



SPECTRUM GENERATOR/DOUBLER

Versatile broadband operation

Models 10511A, 10515A

HP 10511A Spectrum Generator

The Hewlett-Packard 10511A Spectrum Generator is a passive device that generates a train of 1 nanosecond wide pulses when driven by a sinusoidal signal source. The 10511A was specifically designed as an accessory to the HP 5100A Frequency Synthesizer. However, it is useful with any 50Ω source that can provide the proper input signal.

With a sine wave input, in the frequency range of 10 MHz to 75 MHz, a spectrum of harmonics is generated. This spectrum contains all harmonics of the input frequency to the 1 GHz region. To extract a desired harmonic, a 50Ω bandpass filter can be cascaded with the 10511A to give a sinusoidal output. The HP 230A Power Amplifier (tuned) may be used for higher level outputs for harmonics up to 500 Hz.

Operation of the 10511A with the 5100A without a bandpass filter on the output produces a pulse train whose repetition rate is precisely controlled. The 10511A, with a tuned filter, produces precise CW frequencies between 50 MHz and 500 MHz.

Specifications 10511A

Input requirements

Frequency range: 25 to 50 MHz.*

Drive level: 1 to 3 volts RMS available to 50Ω.

Output

Pulse width: 1 nanosecond, $\pm 15\%$ at mid-amplitude.

Pulse height: 0.75 volt minimum for minimum drive level.

Impedance: 50Ω (nominal).

Available harmonic power: -19 dBm minimum for any harmonic number between 1 and 10.

General

Dimensions: 3 in. long, 1 $\frac{5}{8}$ in. dia. (76 x 41 mm).

Weight: net, 3 oz (85 grams). Shipping, 1 lb (0.45 kg).

Price: model 10511A, \$150.00.

*Useful operation is obtained for input frequencies from 10 MHz to 75 MHz.



HP 10515A Frequency Doubler

The Hewlett-Packard Model 10515A Frequency Doubler is an ideal accessory for use in extending the usable frequency range of signal generators, frequency synthesizers or other signal sources. Operating on input frequencies of 0.5 MHz to 500 MHz it provides a doubled output in the range of 1 MHz to 1 GHz. This 50 ohm device uses a full-wave rectifier circuit which is extremely flat over its entire frequency range. The frequency response is very flat ($< \pm 1$ dB over entire range typically), and undesired harmonics are very well suppressed.

The output of this unit does not have an internal dc return so that it will provide a very broadband ac to dc conversion only if not dc terminated. This mode of operation is useful for detection of low level amplitude modulations.

The 10515A may be used with the following Hewlett-Packard instruments (this is only a partial listing):

| | |
|-----------------------------|-----------------------|
| 5100A Frequency Synthesizer | 606A Signal Generator |
| 5102A Frequency Synthesizer | 3200B VHF Oscillator |
| 5103A Frequency Synthesizer | 608 Signal Generators |
| 5105A Frequency Synthesizer | |

Specifications 10515A

Frequency range: 0.5-500 MHz input; 1-1000 MHz output.

Impedance: 50Ω nominal (source and load).

Input signal voltage: 0.5 - 3.0 V_{RMS}.

Input signal power: 180 mW (maximum).

Conversion loss:*

<12 dB (typically <11 dB) for >1 volt

<13 dB (typically <12 dB) for >0.5 volt

Suppression of 1st and 3rd harmonic of input:*

>30 dB for 0.5 to 50 MHz input (typically >35 dB).

>10 dB for input to 500 MHz (typically >15 dB).

Connectors: input: BNC male; output: BNC female.

Dimensions: diameter: 0.7" (18 mm); length: 2.5" (64 mm).

Weight: net, approximately 2 oz (56 grams); shipping, 1 lb (0.45 kg).

Price: model 10515A, \$120.00.

*With a 50 ohm resistive load and a single input frequency. Suppression values are referred to the desired output level.

