

## Low Frequency Adapter Specifications

### Supported VNA Mode: S21.

#### LFA Frequency Range: 20 Hz to 5 MHz.

In the VNA application, an IF bandwidth of 10 Hz must be used to extend the lowest frequency down to 20 Hz.

**Clock Input:** 10 MHz, 0 to +12 dBm, 50 ohms. Clock must be synchronized to the VNA reference clock.

**Input to LFA from VNA Port 1:** 10.000 020 MHz to 15.000 MHz, 0 dBm nominal, Max +6 dBm, 50 ohms (at rear).

**Output from LFA to VNA Port 2:** 10.000 020 MHz to 15.000 MHz, 0 dBm nominal, Max +6 dBm, 50 ohms (at rear).

**Low Frequency Output:** 20 Hz to 5 MHz, 50 ohms, AC coupled, -6 dBm (112 mV RMS into 50 ohms) or 225 mV nominal into an open circuit.

Return Loss: > 40 dB below 5 MHz.

Harmonics at 1 MHz Out / 0 dBm: -65, -70, -50, -70 dBc for the 2nd, 3rd, 4th, 5th harmonics.

Spurs Measured Under No Input From VNA Port 1: -85, -97, -101, -102, -104 dBm at 10, 30, 50, 70, 90 MHz.

Source Linearity (Up to +9 dBm Out): < 0.05 dB

**Low Frequency Input:** 20 Hz to 5 MHz, 1 Mohms in parallel with 8 pF, AC coupled, 0 dBm nominal input level (front panel).

Overload Level: ~ +5 dBm, as indicated by a red LED on the front panel.

Damage Level: 20 V RMS.

Loopback of Low Frequency Output to Low Frequency Input: Yields ~ 0 dBm output to VNA port 2 at  $\times 1$  Gain.

Frequency Response Uncorrected: -3 dB at 35 Hz and 5 MHz,  $\pm 1.5$  dB from 100 Hz to 4 MHz.

A front panel switch provides  $\times 10$  gain to compensate for  $\times 10$  scope probe attenuation.

Back-to-back linearity, including HP 8753D VNA: Up to +3 dBm in: <  $\pm 0.05$  dB.

Two rear adjustments potentiometers allow for tweaking the LO carrier balance to improve dynamic range below 1000 Hz.

Dynamic range: better than 90 dB from 100 Hz to 5 MHz, when used with a VNA having more than 100 dB of dynamic range. Improves by 20 dB at  $\times 10$  gain.

**Sweep time:** For a 170 point log sweep, from 20 Hz to 5 MHz: 50 seconds on the HP 8753D, using 10 Hz IF Bandwidth and LIST frequency mode.

**Monitor Output:** 50 ohms, AC coupled, open circuit level equals input level  $\pm 1$  dB.

Frequency response -3 dB into 50 ohms: 200 Hz to > 80 MHz at  $\times 1$  and > 60 MHz at  $\times 10$  gain.

Maximum Output Level: + 6 dBm into 50 ohms

**Power input:** +11 V to +16 V DC at < 80 mA (at rear). A balanced Pi filter at the input cleans up the DC source from any switching power supply noise.

**Size:** 10.5 cm (W)  $\times$  15 cm (L)  $\times$  3.5 cm (H).