Agilent 81101A
50 MHz One-Channel Pulse Generator
Data Sheet

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Key Features
- Agilent 8110A user interface.
- Variable transitions.
- Up to10 Vpp (20 Vpp) into 50 Ω.
- 3.5 digits timing resolution, best case 5 ps.
- 0.01% frequency accuracy.
- Fully SCPI programmable.
- Broad range of trigger and synchronization capabilities.
- Dropout and glitch free change of any timing parameters.
- 8.9 cm height, full rack width.
- Graphical display.

Agilent 81100 Family of Pulse/Pattern Generators
The Agilent Technologies 81101A pulse generator belongs to the 81100 family. All members have the same programming and user interfaces that are compatible with the well-established Agilent 8110A. Migration is therefore easy and cost effective.

Signals for testing digital designs and components
The 81101A generates all of the standard pulses needed to test current logic technologies (CMOS, TTL, ECL, etc.);

- Variable pulse parameters.
- Can be triggered in syncrony.

Glitch-free timing changes
Now you can sweep your timing values without the danger of spurious pulses or dropouts that could cause measurement errors (applies to continuous mode, values < 100 ms, consecutive values between 0.5 and twice the previous value).

Reliable measurements
The 81101A provides clean, accurate pulses with excellent repeatability, thus contributing to measurement integrity.

Easy to use
Features such as the clear graphical display, autoset, help, store/recall, preset TTL/ECL levels, selectable units (such as current/voltage, width/duty-cycle), and load compensation ensure a high level of convenience.

Smooth integration into automated test systems
The 81101A can be integrated easily into all phases of test system development, such as planning, rack integration, and test program generation. Test programs are 100% upwardly compatible to the 81104A and 81110A, ensuring that growth with future needs is just as easy as exchanging the instruments themselves. This results in low integration costs, in addition to low costs of ownership, through proven hardware reliability.

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Specifications

Specifications describe the instrument's warranted performance. Non-warranted values are described as typical. All specifications apply after a 30-minute warm-up phase with 50 Ω source/load resistance and separate channels. All specifications are valid from 0°C to 55°C ambient temperature.

Timing Characteristics

Measured at 50% amplitude at fastest transitions, in continuous mode, and 50 Ω source impedance.

Mainframe	Agilent 81101A
Frequency range	1 mHz to 50 MHz
Timing resolution	3.5 digits, 5 ps best case
RMS jitter (period, width, delay) With PLL With VCO[1]	± 0.001% ± 15 ps ± 0.01% ± 15 ps
Period range Accuracy with PLL	20 ns to 999.5 s ± 0.01% (± 5%)[1]
Width range Accuracy	10.0 ns to (period - 10.0 ns) ± 5% ± 250 ps[2]
Additional variable delay range Accuracy[3]	0 ns to (period - 20 ns) ± 5% ± 1 ns
Double pulse delay range Accuracy	(width + 10.0 ns) to (period - width - 10.0 ns) ± 5% ± 500 ps
Transition time range (10/90) Accuracy Linearity	5 ns to 200 ms variable ± 10 % ± 200 ps 3% typ. for transitions > 100 ns

[1] If the startable oscillator (VCO) is used (PLL not active).
[2] Changing of amplitude may add 0.5 ns.
[3] Width accuracy specification is valid up to 5.5 Vpp amplitude. Above this amplitude, the width will typically increase up to 300ps.

Burst Count: 2 to 65536 (single or double pulses).
Delay: Delay, phase, or % of period.
Double pulse delay: Double pulse and delay are mutually exclusive.
Duty cycle: Set between 0.1% and 95% (subject to width limits; 99.9% with overprogramming).

Transition times: These can be entered as leading/trailing edge or % of width. Leading and trailing edges are independent within one of the following overlapping segments (1:20 ratio): 5 ns - 20 ns, 10 ns - 200 ns, 100 ns - 2 μs, 1μs - 20 μs, 10 μs - 200 μs, 100 μs - 2 ms, 1 ms - 20 ms, 10 ms - 200 ms.

Output timing fidelity: Period, delay, and width are continuously variable without any output glitches or dropouts.
Repeatability: Is typically four times better than accuracy.

Level/Pulse Performance Characteristics

Level specifications are valid after a 30 ns typical settling time.

		Agilent 81101A
Amplitude	50 Ω into 50 Ω	100 mVpp to 10.0 Vpp
	1 kΩ into 50 Ω	200 mVpp to 20.0 Vpp
Level window	50 Ω into 50 Ω	-10.0 V to +10.0 V
	1 kΩ into 50 Ω	-20.0 V to +20.0 V
Accuracy	50 Ω into 50 Ω	± (3% + 75 mV)
	1 kΩ into 50 Ω	± (3% + 150 mV) [1]
Resolution	50 Ω into 50 Ω	10 mV
	1 kΩ into 50 Ω	20 mV
Output connectors		BNC single-ended
Source Impedance		Selectable 50 Ω or 1 kΩ
Accuracy		Typ. ± 1%
Max. external voltage		± 24 V
Short circuit current		±400 mA max.
Base line noise		10 mV RMS typ.
Overshoot/preshoot/ringing		± 5% of amplitude ± 20 mV

[1] In ±19 V level window.

Level parameters:
Can be entered as voltage or current, as high and low level, or as offset and amplitude.
Load compensation:
The actual load value can be entered (for loads ≠ 50 Ω) to display actual output values.
On/off:
Relays connect/disconnect output (HiZ).
Normal/complement:
Selectable
Limit:
Programmable high and low levels can be limited to protect the device-under-test.

Trigger Modes
Continuous:
Continuous pulses, double pulses, or bursts (single or double pulses).
External triggered:
Each active input transition (rising, falling or both) generates a single or double pulse or burst.
External gated:
The active input level (high or low) enables pulses, double pulses, or bursts. The last single/double pulse or burst is always completed.
External width:
The pulse shape can be recovered, while period and width of an external input signal are maintained. Levels and transitions can be set.
Manual:
Simulates an external input signal.
Internal triggered:
Internal PLL replaces an external trigger source.

Inputs and Outputs
Clock input/PLL reference and external input: One input (BNC connector at rear panel) is used for clock input or alternatively for the PLL.
PLL Reference: The internal PLL is locked to an external 5 MHz or 10 MHz reference frequency.
Clock input: The output period is determined by the signal at CLK input
Ext. input: Used for trigger, gate, or external width.
Input impedance: 50 Ω/10 kΩ selectable
Threshold: -10 V to +10 V
Max. input voltage: ±15 Vpp
Sensitivity: ≤300 mVpp typical
Input transitions: <100 ns
Frequency: Dc to 50 MHz
Minimum pulsewidth: 10 ns

Strobe output and trigger output

Strobe: Marks the beginning of each burst

Trigger format: One pulse per period with 50% duty cycle typical

External mode: 9 ns typical

Level: TTL or ECL selectable

Output impedance: 50 Ω typical

Max. external voltage: -2 V/+7 V

Transition times: 1.0 ns typical for TTL, 600 ps typical for ECL

User Interface

Overprogramming: Values can be entered, exceeding the specified range, to fully exploit the hardware limits.

Setting check: Warning messages indicate potentially conflicting parameters due to inaccuracy. Error messages indicate conflicting parameters.

Help key: Displays a context sensitive message.

Autoset key: Resolves all timing conflicts.

Non-volatile memory: The current setting is saved on power-down. Up to nine user settings and one fixed default setting are stored in the instrument.

Memory card: 99 settings can be stored on a 1 MB PCMCIA card (MS-DOS).

Remote Control: Operates according to IEEE standard 488.2, 1987 and SCPI 1992.0

Function Code: SH1,AH1,T6,L4,SR1, RL1,PP0,DC1,DT1,C0

Programming times: All checks and display off

ASCII command	Typical exec. time
One parameter or mode	30 ms typical
Recall setting	250 ms typical

Typical delay times Agilent 81101A

Instrument mode	From	To	Typical value
External width	EXT. INPUT	STROBE/TRIGGER OUT OUTPUT 1/OUTPUT 2	8.5 ns 22.5 ns
All other modes	EXT. INPUT/CLK INPUT	STROBE/TRIGGER OUT OUTPUT 1/OUTPUT 2	12.0 ns 29 ns
	STROBE/TRIGGER OUT	OUTPUT 1/OUTPUT 2	17 ns

General

Operating temperature: 0°C to +55°C
Storage temperature: -40°C to +70°C
Humidity: 95% r.h. up to 40°C ambient
temperature
EMC: Conforms to EN50082-1, EN
55011, Class B
Noise emission: 5.7 bel typical
Battery: Lithium CR2477-N
Safety: IEC1010, CSA1010
Power requirements:
100-240 Volts ac, ± 10%, 50-60 Hz
100-120 Volts ac, ± 10%, 400 Hz
Power consumption: 300 VA max.
Max. dimensions (H x W x D):
89 mm x 426 mm x 521 mm
Weight: 9.2 kg net, 13.8 kg shipping
Recalibration period: One year
recommended
Warranty: Three years standard

Ordering Information

Each Agilent 81101A includes just one output channel
(in comparison to the other models of the 81100A family).

The English Quick Start Guide (81101-91010) and Reference Guide
(81101-91011) are supplied with each instrument for all configurations.
A memory card is not included.

81101A 50 MHz one-channel Pulse Generator, 10V

Accessories
Opt UN2 Rear Panel Connectors (instead of front panel)
Opt 1CP Rack Mount and Handle Kit (5063-9219)
Opt 1CN Handle Kit (5063-9226)
Opt 1CM Rack Mount Kit (5063-9212)
Opt 1CR Rack Slide Kit (1494-0059)
Opt UFJ 1 MB SRAM Memory Card (0950-3380)
15104A Pulse Adder/Splitter

Quick Start Guide language options
Opt ABF French Guide (81101-91210)
Opt ABJ Japanese Guide (81101-91510)
Opt AB0 Taiwan Chinese Guide (81101-91610)
Opt AB1 Korean Guide (81101-91710)
Opt AB2 Chinese Guide (81101-91810)

Additional documentation options
Opt 0BW Service Manual (81101-91021)
81101-91031 Service Documentation (Component Level)

Support Options
Opt 1BP MIL Std. 45662A Calibration with Test Data
Opt UK6 Commercial cal. certificate
Opt W32 3 Year Customer Return Calibration Coverage
Opt W34 3 Year MIL Calibration Service
Opt W50 5 Year Customer Return Repair Coverage
Opt W52 5 Year Customer Return Calibration Coverage
Opt W54 5 Year Customer Return Calibration Coverage

Related Literature

	Pub. Number
Agilent Family of Pulse/Pattern Generators, brochure	5980-0489E
Agilent 81100 Family of Pulse/Pattern Generators, data sheet	5980-1215E
Agilent 8110A Pulse/Pattern Generator, data sheet	5980-1212E
Agilent 8114A 100V/2A Programmable Pulse Generator, data sheet	5980-1213E
Agilent 8133A 3 GHz Pulse Generator, data sheet	5980-1214E
Radar Distance Test to Airbourne Planes, product note	5968-5843E
The Dual Clock Gbit Chip Test, product note	5968-5844E
Magneto-Optical Disk Drive Research, product note	5968-5845E
Simulation of Jittering Synchronization Signals for Video Interfaces, product note	5968-5846E
Electronic Functional Test of the Consolidated Automated Support System (CASS), case study	5968-5998E

For more information, please visit us at:
www.agilent.com/find/pulse_generator

Agilent Technologies' Test and Measurement Support, Services, and Assistance
Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise
"Our Promise" means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage
"Your Advantage" means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

Get assistance with all your test and measurement needs at:
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