

# SIGNAL GENERATORS

## Portable Cavity-Tuned Sources, Pulse Modulator

HP 8683/8684B,D, 11720A

- Portable signal generators with high performance modulation
- Internal pulse modulation source
- Wide FM deviation for satellite video  $\pm 10$  MHz peak
- dc coupled FM with rates to 10 MHz



HP 8684D

### HP 8683/8684 Microwave Signal Generators

The HP 8683 and 8684 are rugged portable signal generators designed for demanding benchtop and field maintenance environments.

With high performance AM, FM and pulse modulation, including a built in pulse generator, the HP 8683/84 provides the capability to test modern communications, radar and EW systems.

#### Frequency

##### Range

HP 8683B: 2.3–6.5 GHz.

HP 8683D: 2.3–13.0 GHz.

HP 8684B: 5.4–12.5 GHz.

HP 8684D: 5.4–18.0 GHz.

**Resolution:** HP 8683, 5 MHz using a 4 digit LED display; HP 8684, 10 MHz using a 3 1/2 digit LED display.

#### Stability (typical)

vs. time (20 min. after turn-on): <30 kHz/min.

vs. time (60 min. after turn-on): <100 kHz/hr.

vs. temperature (0°C to 55°C): HP 8683, <15 MHz;

HP 8684, <30 MHz.

vs. line voltage (transients of +5%/-10%): <20 ppm.

#### Spectral Purity

**Harmonics (<18GHz, at specified max output):** <-25 dBc.

HP 8683/84D harmonics are unspecified in x2 frequency band.

**Spurious (non-harmonically related):** <-80 dBc; typ. <-90 dBc.

**Single-sideband phase noise (avg. rms, 1 Hz BW, 10 kHz offset from carrier, typical):** HP 8683B, <-72 dBc; HP 8683D, <-66 dBc; HP 8684B, <-65 dBc; HP 8684D, <-59 dBc.

#### Output

**Range (levelled into 50Ω):** HP 8683/84B, +10 to -130 dBm; HP 8683/84D, +10 to -130 dBm (main band), -3 to -130 dBm (x2 band), +10 dBm in x2 bands available with Option 001.

**Resolution:** 0.1 dB using a 3 1/2 digit LED display.

**Accuracy:**  $\pm 2.5$  dB from maximum specified output power to -110 dBm (to -100 dBm in x2 bands);  $\pm 3.5$  dB to -120 dBm and 0 to +10 dBm for Opt 001. Typ.  $\pm 0.9$  dB at -100 dBm. Option 002 affects level accuracy  $\pm 0.5$  dB.

**Flatness (power level >-10 dBm):**  $\pm 1.0$  dB. (Not for Opt. 001)

#### Amplitude Modulation

**Depth (1 kHz rate):** 0-70%.

**Rates (3 dB BW at 40% depth):** dc to 10 kHz (dc coupled); 50 Hz to 10 kHz (ac coupled).

**Internal AM:** fixed 1 kHz nom. square wave with 50  $\pm 5\%$  duty cycle.

#### Frequency Modulation

**Peak deviation:** HP 8683/84 B,  $\pm 5$  MHz; HP 8683/84D,  $\pm 5$  MHz (main);  $\pm 10$  MHz (x2 band).

**Rates (3 dB BW):** dc to 10 MHz, 100 Hz to 10 MHz (ac coupled).

**Internal FM:** FM sawtooth with a fixed sweep rate of 1 kHz nom. and variable deviation up to  $\pm 5$  MHz ( $\pm 10$  MHz for D models, x2 bands).

#### Pulse Modulation

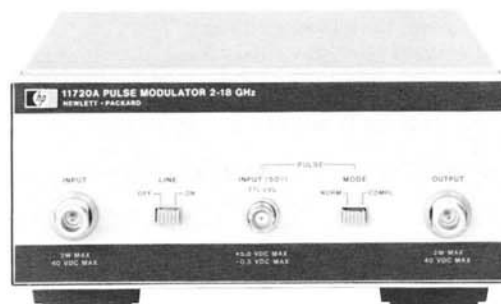
**HP 8683/84 B/D internal pulse generator**

**Rate:** 10 Hz to 1 MHz continuously adjustable in 5 ranges.

**Width:** 50 ns to 100 ms continuously adjustable in 7 ranges.

**Delay (time between sync out and video out):** <50 ns to 100 ms in 7 ranges with continuous adjustment within ranges.

- 2 to 18 GHz Pulse Modulator
- <10 ns rise and fall times
- >80 dB ON/OFF ratio



HP 11720A

### HP 8683/84 B/D external pulse input requirements

**Rate:** 0 to 1 MHz.

**Width:** >100 ns.

**Level:** on >+1.0 V peak; off <+0.4 V peak.

### HP 8683/84 B/D RF pulse specifications

**Rise/fall time:** <10 ns.

**On/off ratio:** >80 dB.

**Minimum pulse width:** <100 ns.

**Maximum pulse repetition frequency:** >1 MHz.

**Peak pulse power:**  $\pm 0.5$  dB of level set in CW mode.

#### General

**Operating temperature range:** 0°C to 55°C.

**EMI:** MIL-STD-461, VDE0871, CISPR Pub. 11.

**Power:** 100, 120, 220 or 240V, +5%, -10%; 48 to 66 Hz; <200 VA max.

**Size:** 145 H x 457 W x 472 mm D (5.7" x 18" x 18.6").

**Weight:** HP 8683: net, 17.9kg (39 lb); shipping, 23.4 kg (51 lb).

HP 8684: net, 16.5 kg (36 lb); shipping, 22.0 kg (48 lb).

### HP 11720A Pulse Modulator

The HP 11720A Pulse Modulator is a high-performance microwave pulse modulator covering the range of 2 to 18 GHz.

In addition to wide frequency coverage, the HP 11720A features extremely short rise and fall times (<10 ns) and a high on/off ratio (>80 dB), making it suitable for almost any pulsed RF application.

**Frequency range:** 2 to 18 GHz.

**ON/OFF ratio:** >80 dB.

**Rise and fall times:** <10 ns.

**Insertion loss:** <6 dB, 2 to 12.4 GHz; <10 dB, 2 to 18 GHz.

**Maximum RF input power:** +20 dBm.

**Maximum repetition rate:** >5 MHz.

**Minimum RF pulse width:** <50 ns.

**Video feedthrough:** <60 mV peak-to-peak.

**Operating temperature:** 0°C to 55°C

**Power:** 100, 120, 220, 240 V, +5%, -10%; 48-400 Hz; 25VA max

**Weight:** net, 2.6 kg (5 lb 12 oz); shipping, 3.6 kg (8 lb.).

**Size:** 101 H x 212 W x 290 mm D (4.0" x 8.4" x 11.4")

#### Ordering Information

HP 8683/84B Microwave Signal Generator

Opt W30: Extended repair service. See page 723.

HP 8683/84D Microwave Signal Generator

Opt 001 +10 dBm in x2 band, HP 8683D

Opt 001 +10 dBm in x2 band, HP 8684D

Opt W30 Extended repair service. See page 723.

Opt 002 Reverse power protection

(except D models)

Opt 910 Extra operating and

service manual

Opt 913 Rack mounting flange kit

HP 11720A Pulse Modulator

Opt W30 Extended repair service. See page 723

#### Price

\$21,000

+ \$410

\$25,000

+ \$3,000

+ \$5,000

+ \$530

+ \$725

+ \$50

+ \$35

\$4,200

+ \$95