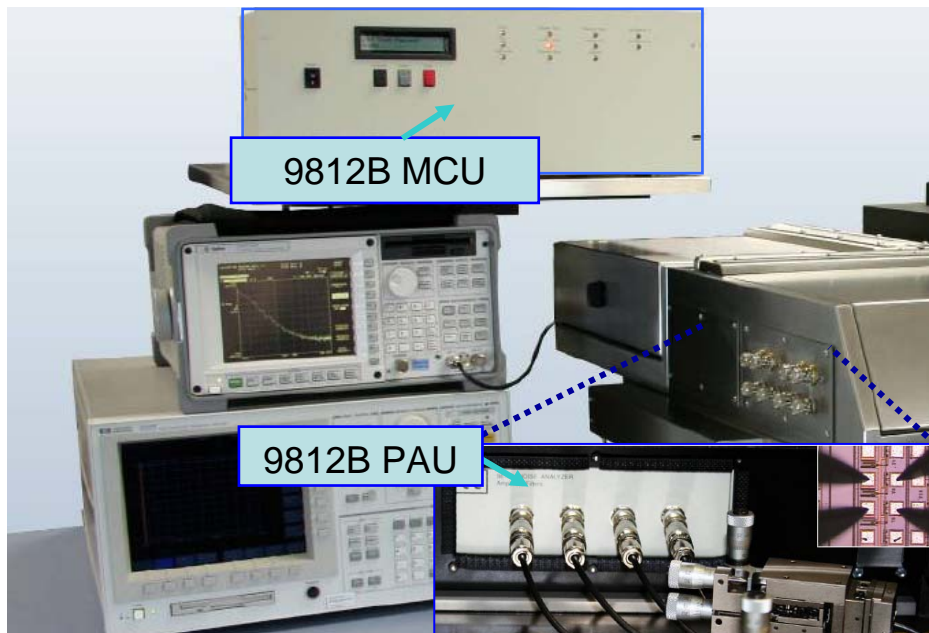
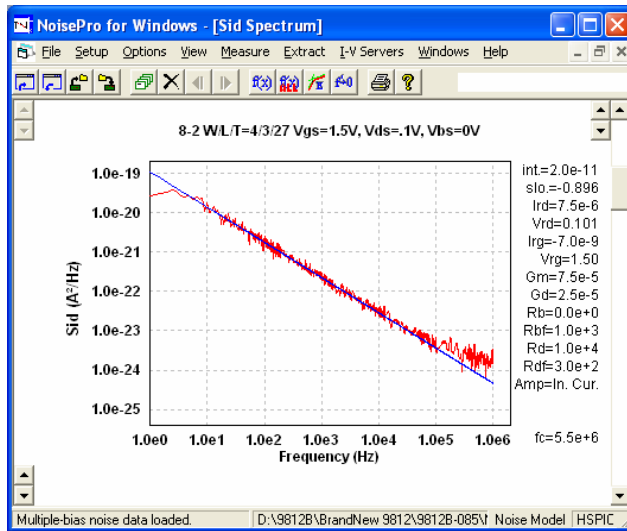


9812B & NoisePro

Turn-Key Wafer-Level Low Frequency Noise Characterization System

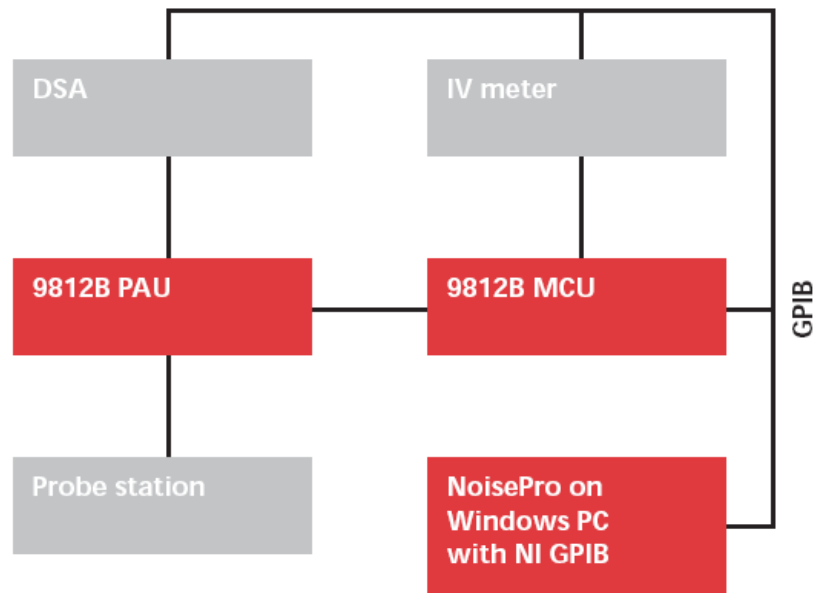


INTRODUCTION

ProPlus Design Solutions, Inc

2860 Zanker Road, Suite 204, San Jose, CA 95134, USA www.ProPlusSolution.com

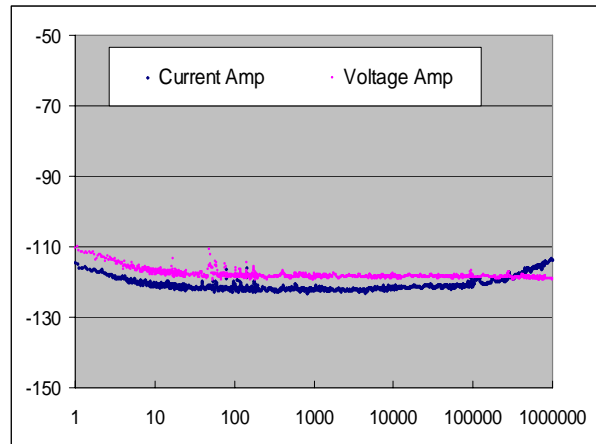
1/f noise is an unavoidable consequence of semiconductor technology. Its impact on circuit performance is significant in today's low-voltage, high-performance, mixed-signal, RF, and deep submicron designs. Therefore the ability to accurately characterize 1/f noise becomes a fundamental requirement for design. The ProPLUS *NoisePro* system—including **9812B** analyzer hardware and *NoisePro* software with automatic control and built-in 1/f noise SPICE model parameter extraction routine—provides the industry's only off-the-shelf, proven 1/f noise system.



ProPLUS 1/f Noise Measurement System

KEY BENEFITS OF NOISEPRO SYSTEM

- ✓ The chassis of 9812B are constructed of heavy gauge steel to provide maximum shielding from electrical and magnetic interference.
- ✓ Provides to measure noise FET, BJT, Diode and resistor on the wafer as well as packaging device
- ✓ The wafer level automatic flicker noise measurement makes it possible to monitor gate oxide quality without destroying any devices under test
- ✓ Two battery supplied inside 9812B system. No interruption required for recharging.
- ✓ Detachable pre-amplifier unit can be placed closer to DUTs or in the measurement chamber, which greatly reduce the system noise floor. The battery operated current amplifier provides as low as 0.5pA/sqrt (Hz) @ 1 KHz floor noise and voltage amplifier provides 1nV/sqrt (Hz) @ 1 KHz floor noise.



Low Floor Noise of 9812B System

- ✓ Available to measure up to 1MHz
- ✓ It provides system gain measurement capabilities
- ✓ Performs I-V tests based on the bias condition for noise measurement

NOISEPRO SYSTEM FEATURES

MEASURE ON THE WAFER AND AFTER PACKAGING

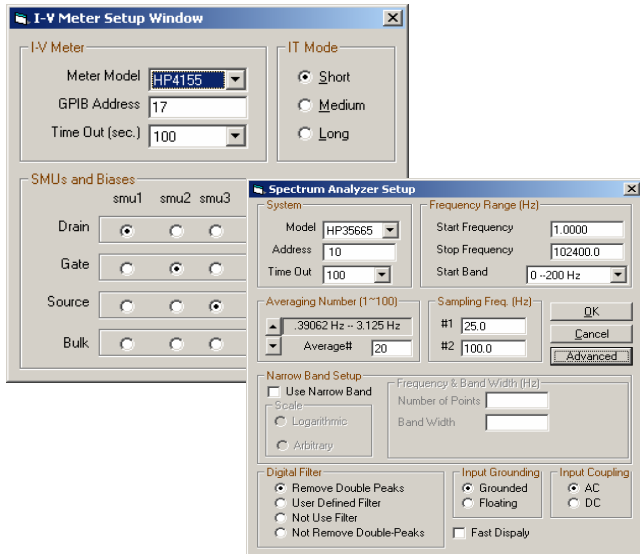
- ✓ Allows you to set up an integrated, wafer-level, turn-key, low-frequency noise characterization system
- ✓ Makes it easier to characterize noise versus temperature relationships

AUTOMATIC MEASUREMENT SET-UP

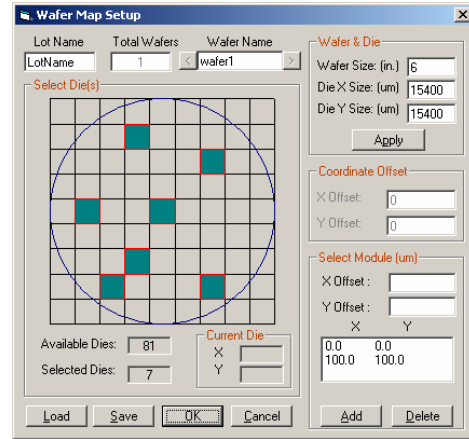
- ✓ Easy set-up of bias conditions, measurement frequency ranges, averaging number per each frequency decade, and other advanced measurement configurations.
- ✓ *NoisePro* drives **9812B** hardware and other instruments in the system and automatically measure all biases and frequencies one after the other and from die to die and device to device
- ✓ *NoisePro* estimates how much time the whole measurement will take and facilitates a more efficient time management.

CALIBRATION

- ✓ Provides special routines to measure the system noise floor and chamber noise to verify the system noise shielding level
- ✓ Allows you to select and measure different resistors inside **9812B** hardware for resolutions calibration



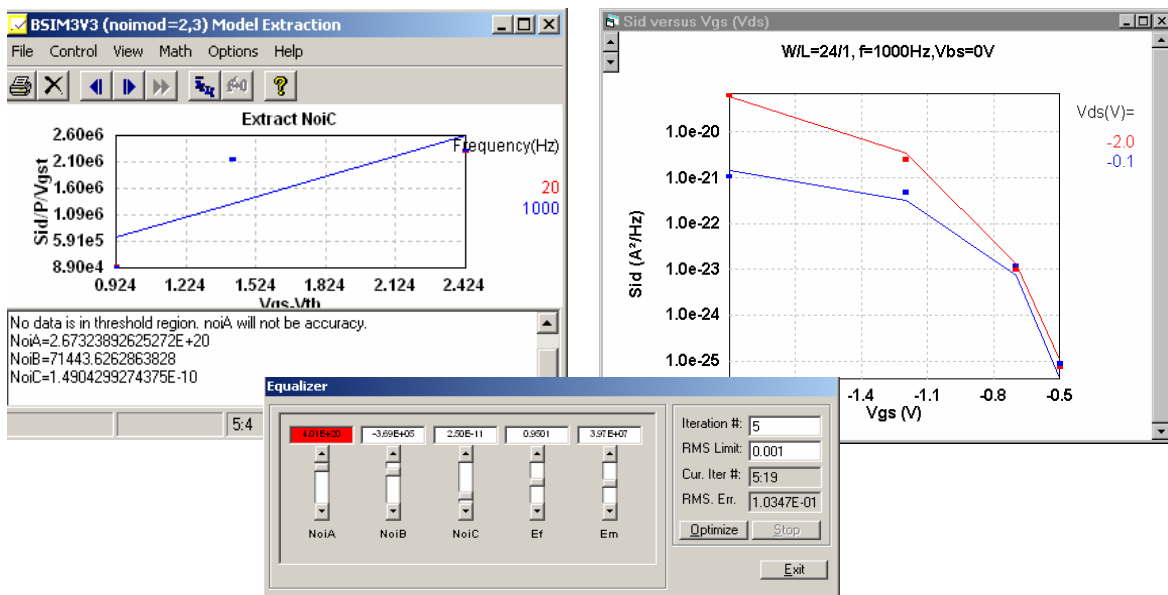
User-friendly Measurement Setup Interface in NoisePro



Wafer Map Setup for Automatic Measurement

NOISE PARAMETER EXTRACTION

- ✓ Provides noise characterization and model parameter extraction for MOSFETs, BJTs, diodes and resistors etc. public and proprietary models.
- ✓ Support V-mode and I-mode biasing modes with user selectable accuracy.
- ✓ Built-in DC parameter extraction for most popular Spice models such as BSIM3v3.



Noise Parameter Extraction/Optimization in NoisePro

9812B HARDWARE SPECIFICATIONS

- ✓ Current Pre amplifier :
 - ✧ Frequency response 0.5Hz-1MHz
 - ✧ Noise Floor: 0.5pA/ $\sqrt{\text{Hz}}$ @1KHz
 - ✧ Battery Operated
- ✓ Voltage Pre amplifier
 - ✧ Frequency response 1Hz-1MHz
 - ✧ Noise Floor: 1nV/ $\sqrt{\text{Hz}}$ @1KHz
 - ✧ Battery Operated
- ✓ DUT Impedance matching
 - ✧ Output: 100ohm to 1M ohm, programmable
 - ✧ Input: 0 to 100M ohm, programmable
- ✓ DUT Type
 - ✧ IGFET, BJT, Diode and Resistor
 - ✧ +- 40V maximum bias condition
- ✓ SMU Noise Filters
 - ✧ Cut-off Frequency : 0.1-1Hz, programmable
- ✓ Battery Power Supply
 - ✧ 2 Battery operated
- ✓ System Noise Resolution
 - ✧ $< 2 \times 10^{-26} \text{ A}^2/\text{Hz}$
- ✓ Power
 - ✧ 100/120/220/230-240V 47-63Hz, 60VA Max

SYSTEM REQUIREMENT

To measure the noise characteristics of semiconductor devices using **9812B** and the parameter extraction software **NoisePro** for Windows, the following equipments are required:

1. IEEE488 control card and interface driver for Windows. **NoisePro** for Windows supports the National Instruments PC or AT GPIB control cards
2. HP4142, HP4145A/B, HP4155A/B/C HP4156 Semiconductor Parameter Analyzer, or K4200. Source Measure Units (SMUs). (At least three SMU Units and one GND Unit are required.)
3. Agilent 89410A, 3561A, 35665, 35670 Dynamic Signal Analyzer or SR780, 785 Network Signal Analyzer.
4. Cascade Summit, Cascade with Nucleus or SUSS MicroTec Probe Station (Only for automatic wafer level measurement)
5. A PC compatible computer with Windows operating system.

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ProPlus Design Solutions, Inc. is the leading provider of semiconductor device modeling products that guarantees accurate transfer from semiconductor process technologies to integrated circuit designs. The Company, with more than 10 years experiences serving as the leader for the industry in the Spice modeling field, offers full range of modeling tools, professional modeling and consulting services to electronic and semiconductor companies.

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