

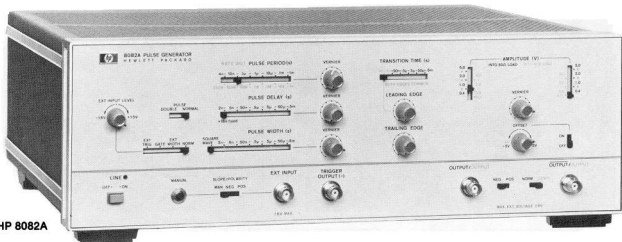
# PULSE GENERATORS

## 250 MHz Fast Pulse Source

Model 8082A

- <1 ns variable transition times
- Ultra-clean 50 ohm source

- Switch-selectable ECL levels
- Dual  $\pm 5$  V outputs



HP 8082A

The HP 8082A is Hewlett-Packard's fastest pulse generator with all pulse parameters variable. With repetition rates to 250 MHz, transition times down to 1 ns and amplitudes to 5 V, the HP 8082A is ideally suited for state-of-the-art TTL and ECL logic designs. Using the HP 8082A, you can rapidly test logic circuits under all operating conditions by simply varying pulse parameters. Although a highly sophisticated instrument, the HP 8082A is still easy to operate because of its logical front panel layout and switch-selectable ECL output levels. Another feature that contributes to ease of operation is the square wave mode. You can, for example, carry out toggle rate tests in this mode up to 250 MHz without having to worry about pulse duty cycle.

Hybrid IC's, manufactured by Hewlett-Packard, are used extensively in the design of the HP 8082A. These IC's eliminate the need for fans, reduce power consumption and enable a low reactance 50 ohm source impedance to be used. This source impedance absorbs 98% of reflections from signals up to 4 V amplitude.

### Specifications

#### Pulse Characteristics (50 $\Omega$ source and load impedance)

**Transition times:** (10% to 90%): 1 ns to 0.5 ms in 6 ranges at amplitudes  $>1.8$  V and  $>4.5$  V respectively in the two upper output ranges. Minimum value may increase to 1.2 ns at other amplitudes. Leading/trailing times are common on fastest range, and independently variable over 1:10 ratio on other ranges.

**Overshoot and ringing:**  $\leq \pm 10\%$  of pulse amplitude may increase to  $\pm 10\%$  with amplitude vernier CCW.

**Preshoot:**  $\leq \pm 5\%$  of pulse amplitude.

**Linearity:** linearly aberration for both slopes  $\leq 5\%$  for transition times  $>5$  ns.

**Output:** maximum amplitude is 5 V from 50  $\Omega$  into 50  $\Omega$ . Maximum output voltage is  $\pm 5$  V (amplitude + offset).

**Offset:**  $\pm 2$  V, into 50  $\Omega$ .

**DC-source impedance:** 50  $\Omega$   $\pm 10\%$ .

**Reflection coefficient:** 5% in ECL setting, increasing to 15% in 5 V range.

**Output protection:** cannot be damaged by open or short circuits or application of ext.  $\leq \pm 6$  V or  $\pm 200$  mA independent of control settings.

**Attenuator:** two separate three-step attenuators reduce the outputs to 1 V. Vernier is common for both outputs and reduces the output to 0.4 V minimum. A further position provides ECL-compatible outputs ( $-0.9$  V to  $-1.7$  V typ. open circuit).

#### Timing

**Repetition rate:** 250 MHz to 1 kHz in 6 ranges.

**Period jitter:**  $<0.1\%$  of setting +50 ps.

**Delay:** 2 ns  $-0.5$  ms in 6 ranges plus typ. 17 ns fxd. with respect to trigger output. Duty cycle  $>50\%$ .

**Delay jitter:**  $<0.1\%$  of setting +50 ps.

**Double pulse:** up to 125 MHz max. (simulates 250 MHz).

**Pulse width:** 2.4 ns to 0.5 ms in 6 ranges.

**Width jitter:**  $<0.1\%$  of setting +50 ps.

**Width duty cycle:**  $>50\%$ .

**Square wave:** delay and double pulse are disabled, max. Rep. Rate 250 MHz. Duty cycle is 50%  $\pm 10\%$  up to 100 MHz, 50%  $\pm 15\%$  for  $>100$  MHz.

**Trigger output:** negative going Square Wave (50% duty cycle typ.)  $>500$  mV from 50  $\Omega$  into 50  $\Omega$ . Internal 50  $\Omega$  can be switched off by slide-switch on PC-board. Amplitude up to 1 V into 50  $\Omega$  up to 200 MHz.

**Trigger output protection:** cannot be damaged by short circuit or application of external  $\pm 200$  mA.

### External Operating Modes

#### External Input

**Input impedance:** 50  $\Omega$   $\pm 10\%$ , dc coupled.

**Maximum input:**  $\pm 6$  V.

**Trigger level:** adjustable  $-1.5$  V to  $+1.5$  V.

**Slope control:** positive, negative or manual selectable. In the manual position all ext. functions can be controlled by push button. Button pushed in simulates an "on-signal."

**Sensitivity:** sine-wave  $>200$  mV p-p pulses  $>200$  mV.

**Repetition rate:** 0 to 250 MHz.

#### External-Controlled Modes

**External trigger:** there is approximately 7 ns delay between the external input and the trigger output. Rep. rate is externally controlled (is triggered by external signal). Trigger output provides the pulse-shaped input signal.

**Synchronous gating:** gating signal turns rep. rate generator on. Last pulse normal width even if gate ends during pulse.

**External width:** output pulse width determined by width of driver input. Rep. rate and delay are disabled. Trigger output provides shaped input signal.

#### General

**Operating temperature:**  $0^\circ\text{C}$  to  $55^\circ\text{C}$ .

**Power:** 100/120/220/240 Vrms; +5%, -10%; 48-440 Hz. 85 VA max.

**Weight:** net, 7.9 kg (17.44 lb). Shipping 8.9 kg (19.63 lb).

**Size:** 133 mm H x 426 W x 345 mm D (5.2" x 16.75" x 13.6").

### Ordering Information

HP 8082A Pulse Generator

**Opt 907:** Front Handle Kit (part number HP 5061-0089).

**Opt 908:** Rack Flange Kit (part number HP 5061-0077).

**Opt 909:** Opt 907, 908 Combined (part number HP 5061-0083).

**Opt 910:** Additional Operating and Service Manual  
Fast-Ship product—see page 766