

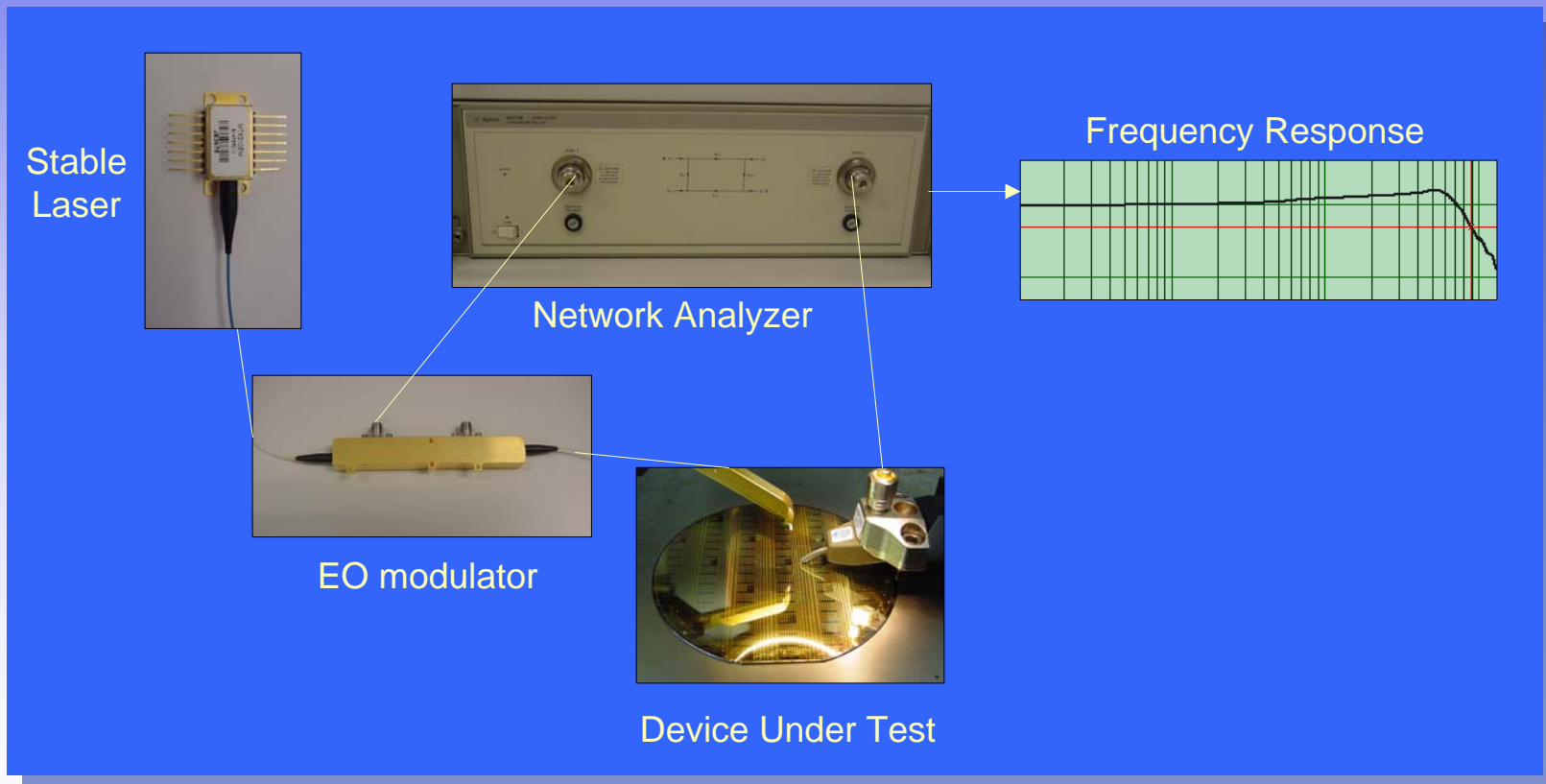
Photodiode Speed Test

- Low speed response measurement
 - Oscilloscope (with either analog or digital optical input)
- High speed response measurement (~10GHz to >100 GHz)
 - Frequency domain (network analyzer, optical heterodyne)
 - Time domain (impulse response)

Here, we are addressing high speed response measurement

Frequency Domain

Optical Network Analyzer or Electrical Network Analyzer with Optical Conversion:



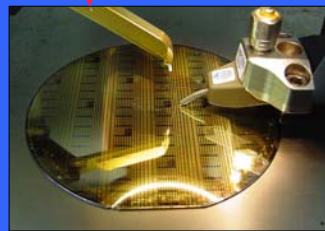
Frequency Domain

Optical Heterodyne System

Tunable Narrow-Linewidth Lasers

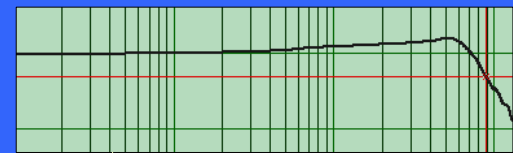


Beat Frequency (10-100GHz)



Device Under Test

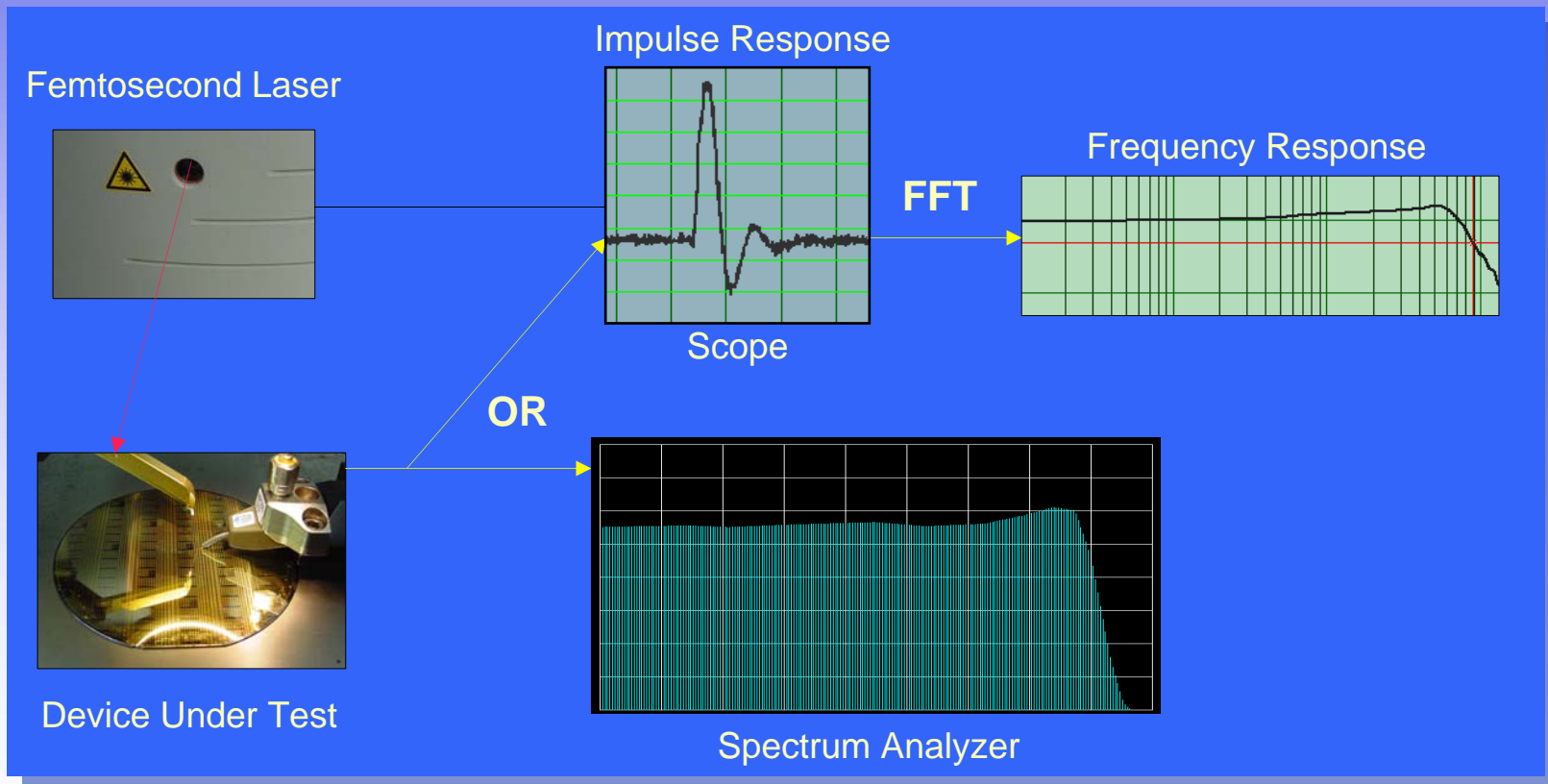
Frequency Response



Broadband Receiver

Time Domain

Pulsed Laser with Spectrum Analyzer or with Sampling Scope



Method Comparison

Method	Comments
Frequency Domain Network Analyzer	Expensive, Calibration Issues
Frequency Domain Optical Heterodyne	Not widely available, Frequency accuracy issues
Time Domain with Spectrum Analyzer	Inexpensive, Inaccurate due to errors in spectrum analyzer amplitude reading, no impulse response
Time Domain Impulse Response	Moderate cost, gives both impulse response and frequency response