

 **40 Years**
Celebration



WAVEXCITER SERIES

Excite Your World!

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Leading the Way
In Waveform Generation


TABOR ELECTRONICS Ltd.
Since 1971

Pulse / Pattern Creation

Generating complex pulse trains has never been easier. The Pulse Composer is a powerful tool that converts the WX series unit to a very sophisticated Pulse/Pattern Generator, allowing to create literally any complex pulse train / pattern, whether it's a single pulse, multi-level, linear-points, initialization or preamble pattern definition, arbitrary bit design, user-defined or even standard random patterns with programmable resolution, so it doesn't matter if your application is radar communications, nanotechnology or serial bus testing, the pulse/pattern composer is the right tool for your application.

Smart Trigger

Until now, you've been forced to trigger on a specific event. Tabor's all-new SmartTrigger feature was designed to enhance the trigger capability and facilitate wider flexibility of a specific pulse event. It allows triggering on either a pulse having a larger pulse width than a programmed time value (time), or even on a pulse having a pulse width between two limits ($<>$ time). In addition, the SmartTrigger has a hold-off function, in which the output is held idle after the first trigger and starts a waveform cycle only with the first valid trigger after a hold-off interval has lapsed, allowing you to solve endless "negotiation" scenarios.



Powerful Segmentation and Sequencing

Solving almost every complex application, powerful segmentation and sequencing produces a nearly endless variety of complex waveforms. The waveform memory can be divided into multiple waveform segments and sequenced in user-selectable fashion to create complex waveforms that have repeatable segments, jump and nest, saving you precious memory space. The WaveXciter also allows you to generate up to 1000 sequence scenarios and sequence between them to generate an even higher level of flexibility in waveform creation.

Dynamic Segment / Sequence Control

Working in the real-time world and need fast waveform switching? The WaveXciter series has a rear panel control designed specifically for that. Having the dynamic control feature, in effect, can serve as replacement of the sequence table where the real-time application can decide when and for how long a waveform will be generated. For much more complex applications, this same input may serve as a dynamic switch for complete sequences, creating real-life scenarios for real-time applications.

WaveXciter Series

High-Speed Arbitrary Waveform Generators

Tabor's all-new WaveXciter series offers unrivaled performance, even when compared to instruments designed to generate fewer types of signals or higher sampling rates. The WaveXciter can generate literally any waveform, at frequencies up to 1GHz with 8 digits of resolution and 1 point granularity, resulting in the highest precision signal creation and regeneration. Aside from its natural ability to generate arbitrary waveforms, the WaveXciter can also be used as a full-featured standard, modulation or pulse generator to solve various applications. Its affordable footprint saves space and cost without compromising bandwidth and signal integrity.

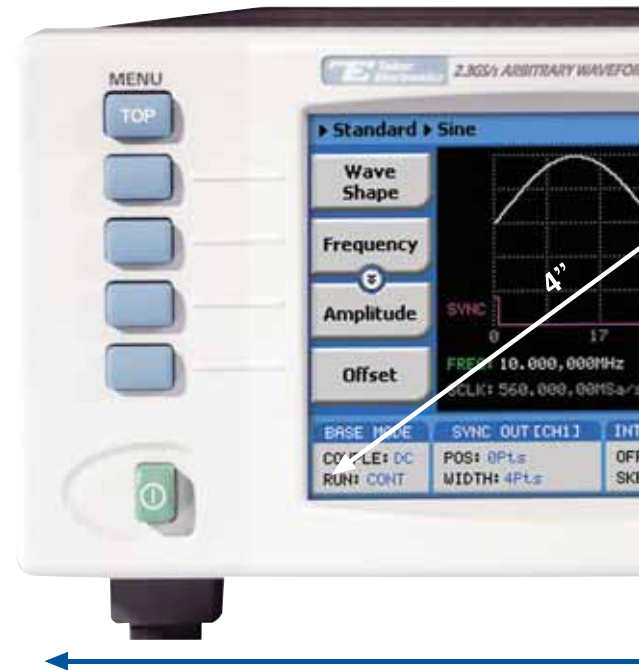
- 1.25GS/s and 2.3GS/s, 14 bit, 16M/32M waveform generators
- Single or dual channel, separate or synchronized with 10ps resolution
- 1GHz sine and 500MHz square waves
- Up to 4Vp-p into 50Ω, DC-Coupled or -20 to +10dBm, AC-Coupled paths
- Extensive modulation capabilities with up to 1GHz CW
- Powerful pulse/pattern composer for analog, digital and mixed signals
- Advanced sequencer allows, stepping, looping, nesting and jumps
- Built-in fast dynamic segments and sequences hop control
- Store and recall on USB stick or 4GB internal flash memory
- Two instrument synchronization to form a 4-channel system

MODEL	1281B 1282B NEW	2181B 2182B NEW
Channels	1 2*	1 2*
Waveform Type	Standard, Arbitrary, Pulse, Pattern, PAM, Modulated and Sequenced	
Max. Sample Clock Rate	1.25GS/s	2.3GS/s (2.5GS/s typ.)
Waveform Memory	16M (32M option)	16M (32M option)
Memory Management	Advanced Sequencing with up to 16K segments; 16K steps; 1M loops	
Vertical Resolution	14 bits	14 bits
Modulation	AM, FM, ASK, Amp. Hop, FSK, Freq. Hop, Sweep, Chirp	
Max Frequency (Sine/Square/others)	500MHz / 350MHz / 125MHz	1GHz / 500MHz / 250MHz
Max Amplitude (into 50Ω)	DC: 2Vp-p / HV: 4Vp-p / AC: -20 to +10dBm (double into open circuit)	
Transition Time	DC: <600ps (<500ps typ.) / HV: <1ns	
Run Modes	Continuous, Self armed, Armed, Triggered, Burst, Normal, Override & Gated	
Markers	2 Programmable differential markers per channel	
Storage	4GB Internal Flash memory and USB host	
Display	4" Color LCD	
Remote Programming	Full IVI-COM & IVI-C drivers (C++, CVI, LabView), MATLAB and ArbConnection	
Connectivity	1000BASE-T LAN, USB 2.0, GPIB and LXI -C compliant	

* Fully independent or synchronized with 10ps resolution control

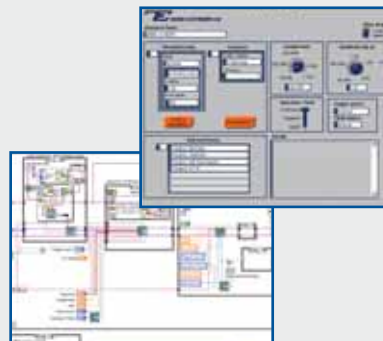
Common or Separate Clocks

The WaveXciter has two output channels, which can either operate independently, or synchronized to share the same sample clock source. As two separate channels, one has the advantage of having two separate instruments in one box, with each having the ability to be programmed to output different function shapes, frequency, amplitude levels and/or to operate in different run modes. Alternatively, the advantage of having two synchronized channels with less than 10ps skew and skew control is very significant in applications that require an accurate and controlled phase between the two channels, which is ideal for many X-Y modes and I&Q output applications.



Multiple Environments to Write Your Code

The WaveXciter Series comes with a complete set of drivers, allowing you to write your application in various environments including Labview, CVI, C++, VB and MATLab. You may also link the supplied dll to other Windows-based API's or use low-level SCPI commands to program the instrument, regardless of whether your application is written for Windows, Linux or Macintosh operating systems.



ArbConnection

ArbConnection is a powerful software package that allows you to easily design any type of waveform and control the instrument functions, modes and features via a graphical user interface (GUI). Whether you need to generate output using a built-in waveform, a hand sketched or played back waveform, a pulse pattern, a serial data string, a modulated carrier or even an equation, ArbConnection provides you the editing tools which makes virtually any application possible.

For more information or to schedule a demo, call today

	WX1281/2B	WX2181/2B
ARBITRARY WAVEFORMS		
Sample Rate:	10MS/s to 1.25GS/s	10MS/s to 2.3GS/s (2.5GS/s typ.)
Vertical Resolution:	14 bits	14 bits
Waveform Memory:	16M points standard, 32M points optional	16M points standard, 32M points optional
Min. Segment Size:	384 points	384 points
Resolution:	32 points (16 point with opt. 1)	32 points (16 point with opt. 1)
No. of Segments:	1 to 16k	1 to 16k
Waveform Granularity:	1 point	1 point
Dynamic control:	Software command or rear panel segment control port	Software command or rear panel segment control port
Jump Timing:	Coherent or asynchronous	Coherent or asynchronous
SEQUENCED WAVEFORMS		
Multi Sequence:	1 to 1,000 unique scenarios	1 to 1,000 unique scenarios
Sequencer Steps:	1 to 16k steps	1 to 16k steps
Min. Segment Duration:	32ns	32ns
Segment Loops:	1 to 1M cycles, each segment	1 to 1M cycles, each segment
Sequence Loops:	1 to 1M ("Once" mode only)	1 to 1M ("Once" mode only)
Step Advance Modes:	Continuous, once (x "N") and stepped	Continuous, once (x "N") and stepped
SEQUENCED SEQUENCES		
Sequence Scenarios:	1 Scenario	1 Scenario
Dynamic Control:	Software command or rear panel sequence control port	Software command or rear panel sequence control port
Table Length:	1 to 1k steps	1 to 1k steps
Advance Control:	Continuous, once and stepped	Continuous, once and stepped
Sequence Loops:	1 to 1,000,000 cycles	1 to 1,000,000 cycles
MODULATION		
COMMON CHARACTERISTICS		
Carrier Waveform:	Sine	Sine
Carrier Frequency:	10kHz to 500MHz	10kHz to 1GHz
Modulation Source:	Internal	Internal
FM		
Modulation Shape:	Sine, square, triangle, ramp	Sine, square, triangle, ramp
Modulation Freq.:	$(CW/6) > (M.F) > (30e^{-6} \times CW)$	$(CW/6) > (M.F) > (30e^{-6} \times CW)$
Deviation Range:	CW/2	CW/2
FSK / FREQUENCY HOPPING		
Hop Table Size:	2 to 10,000 ($< CW \times 10.24e^{-3}$)	2 to 10,000 ($< CW \times 10.24e^{-3}$)
Hop Type:	Fast or Linear	Fast or Linear
Dwell Time Mode:	Fixed or programmable per step	Fixed or programmable per step
Dwell Time:	4ns to 10s	2ns to 10s
Dwell Time Res.:	4ns	2ns
SWEEP / CHIRP		
Sweep Type:	Linear or log	Linear or log
Sweep Direction:	Up or down	Up or down
Sweep Time:	$(9/High\ Freq.) > (S.T) > (50e^3/High\ Freq.)$	$(9/High\ Freq.) > (S.T) > (50e^3/High\ Freq.)$
Modulation Shape:	Pulse	Pulse
Pulse Repetition:		
Range	100ns to 2s	100ns to 2s
Resolution	3 digits	3 digits
Accuracy	100ppm	100ppm
AM		
Modulation Shape:	Sine, square, triangle, ramp	Sine, square, triangle, ramp
Modulation Freq.:	$(CW/9) > (M.F) > (CW/50e^3)$	$(CW/9) > (M.F) > (CW/50e^3)$
Modulation Depth:	0.1 to 100%	0.1 to 100%
ASK / AMPLITUDE HOPPING		
Hop Table Size:	2 to 10,000 ($< CW \times 10.24e^{-3}$)	2 to 10,000 ($< CW \times 10.24e^{-3}$)
Resolution	Maximum amplitude/4096	Maximum amplitude/4096
Hop Type:	Fast or Linear	Fast or Linear
Dwell Time Mode:	Fixed or programmable per step	Fixed or programmable per step
Dwell Time:	4ns to 10s	2ns to 10s
Resolution	4ns	4ns

Specification

	WX1281/2B	WX2181/2B
CONFIGURATION		
Output Channels	1/2, Synchronized/fully separated	1/2, Synchronized/fully separated
STANDARD WAVEFORMS		
Type:	Sine, triangle, square, ramp, pulse, sin(x)/x, exponential rise, exponential decay, gaussian, noise and DC.	
Frequency Range:		
Sine	10kHz to 500MHz	10kHz to 1GHz
Square, Pulse	10kHz to 350MHz	10kHz to 500MHz
All others	10kHz to 125MHz	10kHz to 250MHz
SINE		
Start Phase:	0 to 360°	0 to 360°
Phase Resolution:	0.01°	0.1°
Harmonics Distortion (typ.):	1Vp-p^{DC} 3Vp-p^{HV} 0dBm^{AC}	1Vp-p^{DC} 3Vp-p^{HV} 0dBm^{AC}
5MHz to 200MHz	<-44dBc <-40dBc <-40dBc	<-44dBc <-40dBc <-40dBc
200MHz to 325MHz	<-50dBc ⁽¹⁾ <-50dBc ⁽¹⁾ <-50dBc	<-40dBc ⁽²⁾ <-40dBc ⁽²⁾ <-40dBc
325MHz to 375MHz	<-60dBc ⁽¹⁾ <-60dBc ⁽¹⁾ <-70dBc	<-40dBc ⁽²⁾ <-40dBc ⁽²⁾ <-40dBc
375MHz to 425MHz	<-60dBc ⁽¹⁾ <-60dBc ⁽¹⁾ <-70dBc	<-35dBc ⁽²⁾ <-35dBc ⁽²⁾ <-50dBc
425MHz to 500MHz	<-70dBc ⁽¹⁾ <-70dBc ⁽¹⁾ <-70dBc	<-35dBc ⁽²⁾ <-35dBc ⁽²⁾ <-50dBc
500MHz to 700MHz	-	<-32dBc ⁽²⁾ <-32dBc ⁽²⁾ <-55dBc
700MHz to 1GHz	-	<-70dBc ⁽²⁾ <-70dBc ⁽²⁾ <-70dBc
Non-Harmonics Distortion (typ.):		
1MHz to 100MHz	<-80dBc	<-80dBc
100MHz to 250MHz	<-75dBc	<-75dBc
250MHz to 500MHz	<-70dBc	<-70dBc
500MHz to 1GHz	-	<-65dBc
SSB Phase Noise (10kHz offset):		
1MHz Carrier	<-120dBc/Hz	<-120dBc/Hz
10MHz Carrier	<-118dBc/Hz	<-118dBc/Hz
100MHz Carrier	<-115dBc/Hz	<-115dBc/Hz
250MHz Carrier	<-108dBc/Hz	<-108dBc/Hz
500MHz Carrier	<-100dBc/Hz	<-100dBc/Hz
1GHz Carrier	-	<-95dBc/Hz
Flatness (AC Path, Cross Range):	±0.5dB	±0.5dB
PULSE		
Pulse Mode:	Single or double, programmable	Single or double, programmable
Polarity:	Normal, inverted or complement	Normal, inverted or complement
Period:	4ns to 1.6s	2ns to 1.6s
Resolution:	1ns	500ps
Pulse Width:	2ns to 1.6s	1ns to 1.6s
Rise/Fall Time:		
Fast		
DC Path	700ps (<600ps, typ.)	600ps (<500ps, typ.)
HV Path	1ns (<900ps, typ.)	1ns (<900ps, typ.)
Linear	2ns to 1.6s	1ns to 1.6s
Delay:	2ns to 1.6s	1ns to 1.6s
Double Pulse Delay:	2ns to 1.6s	1ns to 1.6s
Amplitude:		
Range		
DC Path	50mVp-p to 2Vp-p into 50Ω ⁽³⁾	50mVp-p to 2Vp-p into 50Ω ⁽³⁾
HV Path	100mVp-p to 4Vp-p into 50Ω ⁽³⁾	100mVp-p to 4Vp-p into 50Ω ⁽³⁾
Levels		
Low Level	-2V to +1.95V ⁽³⁾	-2V to +1.95V ⁽³⁾
High Level	-1.95V to +2V ⁽³⁾	-1.95V to +2V ⁽³⁾
PULSE / PATTERN COMPOSER		
Type:	Multi-level, linear-points, arbitrary bit design, PAM	Multi-level, linear-points, arbitrary bit design, PAM

⁽¹⁾ Measured with 500MHz lowpass filter

⁽²⁾ Measured with 1GHz lowpass filter

⁽³⁾ Double into high impedance

TRIGGER CHARACTERISTICS	
EXTERNAL	
Source:	Channel 1, channel 2, or both
Connector:	SMA
Input Impedance:	10kΩ
Polarity:	Positive, negative, or both
Damage Level:	±20Vdc
Frequency Range:	0 to 15MHz
Trigger Level Control:	
Range	-5V to 5V
Resolution	12 bit (2.5mV)
Accuracy	±(5% of setting + 2.5mV)
Sensitivity	0.2Vp-p
Pulse Width:	10 ns, minimum
System Delay:	200 SCLK periods + 50ns
Trigger Delay:	Separate for each channel
Range	0 to 8,000,000 SCLK periods
Resolution	8 points (4 point with option 1)
Accuracy	Same as SCLK accuracy
Smart Trigger:	Detects a unique pulse width
Conditioned Trigger:	< pulse width, > pulse width or <>pulse width
Pulse Width Range	50ns to 2s
Resolution	2ns
Accuracy	±(5% of setting + 20ns)
Trigger Hold-off:	Ignores triggers for a hold-off
Hold-off Range	100ns to 2s
Resolution	2ns
Accuracy	±(5% of setting + 20ns)
Trigger jitter:	8 SCLK periods; 4 SCLK periods with option 1
INTERNAL	
Source:	Common or separate
Modes:	
Timer	Waveform start to waveform start
Delayed	Waveform stop to waveform start
Timer:	
Range	400ns to 2s
Resolution	3 digits
Accuracy	100ppm
Delay	
Range	152 to 8,000,000 SCLK periods
Resolution	Even numbers, divisible by 8 (4 with option 1)
MANUAL	
Source:	Soft trigger command from the front panel or remote
INTER-CHANNEL SKEW CONTROL	
COURSE TUNING	
Initial skew:	200ps
Control:	
Range	0 to waveform-length points
Resolution	8 points (4 point with option 1)
Accuracy:	Same as SCLK accuracy
FINE TUNING	
Initial skew:	200ps
Control:	
Range	-3ns to +3ns
Resolution	10ps
Accuracy:	(10% of setting + 20ps)

TWO INSTRUMENTS SYNCHRONIZATION	
Initial Skew:	20ns + 0 to 16 SCLK (8 SCLK with option 1)
Offset Control:	0 to Waveform length
Offset Resolution:	8 SCLK increments (4 SCLK with option 1)
Skew Control:	-5ns to 5ns
Skew Resolution:	10ps
Clock Source:	Master sample clock generator
Trigger Source:	Master trigger input
GENERAL	
Voltage Range:	100VAC to 240VAC
Frequency Range:	50Hz to 60Hz
Power Consumption:	150VA
Display Type:	TFT LCD, back-lit
Size	4 "
Resolution	320 x 240 pixels
Interfaces:	
USB 2.0	
Host	1 x front, USB host, (A type);
Device	1 x rear, USB device, (B type)
LAN	1000/100/10 BASE-T
GPIB	IEEE 488.2 standard interface
Segment control	2 x D-sub, 9 pin
Dimensions:	
With Feet	315 x 102 x 395 mm (WxHxD)
Without Feet	315 x 88 x 395 mm (WxHxD)
Weight:	
Without Package	4.5 kg
Shipping Weight	6 kg
Temperature:	
Operating	0°C to 40°C
Storage	-40°C to 70°C
Humidity:	85% RH, non condensing
Safety:	CE Marked, IEC61010-1
EMC:	IEC 61326-1:2006
Calibration:	2 years
Warranty:	5 years standard

ORDERING INFORMATION

MODEL	DESCRIPTION
WW1281B	1.25GS/s Single Channel Arbitrary Waveform Generator
WW1282B	1.25GS/s Dual Channel Arbitrary Waveform Generator
WW2181B	2.3GS/s Single Channel Arbitrary Waveform Generator
WW2182B	2.3GS/s Dual Channel Arbitrary Waveform Generator

OPTIONS

Option 1*: 32M Memory (per channel)

* Improves timing characteristics as well

ACCESSORIES

Sync Cable: Multi-instrument synchronization

S-Rack Mount: 19" Single Rack Mounting Kit

Case Kit: Professional Carrying Bag

Note: Options and Accessories must be specified at the time of your purchase.

Specification

COMMON CHARACTERISTICS	
FREQUENCY	
Resolution:	8 digits
Accuracy/Stability:	Same as reference
ACCURACY REFERENCE CLOCK	
Internal	1 ppm from 19°C to 29°C; 1ppm/°C below 19°C or above 29°C; 1 ppm/year aging rate
External	-5dBm to 5dBm into 50Ω
OUTPUTS	
MAIN OUTPUTS	
Coupling:	DC-coupled, or AC-coupled
Connectors:	Front panel SMAs
Impedance:	50Ω nominal, each output
Protection:	Protected against temporary short to case ground
DC-COUPLED	
Type:	Single-ended or differential
Resolution:	4 digits
Accuracy:	±(3% +5 mV), offset = 0V
Overshoot:	5%, typical
DC PATH	
Rise/Fall Time:	<700ps (<600ps, typ.)
Amplitude Range:	
Single-ended	50mVp-p to 2Vp-p ⁽³⁾
Differential	100mVp-p to 4Vp-p ⁽³⁾
HV PATH	
Rise/Fall Time:	1ns (< 900ps, typ.)
Amplitude Range:	
Single-ended	50mVp-p to 4Vp-p ⁽³⁾
Differential	100mVp-p to 8Vp-p ⁽³⁾
OFFSET	
Offset Range:	-1.5V to + 1.5V into 50Ω ⁽³⁾
Offset Resolution:	4 digits
Offset Accuracy:	±(5% +5mV)
RF, AC-COUPLED	
Type:	Single-ended
Amplitude Range:	-20dBm to +10dBm into 50Ω,
Resolution:	4 digits
Accuracy:	±(3% +0.5dBm)
Bandwidth:	
WX1281/2B	500MHz
WX2181/2B	1GHz
MARKER OUTPUTS	
Number of Markers:	Two markers per channel
Type:	Differential (+) and (-) outputs
Connectors:	SMB
Skew Between Markers:	100ps, typical
Impedance:	50Ω
Amplitude Voltage:	
Window	0V to 1.25V, single-ended; 0V to 2.5V, differential
Low level	0V to 0.8V, single-ended; 0V to 1.6V, differential
High level	0.5 V to 1.25V, single-ended; 0V to 2.5V, differential
Resolution:	10mV
Accuracy:	10% of setting
Width control:	4 SCLK to segment length; 2 SCLK with option 1
Position control:	
Range	0 to segment length
Resolution	4 points (2 point with option 1)
Initial delay:	4ns±½ clock (Output to marker)

⁽¹⁾ Measured with 500MHz lowpass filter

⁽²⁾ Measured with 1GHz lowpass filter

⁽³⁾ Double into high impedance

Variable delay:	
Control	Separate for each channel
Range	0 to 3ns
Resolution	10ps
Accuracy	±(10% of setting +20ps)
Rise/Fall Time:	<1ns, typical
SYNC OUTPUT	
Connector:	Front panel SMA
Source:	Channel 1 or channel 2
Type:	Single ended
Waveform Type:	
Pulse	32 points width (16 points with option 1)
WCOM	Waveform complete
Impedance:	50Ω
Amplitude:	1V; doubles into high impedance
Variable Position Control:	
Range	0 to segment length
Resolution	32 points (16 point with option 1)
Rise/Fall Time	2ns, typical
Variable Width control:	
Range	32 points (16 points with option 1) to segment length
Resolution	32 points (16 point with option 1)
INPUTS	
TRIGGER / EVENT INPUT	
Connector:	
Trigger	Front panel SMA
Event	Rear panel BNC
Input Impedance:	10kΩ
Polarity:	Positive, negative, or both
Damage Level:	±20Vdc
Frequency Range:	0 to 15MHz
Trigger Level Control:	
Range	-5V to 5V
Resolution	12 bit (2.5mV)
Accuracy	±(5% of setting + 2.5mV)
Sensitivity	0.2Vp-p
Min. Pulse Width:	10ns
SEQUENCE/SEGMENT CONTROL INPUT	
Connectors:	Rear panel D-sub, 8 bit lines
Input Impedance:	10kΩ
Input Level:	TTL
EXTERNAL REFERENCE INPUT	
Connector:	Rear panel BNC
Input Frequency:	10MHz to 100MHz
Input Impedance:	50Ω
Voltage Swing:	-5dBm to 5dBm
Damage Level:	10dBm
EXTERNAL SAMPLE CLOCK INPUT	
Connector:	Rear panel SMA
Input Impedance:	50Ω
Voltage Swing:	0dBm to 10dBm
Input Frequency:	
WX1281/2B	1GHz to 2.5GHz (Double the internal clock)
WX2181/2B	1GHz to 5GHz (Double the internal clock)
Clock Divider:	1/1, 1/2, 1/4, 1/256, separate for each channel
Damage Level:	15dBm
RUN MODES	
Type:	Continuous, Self armed, Armed, Triggered, Normal, Override, Gated



Setting the Standard in High-Speed Arbitrary Waveform Generators!

For more details read inside.



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