

A0070A Optical Frequency Analyzer

SYCATUS Corporation

- Optical frequency modulation analysis for FMCW LiDAR lasers
- Real-time time-domain waveform measurement like oscilloscope
- Unaffected by intensity modulation of laser signal
- High measurement accuracy with low trace noise and high linearity
- Easy measurement without prior adjustment
- Integratable into A0040A Optical Noise Analyzer

SYCATUS provides a new solution of A0070A Optical Frequency Analyzer for the measurement of FMCW LiDAR lasers.

FMCW LiDAR is a promising distance sensing technology due to its high sensitivity, excellent tolerance to background radiation and inter-LiDAR interference and less risk to eye safety.

FMCW LiDAR uses a laser beam with triangular optical frequency modulation. The optical frequency modulation rate (Hz/s) is the key parameter for distance measurement. The laser beam is generally generated by direct modulation of a semiconductor laser.

The optical frequency modulation rate of the semiconductor laser is not necessarily constant and varies transiently due to temperature changes caused by modulation. In addition, direct modulation of a semiconductor laser modulates not only the optical frequency but also the optical intensity. The optical frequency modulation characteristics must be measured in the time domain without the influence of intensity modulation.

A0070A Optical Frequency Analyzer shows the realtime optical frequency modulation waveform like an oscilloscope. SYCATUS' unique method enables measurement without being affected by optical intensity modulation. A0070A's accurate and easy measurements accelerates the development and manufacturing of lasers for FMCW LiDAR.

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The A0070A requires no adjustment prior to measurement and displays waveforms as soon as the laser beam is input. Low trace noise eliminates the need for averaging and enables real-time measurements. High linearity ensures accurate measurement results.

A0070A is also available as an additional option to A0040A Optical Noise Analyzer, which measures the optical frequency noise spectrum of lasers. The optical frequency noise is an important factor in determining the distance measurement accuracy of FMCW LiDAR. By using A0070A as an additional option to A0040A, both optical frequency modulation and optical frequency noise characteristics can be evaluated in one system, which increases the investment efficiency.

A0070A is a system product consisting of SYCATUS test set and software with Keysight Technologies signal analyzer and VSA software.

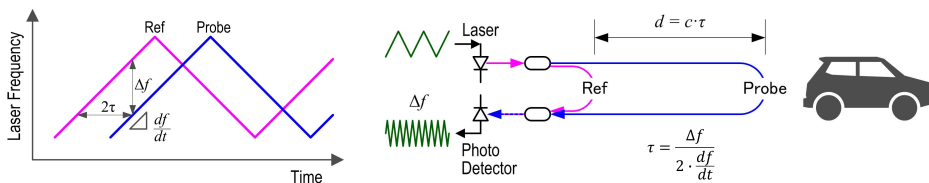
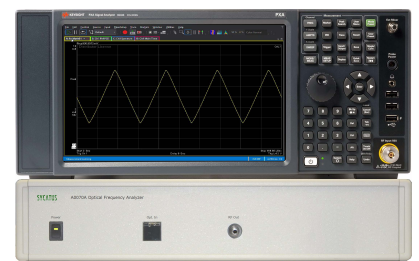


Fig. 1 FMCW LiDAR Concept

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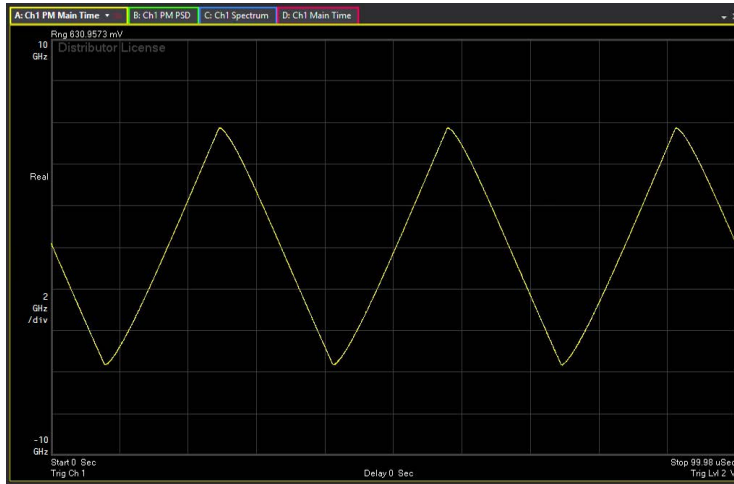


Fig. 2 Optical Frequency Modulation Measurement Example

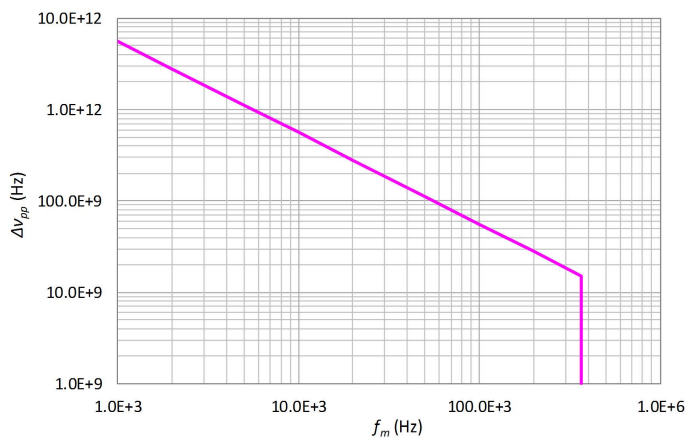


Fig. 3 Maximum Measurable Modulation Amplitude as a function of Repetition Rate

Specifications

Items	Specification
Optical Wavelength Range	1520 - 1620 nm
Optical Frequency Modulation Repetition Rate	370 kHz max.
Optical Frequency Modulation Amplitude	560 GHz _{p-p} max. (Repetition Rate: 10 kHz) 56 GHz _{p-p} max. (Repetition Rate: 100 kHz)
Functions	Optical Frequency Modulation Waveform Optical Frequency Modulation Spectrum

Order Information

SYCATUS	
Optical Frequency Analyzer	A0070A
Optical Test Set	
System Software (Installed in Signal Analyzer)	
Remote Control Software (Available in Windows PC)	
Keysight Technologies	
X-Series Signal Analyzer	N9010B EXA, N9020B MXA or N9030B PXA
Vector Signal Analysis Software	89601200C

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