

- 50 kHz to 26.5 GHz with expand carrier frequencies to 110 GHz
- Quick and easy integration into your ATE system

- Ability to test a wide range of devices
- Measure AM noise directly



E5503A



E5503B

### E5500 Series Phase Noise Measurement Solutions

The new Agilent E5500 A-series phase noise measurement solutions have been designed to minimize production ATE test times for one-port VCOs, DROs, crystal oscillators, and synthesizers and to maximize the capability for R&D benchtop applications. In addition, with a standard offset range capability from 0.01 Hz to 100 MHz, the E5500 B-series provides the capability, flexibility, and versatility to meet changing and demanding needs placed upon the R&D engineer. By building upon 30 years of Agilent low phase noise, RF design and measurement experience, the E5500 series solutions continue to provide excellent measurement integrity, repeatability, and accuracy.

The E5500 phase noise measurement solutions use the power of a flexible software program to automate phase noise carrier measurements. The E5500 A-series solutions include the 70420A phase noise test set, which contains phase detectors and phase-lock loop circuitry, a high speed VXI digitizer with mainframe and high speed VXI-to-PC interface for base-band signal analysis, selected low-noise frequency downconverters, and measurement software. When combined with a PC running Windows NT 4.0, this series provides fast phase noise measurements of carrier frequencies from 50 kHz to 1.6 GHz, 6.0 GHz, 18 GHz, or 26.5 GHz over offset-from-carrier frequencies of 0.01 Hz to 4 MHz.<sup>1</sup> The E5500 B-series includes the 70420A phase noise test set, a Pentium PC running Windows NT 4.0, a PC digitizer, and an RF spectrum analyzer, selected low-noise frequency downconverters, and measurement software. This series of solutions provides phase noise measurements of carrier frequencies from 50 kHz to 1.6 GHz, 6.0 GHz, 18 GHz, or 26.5 GHz over offset-from-carrier frequencies from 0.01 Hz to 100 MHz. A variety of signal generators—such as the 8662A, 8663A, 8643A, 8644B, 8664A/B, 8665A—can also be added to provide a low-noise reference signal.

### Phase Noise Measurement Software

A graphical user interface provides measurement menus allowing the operator to specify the measurement process, including the calibration of the system. Several output formats are available to the user, including plots of the single-sideband phase noise power of the signal, integrated noise power, or the calculated Allan variance. A real-time measurement mode is available to monitor the level of phase noise and discrete spurs as changes are made to the device-under-test. The E5500 series phase noise measurement software requires a Pentium PC with 32 MBytes of RAM, a 1 GByte hard drive, and Windows NT 4.0.

<sup>1</sup> It can be extended to cover offset ranges up to 100 MHz.

### Specifications

#### E5500 A-Series

- E5501A:** 50 kHz to 1.6 GHz
- E5503A:** 50 kHz to 18.0 GHz
- E5504A:** 50 kHz to 26.5 GHz

#### E5500 B-Series

- E5501B:** 50 kHz to 1.6 GHz
- E5502B:** 50 kHz to 6.0 GHz
- E5503B:** 50 kHz to 18.0 GHz
- E5504B:** 50 kHz to 26.5 GHz

### Operating Characteristics

#### Offset Frequency Range

- A Models: 0.01 Hz to 4 MHz
- B Models: 0.01 Hz to 100 MHz

**System Noise Response<sup>2</sup>:** -180 dBc/Hz typically (>10 kHz offsets)

**System Spurious Response<sup>2</sup>:** -120 dBc typically

**Phase Detector Input Power:** (<1.6 GHz carrier frequency)

- R input = 0 to +23 dBm
- L input = +15 to +23 dBm

**Downconverter Input Range:** 1 GHz to 6 GHz;

1 GHz to 18 GHz; 1.5 GHz to 26.5 GHz

**External Noise Input Port:** 0.1 Hz to 100 MHz

**Measurement Accuracy:** ±2 dB (<1.0 MHz offsets); ±4 dB (<100 MHz offsets)

#### E5500 A-Series Optional Capabilities

- Extend offset range to 8, 10, and 100 MHz
- Add RF reference source
- Add high power input capability (includes  $\mu$ W phase and AM detectors)
- Extend carrier frequency to 110 GHz

#### E5500 B-Series Optional Capabilities

- Add RF reference source
- Add high power input capability (includes  $\mu$ W phase and AM detectors)
- Add remote SCPI programming client
- Extend carrier frequency to 110 GHz

<sup>2</sup> Without reference sources or downconverters

### Key Literature

- E5500 Series Phase Noise Measurement Solutions, Product Overview, p/n 5965-7590E
- E5500 Series Phase Noise Measurement Solutions Configuration Guide, p/n 5965-7589E

### Ordering Information

**E5500A Series**

**E5500B Series**

See configuration guide for detailed ordering information.