

SPECTRUM ANALYZER MOD 9102 APPLICATION NOTES

Applications

Fault finding on PCBs with the 1207 Inductive Probe

The Willtek 1207 Inductive Probe is designed for the repair of modern, highly integrated printed circuit boards such as those found in today's mobile phones. High level service centres need to measure the LO frequencies emitted on transceiver components, but do not have test pins available for this task. Most of the latest designs no longer have any contact point for measuring the important synthesizers. The probe helps to overcome this obstacle by measuring the magnetic component of the field emitted by the device under test – a faster, more efficient way for the service technician.

R&D engineers will use the 1207 to test printed circuits, or to perform fast EMC measurements without having to lease an expensive shield room.

Reflection Measurements

The 9130 VSWR/DTF Reflection Measurement Option and the 9160 VSWR/DTF Bridge enable the acceptance and maintenance of professional antenna systems, such as those used for cellular base stations. Every customer operating a fixed or mobile radio with an antenna system can now test the performance and match of his antenna system over the desired frequency range in one view, using the new reflection measurement mode. Designed for cable tests, the new DTF measurement mode shows all relevant problems such as kinks, faulty connectors or water ingress, which can arise along coaxial cables.

The reflection measurement mode, which is part of the 9130 VSWR/DTF Reflection Measurement Option, includes high-precision vector calibration. So the 9102 supports you in measuring the return loss at an accuracy that exceeds cellular phone operators' requirements today. Modern antenna systems for cellular networks are easily tested with the 9130 VSWR/DTF Reflection Measurement Option and the 9160 VSWR/DTF Bridge, supporting the specified measurements with superior performance over the full frequency range.

With its measurement precision and speed as well as its easy handling, the 9102 with the VSWR/DTF options helps to speed up usual antenna tests and to minimise the risk of wrong operation by workers on site. Measurement results stored in the instrument can then be included in your acceptance documentation, thanks to the 9100 Data Exchange Software.

RMS Detector Testing

The 9132 RMS Detector fills the 9102's channel power measurement mode with precision. Broadband signals can be measured more precisely so that the detector is helpful in measuring all kinds of signals that are similar to noise in their spectral structure, such as WCDMA, DVB or WLAN signals. Such signals are smoothed and displayed with the precise RMS level.

Radiation Measurements

The 9102 with the 9131 EMF Measurement Option allows network operators and installers of broadcast transmitters to easily measure the electromagnetic field (EMF) caused by the radio frequency emission from the antenna.

Regulatory bodies and engineering offices can also check the immission of electromagnetic radiation in the range from 100 kHz to 4 GHz, without the need for an external PC. At the price of an instrument that only performs radiation measurements, the 9102 also supports various other applications in the areas of spectrum and network analysis.

Where necessary, the 9102 can be controlled from a remote station via serial interface or even TCP/IP. This makes it the ideal choice for cyclic measurements over a modem or the Internet.

Broadband Spectrum Analysis

You are a satellite (VSAT) ground operator, broadcaster, CATV or mobile phone network operator and you need to measure the spectrum of one or more signals to measure signal level to noise or adjacent channel ratio?

The built-in frequency counter of the 9102 helps you measure the exact frequency of the signal peak on which the marker is currently positioned.

The frequency counter can also be used to tune the LO frequency of modern mobile phones, which is often between 3 and 4 GHz.

With the "Adjacent Channel Power Ratio" (ACPR) measurement the 9102 has a powerful tool to check emissions in the neighbouring channels.

Together with an antenna, the 9102 can easily identify interfering carriers within the observed frequency spectrum, helping during the installation of radio equipment.

Signal Analysis

You are interested in a dedicated signal emitted by a circuit VCO, or in the carrier of a base station?

Harmonics and spurious emissions can easily be identified and evaluated.

Together with its "Adjacent Channel Power Ratio" (ACPR), "Occupied Bandwidth" (OBW) and "Channel Power" measurements, the 9102 includes powerful tools to evaluate the performance of digital broadband carriers, which are used in most mobile phone networks (WCDMA) and in broadcasting (DVB).

Scalar Network Analysis

With the optional tracking generator, the Tracking Edition turns the 9102 into a complete scalar network analyzer which can be used for a wide variety of measurements. All kinds of RF passive and active networks, such as combiners, filters, splitters, cables can be evaluated regarding frequency response, insertion loss and bandwidth. For active components like amplifiers, linearity and gain over frequency are important measurements.

Filter Measurement

Duplex filters, as used in two-way or cellular base stations, can be completely tested with the 9102. Such filters are built of two filter paths, the lower frequency usually used for RX and the higher one for TX. The filters suppress unwanted spurious emissions generated in the receiver and the transmitter, combine signals to and from the antenna and protect the receive path from the RF energy transmitted through the other path.

Amplifier Measurements

The 9102 tests RF amplifiers for many different applications:

high-power amplifiers for mobile radio and broadcast base stations or transmitters, low-noise amplifiers or converters for satellite reception, matching amplifiers, driver amplifiers and many more.

Tower-mounted amplifiers (TMA) are used more and more in cellular networks. Installing a TMA helps the operator improve the link budget by preventing cable losses before they occur. Located directly by the antenna and driven by phantom power provided by the base station via a bias-injector (BIAS-T), these amplifiers are exposed to temperature variations and other weather conditions and need to be checked regularly. This is an ideal measurement for the 9102 with built-in tracking generator!

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