

R&S® ZVA

Network Analysis Video Tutorials

Application Note

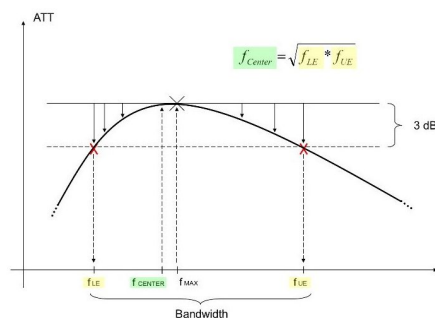
Network Analysis Tutorial - 5 Videos — 1MA50_0e

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1 Motivation

Welcome to this introductory video show about the R&S® ZVA family of network analyzers. Network analysis is sometimes considered to be cumbersome and difficult to understand, a very offputting reputation for newcomers to network analyzers. To help you look at network analyzers in a different light, we have created this video series. We have intentionally refrained from explaining any theory in depth. Rather, we want to show you how to operate our analyzers for simple and useful applications.



As well as just watching this video show, you can also use it as a guide and try yourself. All the operational steps shown only require a standard RF power amplifier which should be available in almost every lab. The procedures shown in this video are designed to be independent from each other. So you can choose whether you go through the complete show from the beginning to the end, or just pick out the procedures of special interest to you. So, before we get properly started, we hope you enjoy this video show and much success in becoming familiar with network analysis in general, and our R&S products in particular. Start now with selecting and watching one of the videos.

2 Contents and Playing Time

Following table summarizes the video contents. There are five entries according to the five videos available. Each entry consists of a bold printed headline which provides title, playing time and filename. The five files can be directly downloaded from this internet location. In the grey shaded areas below the headlines a small summary is given for each video.

Contents	Playing Time (min:secs)	File
GUI-Intro and Help System, provides a basic introduction to the graphical user interface (GUI) of the R&S®ZVA vector network analyzer. Basic test setups and measurements are explained to get familiar with how to operate a vector network analyzer.	12:27	ZVA_Intro_01.mp4
Calibration, explains the calibration of a vector network analyzer (VNA) including how to set channel parameters and load calibration kit characteristics. It shows how to perform TOSM calibration, save settings and calibration and how to handle multiple setups using a vector network analyzer.	9:06	ZVA_Calibr_01.mp4
Filter Tests, shows how to perform RF filter tests using a vector network analyzer (VNA). The video explains the presetting and initialization of the instrument, the principles of the automatic bandfilter test mode, how to operate bandwidth and phase measurements and how to reduce the sweep frequency. Further, group delay measurements and how to evaluate the results are demonstrated.	6:27	ZVA_Filt_01.mp4
Amplifier - Gain and Matching, explains how to perform linear amplifier tests using a vector network analyzer (VNA). The video shows how to preset the VNA, mount the device under test and measure the gain. The principles of matching measurements are explained and S22 measurements are demonstrated. Finally, evaluation with markers and storage of the resulting data is addressed.	8:43	ZVA_AmplG_01.mp4
Amplifier - Large Signal Operation, demonstrates how to perform non-linear amplifier tests using a vector network analyzer (VNA). The principles of compression measurement and how to perform with a VNA are explained. This includes basic setting and calibration reload, power sweep preparation and the evaluation of the results.	5:33	ZVA_AmplLS_01.mp4

3 Video Location and Usage

3.1 Access via R&S homepage

Goto "www.rohde-schwarz.com/appnote/1ma50" and download the videos along with the Application Note at hand.

3.2 Access via YouTube

YouTube access as shown below :

- | | |
|--|---|
| [1] GUI-Intro and Help System | http://youtu.be/gqVa_wg9234 |
| [2] Calibration | http://youtu.be/RxwfMKhS4S0 |
| [3] Filter Tests | http://http://youtu.be/nB6LhBNRw7k |
| [4] Amplifier - Gain and Matching | http://http://youtu.be/6B7tS-Mj3BU |
| [5] Amplifier - Large Signal Operation | http://http://youtu.be/0mvX1ds7AiY |

3.3 How to use the videos on portable devices

Regarding resolution the videos are prepared to be watched on small screens, for instance on iPod or smartphones. This is possible because of the intense zoom approach when showing even small objects.

Following text gives a guideline how to get and playback the videos on an iPod:

- ** Download the five MP4 files from R&S Intranet to your local PC
- ** Connect iPod to USB and open "iTunes"-software
- ** Within iTunes select menu item "Files Add files to Mediathek" (or similar)
- ** Select the five MP4-files using the file selection window within iTunes and press 'open'
- ** Either pull the files from the Mediathek-Window to the iPod-Device symbol using ...
... the mouse or start "synchronize iPod with Mediathek"
- ** Pull off the iPod from USB and play the videos offline

4 References

- [1] R&S® ZVA Vector Network Analyzer, High performance up to 110 GHz with up to four test ports, Product Brochure, 10.00, Aug. 2012, PD 5213.5680.12, available from <http://www.rohde-schwarz.com>, search topic "ZVA"
- [2] Microwave and beyond, (PDF-)Poster English, PD 3606.7582.82, 01.00, Oct. 2012, available from <http://www.rohde-schwarz.com>, search topic "Microwave and beyond"
- [3] Zohrabian R., 2013, VNA Calibrations, Speed Up Multiport, Microwaves & RF, July 2013, pg. 76
- [4] R&S® ZVA / R&S® ZVB / R&S® ZVT, Vector Network Analyzers Operating Manual, 2013, 1145.1084.12 - 21, available from <http://www.rohde-schwarz.com>, search topic "ZVA"
- [5] Signal integrity - time domain skew between two differential lines using R&S® ZVA , video series, available from <http://youtu.be/LPEErTvrOU>
- [6] Naseef, Minihold, Bednorz, 2013, "Testing S-Parameters on Pulsed Radar Power Amplifier Modules", R&S Application Note Nr. 126, available from <http://www.rohde-schwarz.com/appnote/1ma126>, video available for download