# GP1552A SERIES

## DUAL CHANNEL, 50 MHZ PROGRAMMABLE PULSE GENERATOR - HP 8160A, WAVETEK 859 COMPATIBLE

- 100% Form-Fit-Function compatibility with Hewlett Packard 8160A (GP1552AH) and Wavetek 859 (GP1552AW)
- IEEE-488.2 and SCPI compatible
- NSN 6625-01-494-1049 (GP1552WR)


## DESCRIPTION

The GP1552A Series are stand-alone pulse generators that can be used as direct replacements for the obsolete HP 8160A (GP1552AH) and Wavetek 859 (GP1552AW) instruments. When used as a replacement for one of these obsolete products, existing test software does not need to be modified as the GP1552A operates and responds exactly as the product it replaces.The GP1552A supports both single and dual channel configurations for the HP8160A and Wavetek 859 pulse generators.

## FEATURES

Pulse design and programming are simple and straightforward using the GP1552A Series' menu-driven front-panel interface. Character mnemonics on the clear, graphic LCD display describe each function or parameter selected, with programmed values and units of measure displayed. Error detection and LED indicators contribute to fast, problem-free operation.

Up to 99 (49 for the W version) front-panel settings can be stored and recalled for convenient local operation. This feature simplifies test sequence development and can eliminate the need for a controller in repetitive tests, greatly reducing bus traffic in automated test applications. The last user setup is also retained at power down.

The GP1552A Series features pulse widths from 10 ns to 10 sec and delays from 0 ns to 10 sec with up to 6 digits of resolution. Output levels are adjustable from –20 V to +20 V, with pulse amplitudes from 0.5 V to 10 $V_{PP}$ into a 50 Ω load. The pulse generators also feature selectable complementary pulse and double pulse generation in continuous, triggered, gated, and counted burst modes. The GP1552A series allows selection of predefined amplitude levels for TTL, CMOS or ECL signals, or a custom amplitude level for a specialized application. Input/Output connections include signal and sync output, as well as triggering, gating and external width input.

For operation flexibility, variable transitions (rise and fall times) can be programmed from 5 ns to 25 ms, within six ranges. Various pulse shapes can be obtained for applications where parameters such as linearity, switching times, or reflection times must be analyzed. Operational amplifier slew rates can be measured, or thresholds of devices and circuits can be tested using programmable rise and fall times.

With the GP1552A Series pulse generators, superior timing and amplitude accuracies are achieved through internal calibration, which is performed automatically whenever the parameter settings are changed. Internal calibration can also be selected from the front panel menu or via a GPIB command.

## APPLICATIONS

- Automatic Test Equipment (ATE)
- Avionics testing
- Radar testing

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## SPECIFICATIONS

| PULSE FUNCTIONS | |
|---|---|
| **Single** | One pulse at each selected period up to 50 MHz repetition rate. |
| **Double** | One pair of pulses at each period up to 25 MHz repetition rate. Both pulses have the same selected width; the position of the second pulse is set by the delay control. |
| **OPERATING MODES** | |
| **Continuous** | Output continuous at programmed period rate |
| **Triggered** | Output quiescent until triggered by an internal, external, GPIB, or manual trigger, then generate one cycle at the programmed periodic rate. |
| **Gated** | Same as triggered mode except pulses are active for the duration of the gated signal; once the gate deactivates, the last waveform's period continues to completion |
| **Burst** | Same as triggered mode. Output is active for a programmed number of cycles from 2 to 999,999. Set by the N BURST function |
| **External Width** | Trigger duration and rate sets pulse width and repetition |
| **TIMING CHARACTERISTICS** | |
| Period (Common to Both Channels) | |
| **Range (Single Pulse)** | 20 ns to 10 s<br>(50 MHz - 0.1 Hz repetition rate) |
| **Range (Double Pulse)** | 40 ns to 10 s, paired pulse per period mode<br>(25 MHz - 0.1 Hz repetition rate) |
| **Resolution** | Up to 6 digits, limited to 0.1 ns |
| **Accuracy** | ±1% of setting, ±1 ns, measured at 50% point of rising edge of sync pulse |
| **Jitter** | ≤0.1% of setting + 50 ps, decreasing to 0.01% on slowest range |
| Width (Independent for Each Channel) | |
| **Range (Single Pulse)** | 10 ns to 9.99999 s limited by 8 ns off time |
| **Resolution** | Up to 6 digits limited to 0.1 ns |
| **Accuracy** | ±2% of setting, ±2ns measured at 50% point of leading and trailing edges, set to fastest transition time (±2 V) |
| **Jitter** | ≤(0.1% of setting + 50 ps) decreasing to 0.005% on slowest range |
| **External Width** | Determined by the external trigger level and the slope setting |
| Delay (Independent for Each Channel) | |
| **Range** | 0 ns to 9.99999 s, limited by 8 ns off time |
| **Resolution** | Up to 6 digits limited to 0.1 ns |
| **Accuracy** | ±2% of setting, ± 2 ns measured at 50% point of leading edge of sync to 50% point of leading edge of output, set to fastest transition time (±2 V) |
| **Jitter** | ≤(0.1% of setting + 50 ps) decreasing to 0.005% on slowest range |
| Duty Cycle (Independent for Each Channel) | |
| **Range** | 1 to 99% (duty dycle may be programmed with DUTY function key or through GPIB in single pulse per period mode) |
| **Resolution** | 3 digits (0.1%) |
| **Accuracy** | Limited by pulse and width accuracy |
| **OUTPUT CHARACTERISTICS** | |
| Amplitude (Independent for Each Channel) | |
| **High Level Range** | -19.90 V to +20 V<br>1 kΩ source impedance,<br>above 10 V and below -10 V |
| **Low Level Range** | -10 V to +9.90 V into 50 Ω load |
| **Amplitude Range** | 0.1 V to 10 $V_{PP}$ into 50 Ω load<br>(20 $V_{PP}$ (max) into open circuit) |
| **Resolution** | 3 digits limited to 10 mV |
| **Accuracy** | ±1% of level setting<br>±2% of pk-pk amplitude<br>± 50 mV into 50 Ω load |
| **Aberrations** | ≤5% + 50 mV into 50 Ω load for pulse levels between ±5 V |
| **Output Impedance** | 50 Ω ± 2%, 1 kΩ (high level range) |
| **Mode** | Normal / Complement |
| **TRANSITION TIMES (INDEPENDENT FOR EACH CHANNEL)** | |
| **Range** | ≤6 ns to 25 ms variable, measured at +5 V to ±2 V and -5 V to -2 V. Leading and trailing edges settable separately and limited to a 20:1 ratio between settings within the following ranges:<br>6 ns - 100 ns, 50 ns - 1 μs<br>500 ns - 10 μs, 5 μs - 100 μs<br>50 ns - 1.0 μs, 500 μs - 10 ms, 10.1 ms - 25 ms |
| **Resolution** | 3 digits limited to 0.1 ns |
| **Accuracy** | ±5% of setting ± 2 ns |
| **Linearity** | <5% deviation from a straight line between 10% and 90% points |
| **INTERNAL TRIGGER** | |
| **Repitition Range** | 100 ns to 100 s |
| **Resoultion** | 4 digits limited to 100 ns |
| **Accuracy** | 0.01% ± 1 ns |
| **Jitter** | ≤(0.1% of setting + 50 ps) |

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| INPUTS AND OUTPUTS | |
|---|---|
| Trigger Input Sensitivity | 150 $mV_{PP}$ (min); DC to 50 MHz |
| Minimum Width | 10 ns; 250 mV required for triggering |
| Maximum Rate | 50 MHz |
| Input Impedance | 1 MΩ ± 5%; 30 pF (GP155xW) |
| Input Protection | ±15 V DC plus peak AC |
| Range | Selectable from 9.99 V |
| Resolution | 3 digits limited to 10 mV |
| Accuracy | ±5% of setting ± 25 mV |
| Slope Selection | Positive or Negative; for triggering and for gating, respectively |
| Counted Burst | 2 - 999,999 cycles per burst |
| SYNC Output | A TTL level pulse at the programmed period rate of the generator's ouput. 50 Ω output impedance, protected against short circuit and up to ±15 V accidental input. The high level is ≥2 V into 50 Ω. 3.5 ns typical transition. |
| **GENERAL** | |
| Power Requirements | 90 V - 256 V; 48 - 66, 70 VA (max) |
| Memory | Non-volatile. Stores up to 99 complete panel settings. Last user setup is retained at power down. |
| Weight | 9 lbs |
| Dimensions (Without Rack Mount Kit) | 3.5" H x 8.4" W x 18" L<br>(8.9 cm x 21.3 cm x 45.7 cm) |
| Operating Temperature | 0 °C to +50 °C |
| Humidity | 95% RH, 0 °C to +30 °C,<br>75% RH to +40 °C,<br>45% RH to +50 °C |
| CE Labeled | Yes |
| **GPIB INTERFACE** | |
| Internal | IEEE-488.2 |
| Address | 0 - 30 front panel selected |

*Specifications and features apply to the GP1552A Series after a 20-minute warmup period, providing that an Internal Calibration has been performed at the current operating temperature ±5 °C

Note: Specifications are subject to change without notice

## ORDERING INFORMATION

| | |
|---|---|
| GP1552AH | 2 Channel Pulse Generator, Compatible with the Hewlett Packard 8160A |
| GP1552AW | 2 Channel Pulse Generator, Compatible with the Wavetek 859 |
| GP1552AWR | 50MHz, Dual Channel Pulse Generator (GPIB) with Rack Mount Kit. Compatible with Wavetek 859. (NSN: 6625-01-494-1049) |
| GP1552AHR | 50MHz, Dual Channel Pulse Generator (GPIB) with Rack Mount Kit. Compatible with HP8160A |
| **ACCESSORY** | |
| GT90002 | GPIB Cable, Double-shielded, 1 meter |
| GT90003 | GPIB Cable, Double-shielded, 2 meters |

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