

Millimeter-Wave Spectrum Analysis

Agilent Technologies
and OML, Inc.

Millimeter-wave spectrum analysis using frequency extension harmonic mixers

Millimeter-wave (mm-wave) measurements require the same fundamental tools that engineers use for the RF & microwave spectrum. Frequency extension of a microwave spectrum analyzer or signal analyzer is possible up to 0.325 Terahertz (THz). The key enabler for millimeter-wave measurements is

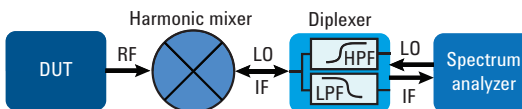
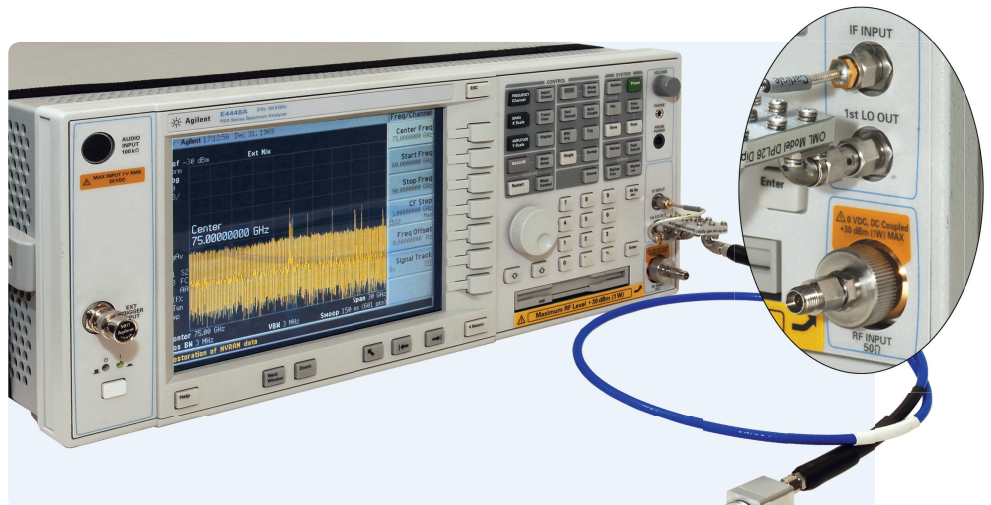
- Perform millimeter-wave spectrum analysis
- Harmonic mixers for frequency extension of your spectrum analyzer
- Extend the frequency range of your Agilent PSA and PXA
- External harmonic mixer simplifies setup and optimizes performance
- Over-the-air, on-wafer, or waveguide connections to your DUT
- Waveguide interface compatible with MIL-DTL-3922/54 and MIL-DTL-3922/67D
- Verify mm-wave transmitter characteristics

harmonic mixer technology. With a harmonic mixer connected to your spectrum analyzer you can overcome the inherent microwave limitations of your instrument allowing you to perform accurate millimeter-wave measurements.

Millimeter-wave measurements are essential for research into next generation technology in areas such as radio astronomy, imaging, communication, semiconductors, space research,

biomedical and homeland security. With a spectrum from 30 GHz to 325 GHz, and greater, the complexity of measurements requires specialized solutions, especially as the wavelengths approach sub-millimeter in length.

OML provides harmonic mixers that connect externally to the Agilent PSA spectrum or PXA signal analyzers for mm-wave band measurements. The external mixer extends the frequency range of the analyzers into the mm-wave bands. By using an external module the connections to the device-under-test (DUT) are closer giving improved dynamic range. It can be interfaced to the DUT via over-the-air, on-wafer, or via waveguide connections. The waveguide



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interface is compatible with MIL-DTL-3922/54 and MIL-DTL-3922/67D.

Once connected, the OML harmonic mixers utilize the predetermined RF, LO and IF to effectively multiply the PSA or PXA microwave capabilities to the mm-wave spectrum. The familiar front panel operation for setup, calibration, measurement, and output are the same, except the readouts are in the mm-wave instead of microwave spectrum.

The Agilent PXA is plug-and-play compatible with the MxxHWDX series of harmonic mixers from OML. With electronic CSV data, this part number

simplifies import of correction factors to the PXA. Similarly, the Agilent PSA is compatible when configured with an external diplexer (DPL-26). One popular application is FCC Part 15 emissions compliance testing from 40 GHz to 200 GHz, which is conducted when using additional standard gain horn antennas with harmonic mixers.

OML's external harmonic mixers when combined with an Agilent PSA spectrum analyzer or PXA signal analyzer allow you to extend the frequency range of your instruments to perform accurate measurements on your millimeter-wave band circuits and devices.

To learn how this solution can address your specific needs please contact Agilent's solutions partner, OML, Inc.

www.agilent.com/find/OML



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Solutions Partner



System Components

Agilent Technologies

N9030A	PXA signal analyzer
N9030A-EXM	External mixing
E444xA	PSA spectrum analyzer
E444xA-AYZ	External mixing

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M28HWDX	WR-28, 26.5-40 GHz
M22HWDX	WR-22, 33-50 GHz
M19HWDX	WR-19, 40-60 GHz
M15HWDX	WR-15, 50-75 GHz
M12HWDX	WR-12, 60-90 GHz
M10HWDX	WR-10, 75-110 GHz
M08HWDX	WR-08, 90-140 GHz
M06HWDX	WR-06, 110-170 GHz
M05HWDX	WR-05, 140-220 GHz
M04HWDX	WR-04, 170-260 GHz
M03HWDX	WR-03, 220-325 GHz
DPL-26	External diplexer for Agilent PSA
2378H231	Part 15 bundle, 40-220 GHz

-WR-19, WR-12, WR-08, WR-05
-Plus standard gain horn antennas

Note: X adds CSV data. Model numbers for PSA are MxxHWD (without CSV data)

Agilent and its Solutions Partners work together to help customers meet their unique challenges, in design, manufacturing, installation or support. To learn more about the program, our partners and solutions go to www.agilent.com/find/solutionspartner

OML, Inc. is a premier supplier of innovative millimeter and sub-millimeter wave frequency extension products for vector network analyzers, scalar network analyzers, spectrum analyzers, converters, and signal generators. Our solutions empower engineers in R&D and manufacturing to pursue opportunities in emerging applications spanning radio astronomy, communication, imaging, space research, and homeland security www.omlinc.com

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