

Full control of all pulse parameters is provided by external programming lines. Interface to integrated circuits and adaptation to current logic levels is enhanced by the addition of variable baseline offset and polarity inversion functions, which allow simulation of positive, negative or inverted logic. Baseline offset is inserted after the attenuator to permit full use of the offset capability.

Synchronous and asynchronous gating are provided as useful features for systems applications.

Normal/inverted and single/double pulse modes are provided in the Model 1504. In the inverted mode an extremely high duty cycle, including D.C., can be achieved for the output pulse.

1-3 SPECIFICATIONS (all specifications assume a 50-ohm resistive load on the output. (See also subsection 1-4, Accuracy).

Pulse Repetition Frequency	From 0.5 Hz to 50 MHz in 8 decade ranges.
Pulse Delay	From 10 ns to 1 s in 8 decade ranges.
Pulse Width	From 10 ns to 1 s in 8 decade ranges.
Jitter	Less than 0.1% of setting applies to frequency, delay, or width jitter.
Duty Factor	Greater than 50% applies to either delay or width circuit.
Modes	Normal/Inverted and Single/Double Pulse. The inverted mode allows an extremely high duty cycle for the output pulse.
External Drive	Input drive signal must go from less than 0.75V to greater than 1.5V into a 300-ohm load. Maximum input 5V. Maximum frequency 50 MHz.
Synchronous Gate	Input drive signal must go from less than 0.75V to greater than 1.5V into a 375-ohm load. Both gate on an gate off modes are under program control.

Asynchronous Gate	Input drive signal must go from greater than 2.5V to less than 0.75V into a 50-ohm load. Gate off operation only.
Trigger Output	Greater than +1.5V into 50 ohms; greater than +3V into high impedance. Width 10 to 100 ns depending on frequency. Two additional clock outputs available for master/slave pulse generator operation. Output levels same as trigger output. Clock outputs are nominally 25-30 ns early with respect to trigger output.
Minimum Double Pulse Spacing	Less than 12% of width range maximum.
Amplitude	+39 mV to +10V into 50 ohms from a 50-ohm source. Attenuator accuracy is +2%. +10V to +20V into 50 ohms from a 250-ohm source.
Offset	Up to 10V output range: +5V, +25 mV. The maximum output is limited to +10V for the sum of pulse and offset amplitude. In the Off position, offset is less than +5 mV. 20V range: Up to 5V with offset polarity opposite to the pulse polarity only.
Pulse Distortion	Less than 5% peak-to-peak for all amplitudes and for all rise and fall times greater than 3 ns.
Rise and Fall Time	Up to 10V output: 3 ns to 0.8 ms in 6 ranges with separate rise and fall verniers. 20V output: Minimum rise and fall time is 5 ns. For programmed values greater than 10 ns, rise and fall times are the same as the 10V range.
Ramp Linearity	Less than +1.5% above 100 ns. Less than +5% 10 to 100 ns.

1-4 ACCURACY (Including all programming options)

Repeatability	+1% of setting.
Programming Error	+5% of desired value for amplitude and frequency; +5% +3 ns for rise and fall times, delay and width, except +15% of value for 10 ms-100 ms and 100 ms-1 s ranges. Delay and width relate to fastest ramps. +5%, +20 mV for Offset.
Setting Time	Less than 2.5 ms for attenuation and polarity; less than 750 μ s when going to or from ramp ranges 0 and 1.

1-5 PROGRAMMING FORMAT (Option 01-PON only)

Digital Control Lines	Four range and mode control lines and 12 vernier control lines for each function.
Logic Levels	Logic "1" less than 0.75V; logic "0" greater than +2.5V, 5V maximum. Each program line is equal to one 7400 TTL load. Positive true logic (Option 01-POP) supplied on request.
Programming Format	Four bits define mode and range and 12 bits define vernier information in a 3-digit BCD format. Programming formats for other options are discussed in the appendices for each option. These apply to the 1504 as well as the 1501A.

1-5 MISCELLANEOUS

Dimensions	5 1/4 in. (13.3 cm) high, 19 in. (48.2 cm) wide, 20 3/4 in. (52.7 cm) deep.
Weight	35 lb. (15.9 kg).

Power Requirements

100, 117, or 230 VAC $\pm 10\%$,
50-60 Hz, approximately
200 VA.

Operating Temperature Range

0°C to +55°C.

Temperature Coefficient of
Pulse Parameters

Frequency..... $\pm 0.3\%$ /degree C.
Width & Delay..... $\pm 0.1\%$ /degree C.
Amplitude..... $\pm 0.05\%$ /degree C.
Offset..... $\pm 0.05\%$ /degree C.
 ± 0.5 mV/degree C.