

# PXIe-9702

## Arbitrary Waveform Generator Module



📄 Please download the [<JYPEDIA>](#), you can quickly inquire the product prices, the key features and available accessories.

### Overview

PXIe-9702 is an arbitrary waveform generator PXIe modular instrument. The board has two analog output channels, with update rate up to 250MS/s.

### Main Features

- Max 250 MS/s Update Rate
- 2 Analog output channels
- 16 bits DAC
- 3 Output voltage ranges:  
 $\pm 0.5\text{ V}/\pm 1.25\text{ V}/\pm 5\text{ V}$  with a  $50\ \Omega$  load  
 $\pm 1\text{ V}/\pm 2.5\text{ V}/\pm 10\text{ V}$  with a  $100\text{ k}\Omega$  load
- 512 MB DDR3 memory
- One external digital trigger
- One external reference clock
- Digital/Software Trigger
- Windows and Linux Support

## Hardware Specifications

### Analog Output Specifications

Channel Number	2
Output Impedance	50 Ω
DAC Resolution	16 bits
Coupling	DC
Amplitude Range(50 Ω load)	±0.5 V
	±1.25 V
	±5 V
Amplitude Range(100 kΩ load)	±1 V
	±2.5 V
	±10 V
DC gain error	±0.05%
DC offset error	±0.08% of Amplitude Range
Connector type	SMA

### Analog Output Accuracy

JY-9702 Basic Accuracy = ±(% Reading+% Range)											
Nominal Range (V)	24 Hour Tcal ±1°C			90 Days Tcal±5°C			Temperature Coefficients(/°C)			24 Hr Full Scale Accuracy	90 Days Full Scale Accuracy
	1	0.14	+	0.05	0.36	+	0.07	0.007	+	0.005	2 mV
2.5	0.13	+	0.05	0.34	+	0.07	0.007	+	0.007	5 mV	11 mV
10	0.12	+	0.06	0.32	+	0.08	0.013	+	0.006	17 mV	39 mV

Accuracy valid to 95% of full range

### PFI Specifications

Connector type	Mini HDMI
Channel number	8
Destinations	Bidirectional
Frequency range	30 MHz
Voltage	3.3 V LVCMOS
Impedance	50 Ω
Coupling	DC

## PXle-9702 Connector Pin Definition

PXle-9702 Connector Pin Definition		
pin number	Mini-HDMI pin definition	After HDMI adapting
1	GND	PFI0
2	PFI0	GND
3	PFI1	PFI1
4	GND	PFI2
5	PFI2	GND
6	PFI3	PFI3
7	GND	PFI4
8	PFI4	GND
9	PFI5	PFI5
10	GND	PFI6
11	PFI6	GND
12	PFI7	PFI7
13	GND	GND
14	NC	NC
15	NC	NC
16	NC	NC
17	NC	NC
18	3.3V OUT 300mA Limited output impedance <1Ω	3.3V OUT 300mA Limited output impedance <1Ω
19	NC	NC

### Trigger In

Connector type	SMB
Channel number	1
Destinations	Bidirectional
Frequency range	30 MHz
Voltage	3.3 V LVCMOS
Impedance	50 Ω
Coupling	DC

### Frequency and Transient Response

Analog filter	Passband: 100 MHz@ -1.1 dB Stopband: 450 MHz@-80 dB
Passband Flatness	1.1 dB

### DDS Mode Maximum Frequencies

Sine	±1 V(100 MHz), ±2.5 V(80 MHz), ±10 V(50 MHz至60 MHz)
Square	±1 V/ ±2.5 V/±10 V(10MHz)
Triangle	±1 V/ ±2.5 V/±10 V(20MHz)

### Sample Clock

Source	Internal: PLL-based
Sample Rate Range	31.25 MHz ~ 250 MHz

### Onboard Clock (Internal TCXO)

Frequency accuracy	2 ppm
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### Phase-Locked Loop (PLL) Reference Clock

Sources	PX1e_CLK100 CLK IN Internal TCXO
Frequency accuracy	Dependent on the frequency accuracy of the PLL Reference Clock source
Lock time	≤ 1000 ms,
Duty cycle range	40% to 60%

### Clock IN

Connector type	SMB
Destinations	PLL Reference Clock
Frequency range	10MHz
Input voltage range into 50 Ω	Sine wave: 0.5 V pk-pk to 2.4 V pk-pk
	Square wave: 0.5 V pk-pk to 2.4 V pk-pk
Maximum input overload	±3.3 V
Impedance	50 Ω
Coupling	AC

### Special Operation Note

The PX1e-9702 module has identified five non-configurable update rate intervals within its operational range of 31.25 MS/s to 250 MS/s. To avoid configuration errors, users should ensure the update rate is set outside these intervals. JYTEK software drivers include an automatic check function to validate the update rate before applying it to the hardware, generating appropriate error messages if a non-configurable rate is attempted.

Interval	Start Rate (MS/s)	Stop Rate (MS/s)
1	159.616	160.833
2	172.917	175.454
3	192.501	192.999
4	207.501	208.571
5	230.556	241.249

## Performance and Tests

### Average Noise Density

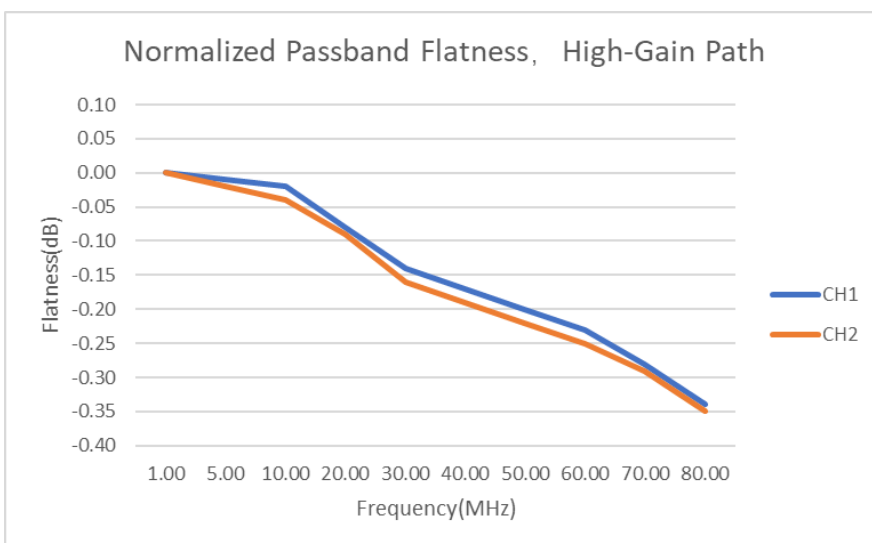
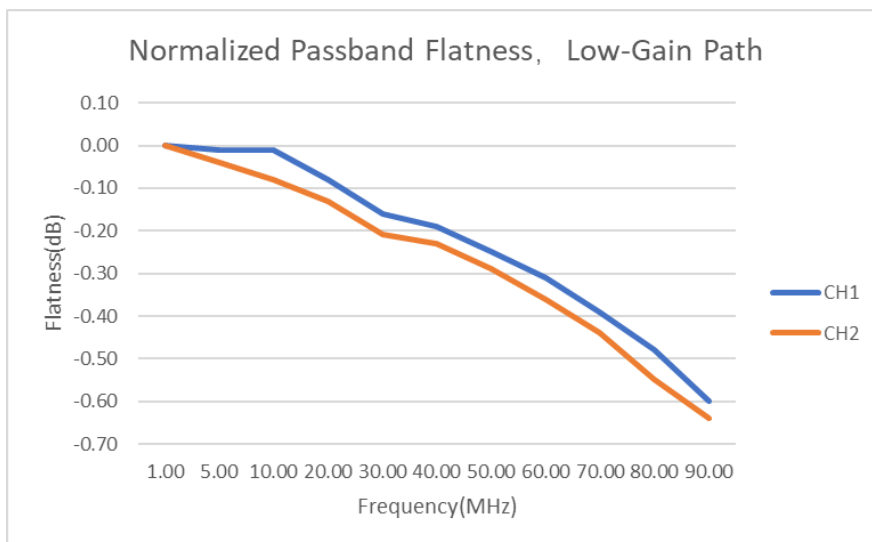
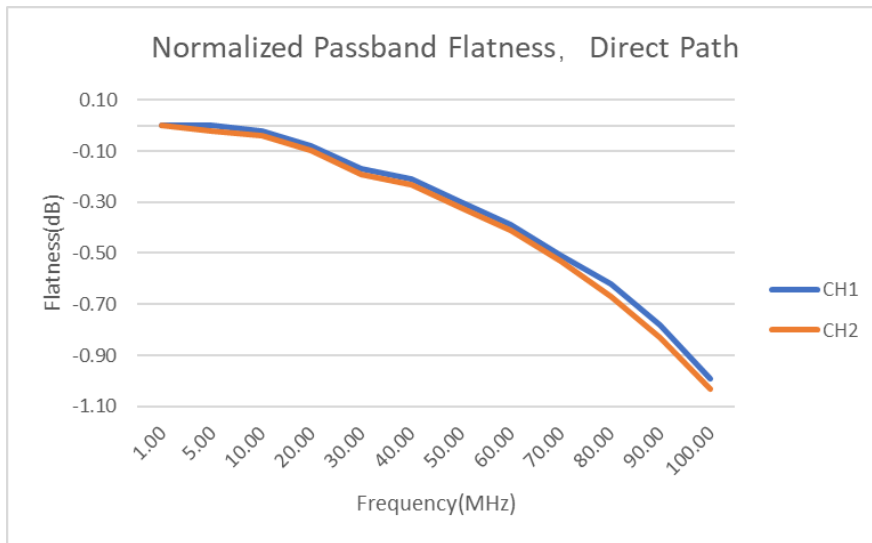
CH0 Noise, Output Signal 45MHz, 40M Filter						
Voltage Range	Normalized Amplitude	No Filter Signal	After Filter Signal	Filter Insertion Loss	dBm/Hz	dBFS/Hz
±0.5 V(50 Ω load )	0.95	3.08	0.68	-2.4	150.02	150.7
±1.25 V(50 Ω load )	0.95	11.45	8.87	-2.58	142.11	150.98
±5 V(50 Ω load )	0.95	23.59	19.93	-3.66	130.46	150.39

CH1 Noise, Output Signal 45MHz, 40M Filter						
Voltage Range	Normalized Amplitude	No Filter Signal	After Filter Signal	Filter Insertion Loss	dBm/Hz	dBFS/Hz
±0.5 V(50 Ω load )	0.95	3.08	0.68	-2.4	150	150.68
±1.25 V(50 Ω load )	0.95	11.45	8.87	-2.58	142	150.87
±5 V(50 Ω load )	0.95	23.59	19.93	-3.66	130	149.93

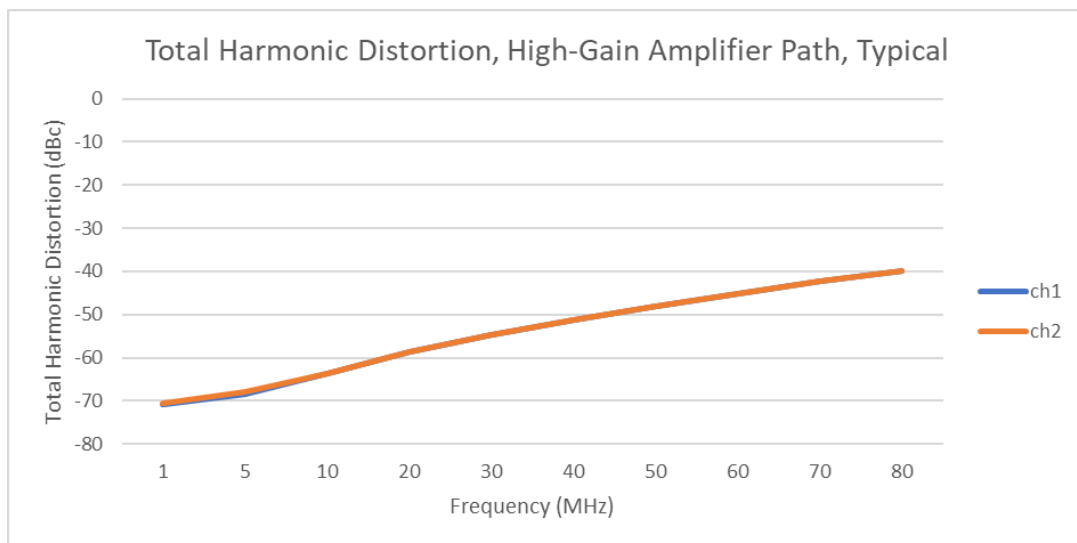
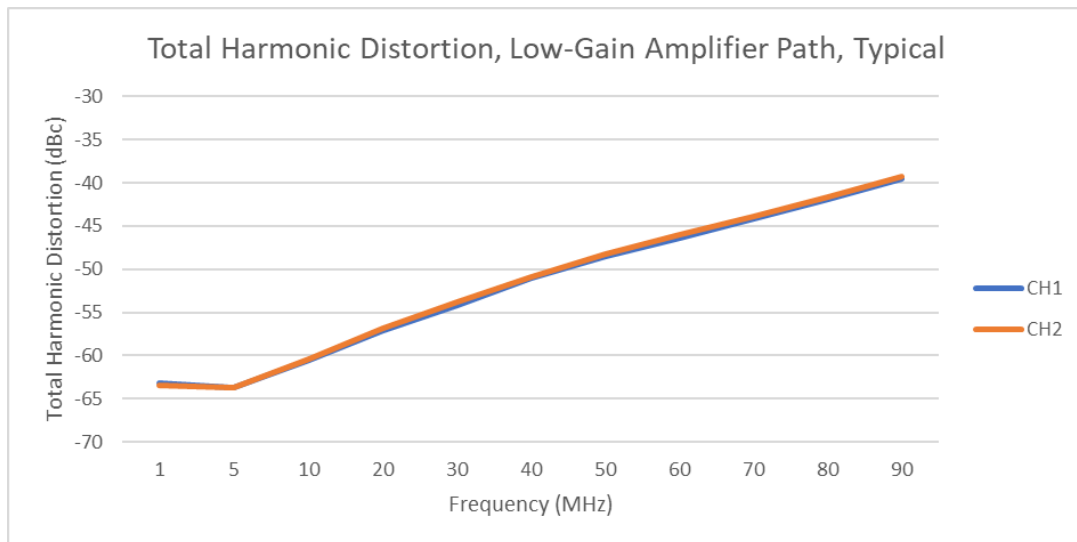
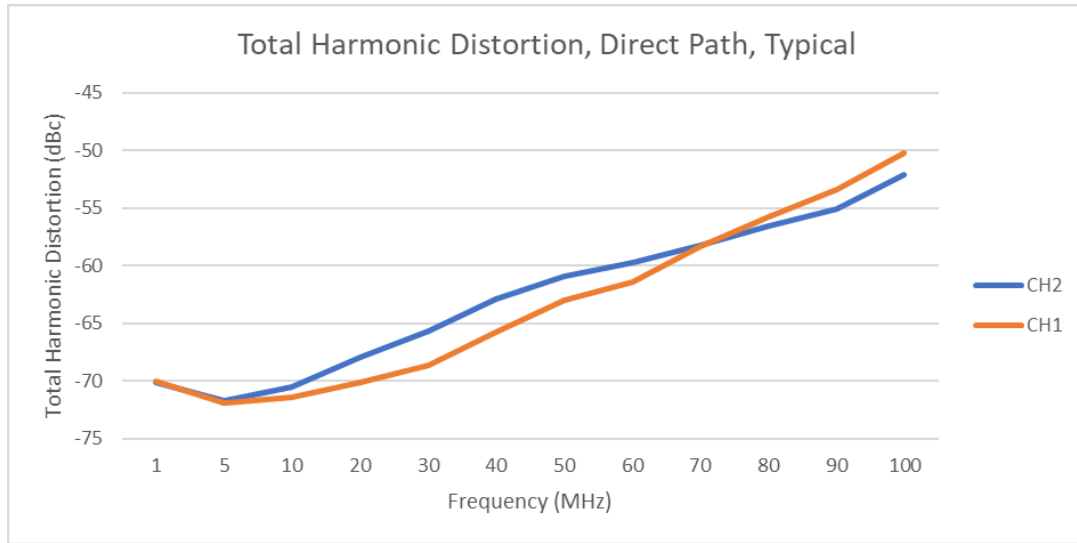
### Spurious-Free Dynamic Range (SFDR)

Frequency	Direct path		Low-Gain Amplifier Path		High-Gain Amplifier Path	
	CH1	CH2	CH1	CH2	CH1	CH2
1.00	71.10	71.26	65.14	65.34	73.06	72.84
5.00	72.38	72.37	64.00	64.05	69.91	69.00
10.00	72.10	71.19	60.94	60.82	65.24	65.07
20.00	70.81	68.63	57.36	57.12	60.43	60.08
30.00	69.44	66.30	54.56	54.17	56.60	56.09
40.00	66.77	63.59	51.80	51.46	53.13	52.66
50.00	65.70	62.33	49.73	49.15	50.10	49.52
60.00	66.16	62.28	47.90	47.29	47.61	46.93
70.00	64.42	62.83	45.87	45.36	45.42	44.71
80.00	56.90	57.61	43.78	43.36	43.35	45.17
90.00	54.46	55.45	41.84	41.42	-	-
100.00	52.07	53.44	-	-	-	-

### Normalized Passband Flatness



### Total Harmonic Distortion



## Order Information

- PXIe-9702 (PN: JA9702000-01)
- 2-CH,  $\pm 5V$  16-bit 250 MS/s High-Speed PXIe Arbitrary Waveform Generator

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