

**WS8101A/WS8102A/WS8104A**

100MHz Single, Dual &amp; Four Channel Arbitrary Function Generators

## Specifications

CONFIGURATION	
Output Channels:	1, 2 or 4, semi-independent

  

STANDARD WAVEFORMS	
Frequency Range:	
Sine:	1μHz to 100MHz
Square:	1μHz to 50MHz
All Others:	1μHz to 25MHz

  

SINE	
Start Phase:	0-360°
Phase Resolution:	0.01°
Harmonics Distortion @1Vp-p (Typ.):	
1MHz to 5MHz:	<-60dBc
5MHz to 10MHz:	<-57dBc
10MHz to 25MHz:	<-55dBc
25MHz to 50MHz:	<-50dBc
50MHz to 100MHz:	<-45dBc
Non-Harmonics Distortion @1Vp-p (Typ.):	
1MHz to 25MHz:	<-70dBc
25MHz to 50MHz:	<-65dBc
50MHz to 100MHz:	<-60dBc
THD:	0.1% (DC to 100kHz)
Flatness (1kHz):	
DC to 1MHz:	1%
1MHz to 10MHz:	3%
10MHz to 25MHz:	5%
25MHz to 80MHz:	10%
Phase Noise (8 points Sine, Max. SCLK, Typ.)	
100Hz Offset:	-80dBc/Hz
1kHz Offset:	-89dBc/Hz
10kHz Offset:	-92dBc/Hz
100kHz Offset:	-112dBc/Hz
1MHz Offset:	-140dBc/Hz

  

TRIANGLE	
Start Phase:	0-360°
Phase Resolution:	0.01°
Timing Ranges:	0%-99.9% of period

  

SQUARE	
Duty Cycle Range:	0% to 99.9%
Resolution:	0.1%
Rise/Fall Time:	<3ns
Overshoot (typ.):	<5%
Jitter (rms):	<100ps

  

RAMP	
Timing Ranges:	0%-99.9% of period

  

SINC (Sine(x)/x)	
"0 Crossings":	4-100

  

GAUSSIAN	
Time Constant:	10-200

  

EXPONENTIAL PULSE	
Type:	Rise or Decay, selectable
Time Constant:	-100 to 100

  

REPETITIVE NOISE	
Type:	Repetitive
Bandwidth:	25MHz

  

DC	
Range:	-6V to 6V

  

Pulse	
Pulse Mode:	Single or double, programmable
Polarity:	Normal, inverted or complement
Period:	20ns to 1000s
Parameters Ratio:	1,000,000 to 1
Resolution:	5ns
Pulse Width:	10ns to 1000s
Accuracy:	<2% (typ.)
Rise/Fall Time:	
Fast:	<4ns
Linear:	5ns to 1000s
High Time, Delay &	
Double Pulse Delay:	5ns to 1000s
Impedance:	50Ω
Amplitude Window:	10mVp-p to 12Vp-p <sup>(1)</sup>
Low Level:	-6V to +5.994V <sup>(1)</sup>
High Level:	-5.994V to +6V <sup>(1)</sup>

<sup>(1)</sup> Double into option impedance

  

ARBITRARY WAVEFORMS	
Sample Rate:	1.5S/s to 200MS/s
Vertical Resolution:	16 bits
Waveform Memory:	1Mpts
Min. Segment Size:	16 points
Resolution:	4 points
No. of Segments:	1 to 1k
Waveform Granularity:	1 point

  

SEQUENCED WAVEFORMS	
Sequencer Steps:	1 to 1k
Segment Duration:	600ns min.
Segment Loops:	1 to 1M
Advanced Modes:	Automatic, Stepped, Single, Mixed
Advance Source:	External, internal or software

  

MODULATION	
Carrier Waveform:	Sine wave
Carrier Frequency:	1μHz to 100MHz
Source:	Internal
AM	
Envelope Waveform:	Sine, square, triangle, ramp
Envelope Freq.:	1mHz to 100kHz
Modulation Depth:	0% to 100%
FM	
Modulating Shape:	Sine, square, triangle, ramp
Modulating Freq.:	1mHz to 100kHz
Peak Deviation:	Up to 100MHz
ASK / FSK / PSK	
Baud Rate:	1bits/sec to 10Mbits/sec
Data Bits Length:	2 to 4,000
SWEEP	
Sweep Step:	Linear or log
Sweep Direction:	Up or Down
Sweep Time:	1μs to 500s
Frequency:	10/100MHz

  

COMMON CHARACTERISTICS	
FREQUENCY	
Resolution:	
Display:	11 digits (limited by 1μHz)
Remote:	14 digits (limited by 1μHz)
Accuracy/Stability:	Same as reference
ACCURACY REFERENCE CLOCK	
Internal:	1ppm/year aging rate
External (10MHz):	TTL, 50% or Sine, 50Ω 0dBm
AMPLITUDE	
Range:	10mV to 12Vp-p into 50Ω <sup>(1)</sup>
Resolution:	4 digits
Accuracy (1kHz):	±(1% + 50mV), typ.
Rise/Fall Time:	<3ns, typ.
Overshoot:	5%, typ.
OFFSET	
Range:	0 to ±5.994V, into 50Ω <sup>(1)</sup>
Resolution:	1mV
Accuracy:	±(1%+1% of Amplitude +5mV)
FILTERS	
Type:	25MHz/50MHz/60MHz/120MHz
RUN MODES	
Type:	Continuous, Triggered, Gated, Burst

**WS8101A/WS8102A/WS8104A**

100MHz Single, Dual &amp; Four Channel Arbitrary Function Generators

## Specifications

OUTPUTS	
<b>MAIN OUTPUTS</b>	
Connectors:	Front panel BNC
Type:	Single-ended
Impedance:	50Ω ±1%
Protection:	Short Circuit to Ground, 10s max
<b>SYNC OUTPUT</b>	
Connector:	Front panel BNC
Source:	Common
Type:	Single ended
Waveform Type:	BIT (4 points wide)
Impedance:	50Ω
Amplitude:	TTL
<b>Variable Position Control:</b>	
Range:	0 to segment length
Resolution:	4 points
<b>DIGITAL PATTERN OUTPUTS (WS8101/2A ONLY)</b>	
Connector:	Rear panel SCSI-2, 68-pin
Pattern Width:	16-bits, differential
Source:	Channel 1 only
Output Level:	LVDS
Pattern Length:	
Dedicated Memory:	1 to 128k
Arbitrary Memory:	16 to 1M
Update Frequency:	100μpps to 200Mpps
INPUTS	
<b>TRIGGER INPUT</b>	
Connector:	Rear panel BNC
Input Impedance:	10kΩ
Polarity:	Positive or negative, selectable
Level:	±5V
Sensitivity:	100mV
Damage Level:	±12V
Min. Pulse Width:	10ns
<b>EXTERNAL REFERENCE INPUT</b>	
Connector:	Rear panel SMB
Input Frequency:	10MHz
Impedance & Level:	10kΩ ±2%, TTL, 50% ±2%
Level:	±5V

TRIGGER CHARACTERISTICS	
Trigger Delay:	[(0; 200ns to 20s) + system delay]
Delay Resolution:	20ns
Delay Error:	6 SCLK + 150ns
<b>EXTERNAL</b>	
Source:	Rear panel BNC, common
Slope:	Positive/Negative, selectable
Damage Level:	±12V
Input Frequency:	DC to 2.5MHz
Trigger Level:	-5V to 5V
Resolution:	1mV
Sensitivity:	100mV
Min. Pulse Width:	10ns
System Delay:	6 SCLK + 150ns
Trigger Jitter:	±1 SCLK period
<b>INTERNAL / TIMER</b>	
Range:	200ns to 20s
Resolution:	20ns
Error:	3 SCLK + 20ns
<b>MANUAL</b>	
Source:	Soft trigger command from the front panel or remote

INTER-CHANNEL DEPENDENCY	
Separate controls:	Output on/off, amplitude, offset, standard waveforms, user waveforms, user waveform , sequence table
Common Controls:	Sample clock (Arb), frequency (Std), period (Pulse) reference source, trigger modes, trigger advance source, SYNCOUT.
<b>LEADING EDGE OFFSET</b>	
Jitter:	0ps
Offset Range:	0 to ±1M points
Reference:	Each CH. in reference to CH 1
<b>Resolution and Accuracy:</b>	
Channels 1/2	1 point
Channels 3/4	4 points
Initial Skew:	<1ns
Error	1 SCLK

GENERAL	
Voltage:	85 to 265VAC, 48-63 Hz
Power Consumption:	60W max.
Display Type:	Color LCD
Size:	3.8"
Resolution:	320 x 240 pixels
<b>Interfaces:</b>	
USB:	1 x Rear, USB device, (A)
LAN:	1 x Rear, 100/10 BASE-T
GPIB:	1 x Rear, IEEE-488.2
<b>Dimensions (WxHxD):</b>	
With Feet:	212 x 102 x 415 mm
Without Feet:	212 x 88 x 415 mm
<b>Weight:</b>	
Without Package:	3.5 Kg
Shipping Weight:	5 Kg
<b>Temperature:</b>	
Operating:	0°C to +40°C
Storage:	-40°C to +70°C
Warm up time:	30 minutes
Humidity:	85% , non-condensing
Safety:	CE Marked, IEC61010-1-1:2008
EMC:	IEC 61326-1:2006
Calibration:	2 years
Warranty:	1 year

ORDERING INFORMATION	
MODEL	DESCRIPTION
WS8101A	100MHz Single Channel Arbitrary Function Generator
WS8102A	100MHz Dual Channel Arbitrary Function Generator
WS8104A	100MHz Four Channel Arbitrary Function Generator
ACCESSORIES	
S-Rack Mount:	19" Single Rack Mount Kit
D-Rack Mount:	19" Dual Rack Mount Kit
Case Kit:	Professional Carrying Bag

Disclaimer. The contents of this document are provided by Tabor Electronics, 'as is'. Tabor makes no representations nor warranties with respect to the accuracy or completeness of the contents of this publication and reserves the right to make changes to the specification at any time without notice.