

Wideband Spectral Analysis in CopperPro™ Loop Qualification Tester – The Basics

The application note introduces the basic concepts behind the CopperPro™ Loop Qualification Tester's powerful wideband spectrum analysis tools. There are two important things to know about simple signals:

- 1) A simple signal has a frequency (expressed in Hz, kHz, or MHz)
- 2) A simple signal has a power level (measured in dBm or dBm)

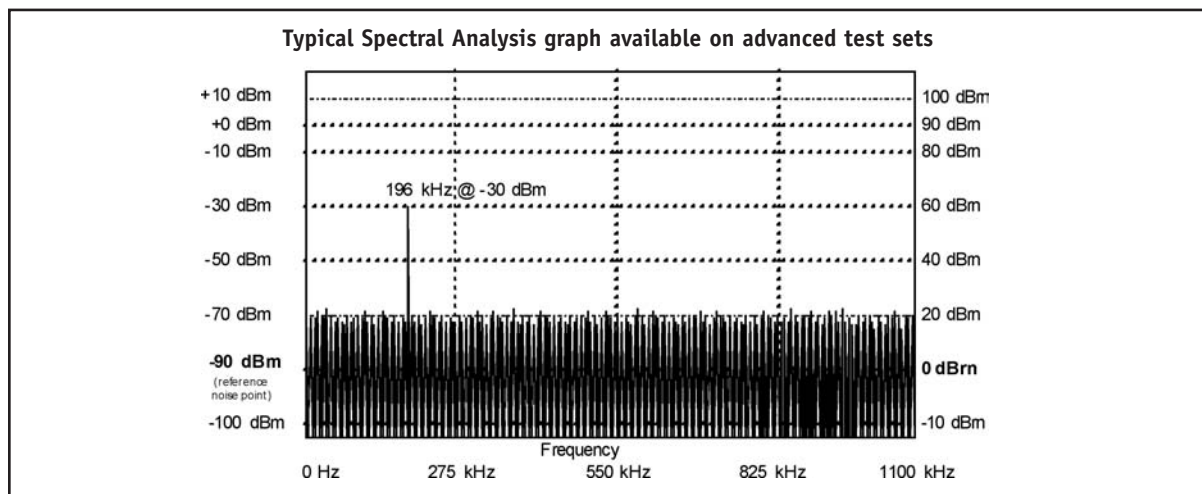
Typically, noise signal power levels are measured in dBm. dBm is defined as the dB power level above the reference noise power level of -90 dBm.

The 196 kHz simple signal shown on the graph below is often used to measure the insertion loss in each pair of an HDSL span:

To convert between dBm and dBm:

$$\text{dBm} = \text{dBm} + 90$$

$$\text{dBm} = \text{dBm} - 90$$



Test sets measure power levels through filters (C, E, F, and G) which include the frequency bands utilized by Voice or DSL services, and excludes others. A test set appends the C, E, F, or G to the end of the power level unit (dBmC, dBmF, dBmC, dBmF, etc.) to signify that the power level has been measured through a filter.



990DSL CopperPro™
Copper Loop Qualification Tester

- 1) A test set is used to “insert” this 196 kHz signal at a power level of 0 dBm on the near end of the span.
- 2) Another test set is used to measure the amount of loss of the signal at the far end of the span.
- 3) Loss is measured or expressed in dB.
- 4) If the 196 kHz signal is transmitted on the near end of the span at a power level of 0 dBm, and is measured on the far end of the span at a power level of -30 dBm, then the loss is:
 $0 \text{ dBm} - (-30 \text{ dBm}) = 30 \text{ dB}$

Also note: If the near end test set transmits a 196 kHz signal @ +10 dBm, and the far end test set measures that same signal @ -30 dBm, then the loss is:
 $10 \text{ dBm} - (-30 \text{ dBm}) = 40 \text{ dB}$.

About the CopperPro™ family of loop testers

The CopperPro family of loop testers from Fluke Networks provides all technicians working in the outside plant a full complement of testing, fault locating and qualification capabilities in a single, rugged, handheld test set. CopperPro is easy to use. Fast. And it offers more capability than any other single loop test set.

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