≤ 3.5	-50
> 3.5	-40

Error Vector Magnitude (using a paired PXI 3320)

Standard	GSM	EDGE	cdma2000 1xEV-DO	W-CDMA TM1	LTE E-TM3.1	IEEE 802.11			
Mod Type	GMSK	3pi/8PSK	QPSK		64 QAM			256 QAM	
Bandwidth	200 kHz		1.23 MHz	3.84 MHz	10 MHz	20 MHz	40 MHz	80 MHz	160 MHz
Mod Rate	270.833 kbps	270.833 kbps	1.2288 Mcps	3.84 Mcps		54 Mbps	HT	VHT MSC9	
Frequency (MHz)	849-1910					2412-2484	5170-5825		
Level (PEP)	<7 dBm								
Measured Values	0.32 degrees (rms) ⁽¹⁾	0.3% ⁽¹⁾	0.99 Rho ⁽¹⁾	0.6% ⁽³⁾	0.2% ⁽¹⁾	0.2% ⁽¹⁾	0.5% ⁽¹⁾	0.5% ⁽¹⁾	0.6% ⁽²⁾

⁽¹⁾ Measured using 3035C RF Digitizer

⁽²⁾ Measured using 3070A RF Digitizer

⁽³⁾ Measured using Agilent MXA

LIST MODE

List Mode Channel Parameters

Frequency, Level, FM state on/off, FM deviation, AWG on/off (when used with PXI 3320)

Number of List Addresses

65536

List Address Source

Software, External Serial, Internal Counter, PXI 3320

Dwell Time

161 μ s to 10 s

SWEEP⁽¹⁾

Parameters

RF Frequency and or Level

Sweep Modes

Continuous, single, ext triggered

Maximum Number of Points

65536

Trigger Source

Free run, External Step, Start sweep, Stop sweep

Synchronization Signals

“Start of Sweep” and “Step” pulses can be routed to the front panel or PXI trigger bus

⁽¹⁾ Sweep modes are exposed in PXI Studio only.

3320 ARBITRARY WAVEFORM GENERATOR

Number of Channels

x2 differential channels (channel 1 and 2)

DAC Resolution

16 bit

Sample Rate

8 kSa/s to <100 MSa/s (or 250 MSa/s per channel with 3320 option 03)

LEVEL

Output Level

Channel 1 & 2

1.0 V pk-pk differential into 100 ohms

Accuracy

Better than $\pm 0.5\%$ ± 0.5 mV

Output Bias Voltage (common mode offset)

Nominal 0 V

Output Bias Voltage Accuracy

± 2 mV

Differential Offset Voltage

0 V fixed

Differential Offset Accuracy

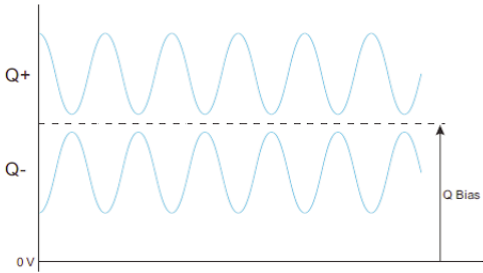
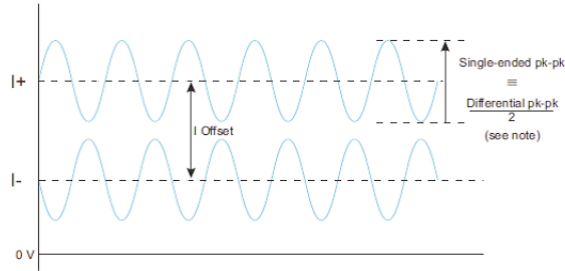
Better than ± 1 mV

Differential Signal Balance

Better than 0.25 dB at 40 MHz

Impedance

Differential; 100 ohm nominal



FREQUENCY RESPONSE / FLATNESS

Specified for each channel I+, I- Q+, Q- with respect to 15 kHz

±0.35 dB DC – 40 MHz per channel

±0.5 dB above 40 MHz (3320 option 03 enabled)

SPECTRAL PURITY

Spurious Free Dynamic Range

Better than 70 dB up to 80 MHz

Better than 62 dB up to 100 MHz

Image rejection

Better than -80 dB

Floor Noise (no output)

Better than -140 dBFS/Hz

Harmonics

2nd better than -70 dBc up to 40 MHz

better than -60 dBc above 40 MHz

better than -58 dBc above 80 MHz

3rd and higher

better than -70 dBc

THD (typical)

-68 dBc up to 40 MHz

-58 dBc above 40 MHz

-56 dBc above 80 MHz

IMD

Better than -70 dBc (100 kHz tone spacing @ 1 MHz, 200 kHz tone spacing @ 40 MHz)

Crosstalk

Better than -70 dB below 40 MHz

Better than -60 dB from 40 MHz

SSB Phase Noise (typical)

<-130 dBc/Hz (20 kHz offset with 100 MHz sine)

Jitter (measured value)

Integrated between 1 kHz to 1 MHz

0.6 ps <80 MHz

0.24 ps ≥80 MHz

MEMORY

512 MB 128 Msamples

1 GB 256 Msamples (3320 opt 004)

2 GB 512 Msamples (3320 opt 005)

4 GB 1 Gsamples (3320 opt 006)

WAVEFORM PLAYTIME (AT MAX SAMPLE RATE)

0.5 seconds

1 seconds with 3320 opt 004

2 seconds with 3320 opt 005

4 seconds with 3320 opt 006

WAVEFORM GENERATION SOFTWARE

IQCreator version 10 onwards

Windows™ application supporting generic and system specific digital communications standards

See separate brochure

Waveform Formats

As supported in IQCreator.

I Q * 14 bit + 4 markers

AWG TRIGGERING

Trigger Modes

AWG Start only; AWG start & stop*; , AWG Gate, AWG re-trigger*

Trigger Sources

Software, PXI trigger bus[0-7], PXI Star trigger, PXI local bus[6], Trig I/O A, B

*Termination selection; Immediate or End of file

Trigger Functions

Trigger Polarity; +ve, -ve, ANY

AWG file play count 1 to 65,535 or continuous

Trigger delay; 0 to 17 seconds resolution 4 ns

AWG trigger latency ~860 ns + 13 Sample Clocks

GENERAL (3320 & 3050A)

INPUTS AND OUTPUTS

3050A

RF Out SMA (F) 50 ohms

10 MHz I/O SMA (F)

10 MHz I/O SMA (F)

LO in SMA (F) 50 ohms

LO Out SMA (F) 50 ohms

Mod I/O SMA (F)

Trigger 1&2 SSMB (M) x 2

I+, I-, Q+, Q- SSMB (M) x 4

3320

10 MHz reference in SMA

10 MHz reference link through SMA

I+, I-, Q+, Q- SSMB x 4

Trigger IN/OUT SSMB x 2 TTL

Indications

3050A RF On/Off Green LED

FREQUENCY REFERENCE

Internal (3050A)

OCXO

Frequency

10 MHz

Accuracy

Aging rate per day	<0.001 ppm
Aging rate per year	<0.1 ppm
Temperature Stability (0 to 50°C)	<±0.01 ppm typ
Warm-up time	< 5 minutes

Output Level

2.0 V pk-pk square wave

Output Impedance

50 ohms

External Input (module front panel)

Frequency

3050A 10 MHz ± 100 Hz

3320 10 MHz ± 1.5 kHz

Input Impedance

50 ohms or 100 kohms

External Reference Input Level

0.5 V to 4 V pk-pk into 50 ohms

DIMENSIONS

3050A: 3U high PXI hybrid slot compatible module

2 slots wide or 3 slot wide with option 04 fitted

3320: 1-slot wide x 3U high PXI hybrid slot compatible module

WEIGHT

3050A: 0.9 kg, 1.1 kg with option 004

3320: 0.22 kg

POWER

	3050A		3320
Rail	Current (A)	Current (A) opt 04 fitted	Current (A)
+3.3 V	1.7	3.8	3
+5 V	3.5	3.5	2
+12 V	0.4	0.4	0.4
- 12 V	0.4	0.4	0.1

Dissipation

3050A	3320
<33 W	<25 W
<40 W with 3050A option 04	

COMPLIANCE

Electromagnetic Compatibility

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

Safety

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

Driver Software

VXIppn compliant software driver

PXI Standard

PXI Hardware Specification, Revision 2.2, ECN 1 Revision1.0 Hybrid

Slot-Compatible PXI-1 Peripheral Module. PXI Software Specification

RATED RANGE OF USE

Operating Temperature

0 to 50 degrees C, Meets IEC 60068-2-1:2007 and 60068-2-2:2007

Operating Humidity

10% to 90% non-condensing, meets IEC-60068-2-78 -2001

CONDITIONS OF STORAGE AND TRANSPORT (3320 & 3050A)

Storage Temperature

-20 to +70°C, meets IEC-60068-2-1:2007 and 60068-2-2:2007

Storage Humidity

5% to 93% non-condensing, tested to IEC-60068-2-78: 2001

Shock

30 g peak, half sine, 9 ms pulse. Tested in accordance with IEC-60068-2-27:2008

Random vibration 5 Hz to 500 Hz, 2.46 g rms non-operating. Tested in accordance with IEC-60068-2-64:2008

Revision 2.1 VXI plug & play specifications (VPP-2, VPP-3.x, VPP-4.x and VPP-7)

Minimum System Controller Requirements

Recommended minimum memory 2 GByte

Operating System, Windows 2000, XP, 7

Warranty

2 years

Recommended Calibration Interval

2 years. 3320 is calibrated together with it's associated 3050A module.

VERSIONS, OPTIONS AND ACCESSORIES

Ordering

Numbers	Description
3050A	PXI Low Noise RF signal generator
3320	PXI Dual Channel Arbitrary Waveform Generator

Supplied with:

3050A

SMA-SMA link cable 180 mm (43139/739)

Driver software and test results

3320

SMA-SMA link cable 130 mm (43139/738)

SSMB-SSMB link cable 127 mm x 4

Driver software and test results

Accessories

SSMB-SSMB cable 150 mm	23448/907
SMA-SMA link cable 180 mm	43139/739
SMA-SMA link cable 130 mm	43139/738
SMA-SMA link cable 230 mm	43139/783
PXI Slot block (pack of 5)	22361/159
SMA connector saver	46885/224
3 dB SMA attenuator	23448/841
6 dB SMA attenuator	23448/843
50 Ω SMA termination	82532
Torque screw driver (1nM)	22961/500
8 mm crowfoot spanner	22961/501

OPTIONS

3050A

Option 03 ⁽¹⁾	Maximum Frequency extension 6 GHz
Option 04	High output power +20 dBm
Option 05	I & Q Vector Modulation (Requires 3320)

3320

Option 03 ⁽¹⁾	Maximum sample rate extension 250 MHz
Option 04 ⁽¹⁾	Extended AWG sample memory 1 Gbyte
Option 05 ⁽¹⁾	Extended AWG sample memory 2 Gbyte
Option 06	Extended AWG sample memory 4 Gbyte
Option 100 ⁽¹⁾	Enable IQCreator
Option 102 ⁽¹⁾	Enable 2G & 3G cdma

⁽¹⁾ Available as a retrofit with no recalibration

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