

Measurement and Characterization Methods of Electronic Components Based on NI ELVIS Platform



Overview

The «*Measurement and Characterization Methods of Electronic Components*» lab is based on the NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS II) platform. The software is developed in the LabVIEW graphical programming environment.

The lab is used to perform laboratory works on «*Electronics*», «*Measurement technology*», «*Automated testing systems*» and «*Information and measurements systems*». It allows a user to study main characteristics of the following electronic components:

- Analog to digital converter (ADC)
- Digital to analog converter (DAC)
- Operational amplifier
- Transistors
- Diodes
- Passive components

The lab offers a sample scope for studying measurement principles of main characteristics of widely-used components and best enables the participation of a student in laboratory researches and measurements.

Features

- User-friendly graphical interface
- Possibility to select laboratory works from the menu
- Theoretical materials and step-by-step instructions on connections and performance of practical experiments
- Instructive soft front panels for measuring and setting devices
- Special terminal assembly on the bench for performing independent laboratory works

Hardware and software

- NI ELVIS II (or NI ELVIS II+) platform
- Lab board for NI ELVIS II platform
- Lab software
- User manual

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List of labs

ADC parameters

1. Least significant bit and full scale range
2. Offset and gain errors
3. Integral and differential nonlinearities
4. Total harmonic distortion (THD)
5. Spurious-free dynamic range (SFDR)
6. Signal-to-noise and distortion ratio (SINAD)
7. Signal-to-noise ratio (SNR)
8. Power consumption

DAC parameters

9. Least significant bit and full scale range
10. Offset and gain errors
11. Integral and differential nonlinearities
12. Total harmonic distortion (THD)
13. Spurious-free dynamic range (SFDR)
14. Signal-to-noise and distortion ratio (SINAD)
15. Signal-to-noise ratio (SNR)
16. Power consumption

Operational amplifier parameters

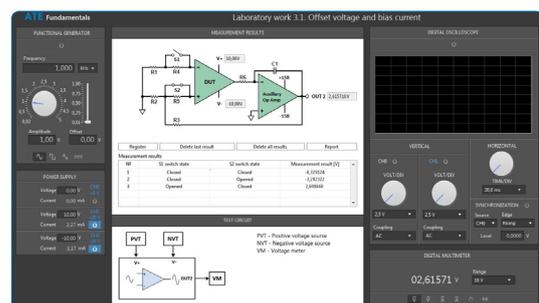
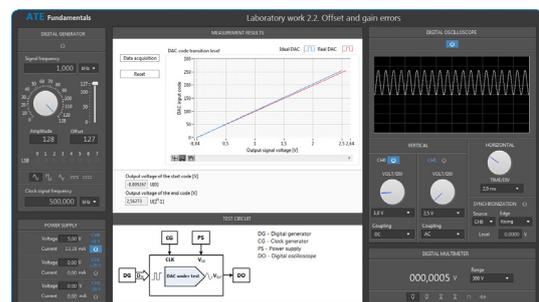
17. Offset voltage and bias current
18. Gain
19. Common-mode rejection ratio (CMRR)
20. Power supply rejection ratio (PSRR)
21. Slew rate
22. Amplitude-frequency response

Transistor parameters

23. Input impedance (h11)
24. Reverse voltage transfer ratio (h12)
25. Forward current transfer ratio (h21)
26. Output admittance (h22)
27. Transconductance
28. Transistor input characteristics
29. Transistor output characteristics

Diode parameters

30. Current–voltage characteristic of standard diode
31. Current–voltage characteristic of Schottky diode
32. Current–voltage characteristic of Zener diode
33. Current–voltage characteristic of TVS diode



For additional information please contact us: info@pintegration.org