

# Maury Microwave

## Introduces ...

*The Ultimate Characterization Tool  
for the Researcher*

# MT4463



The First Large - Signal Network Analyzer



*“Characterize the nonlinear behavior of  
RF, microwave and fast switching components  
with fundamental and complete measurements”*

# *Outline*

- From Linear to Nonlinear Behavior
- Transistor Modeling and Component Analysis ... today
- What does MT4463 give you?
- The key values
- MT463 is a long-term investment
- Conclusion

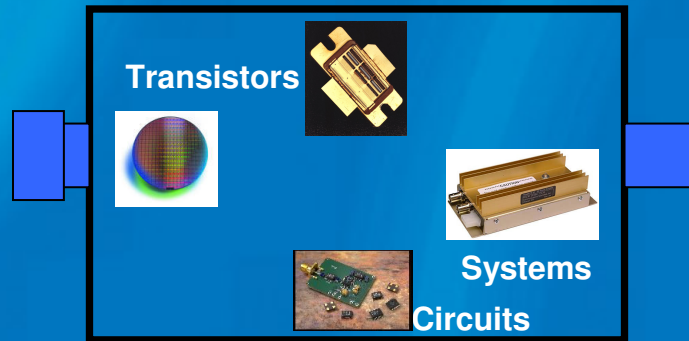
Linear Behavior



*From modeling to testing*

Vector Network Analyzer

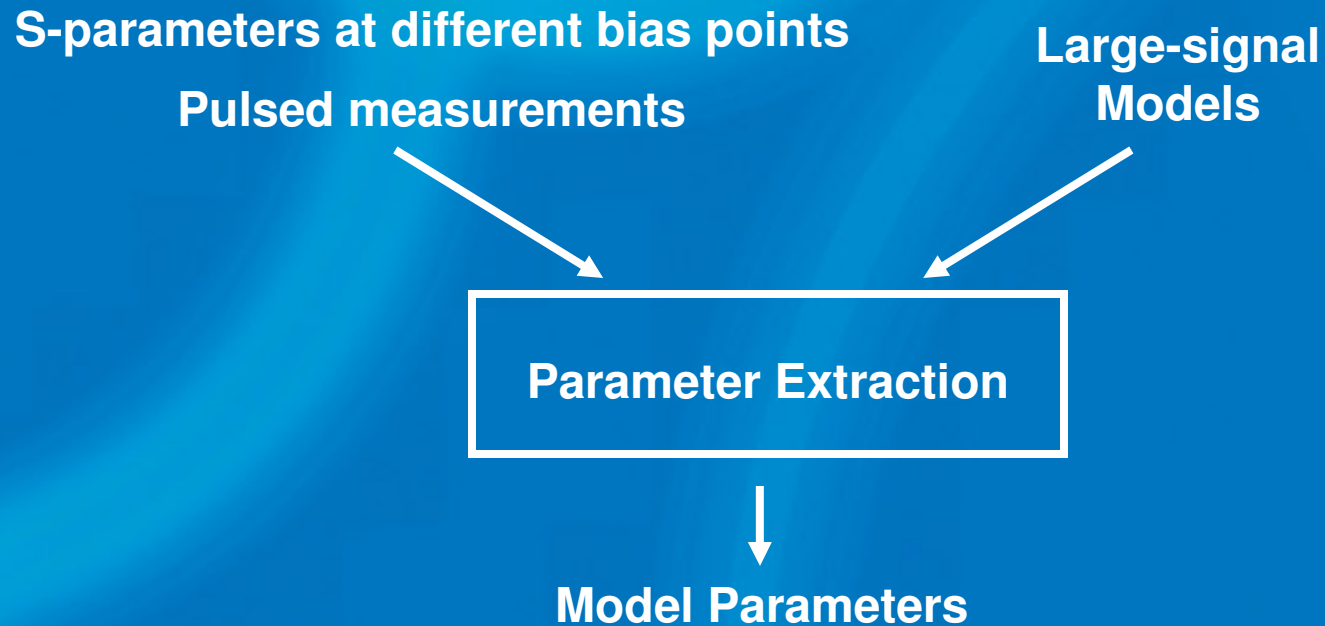
S-parameters



Non - Linear  
Behavior



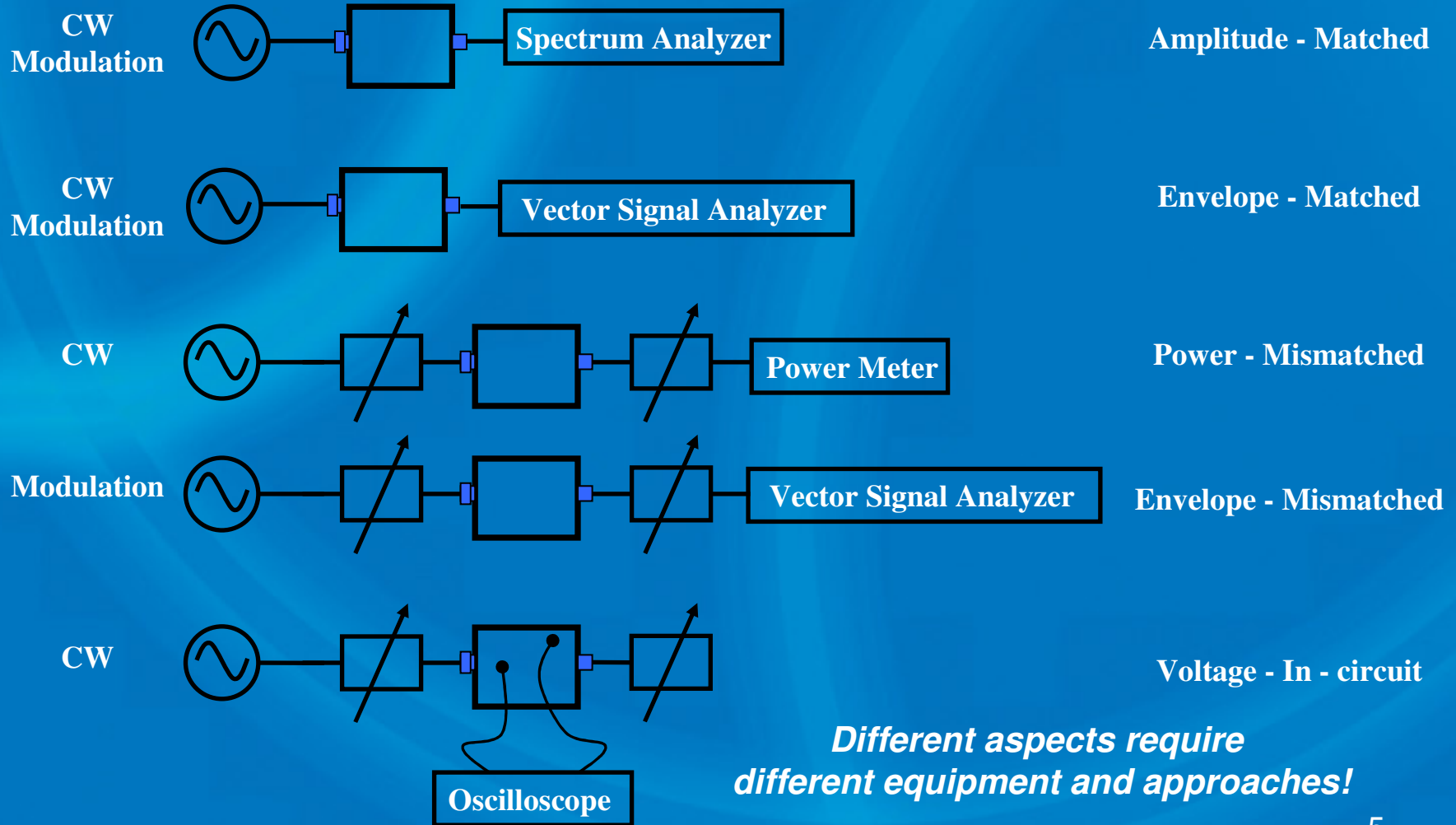
# Transistor Modeling and Nonlinear Behavior ... today



**But...**

- *What about the performance of the models under realistic conditions?*
- *Why not using the same equipment / approach at device level and system level?*
- *What about building much better large-signal models  
using directly large-signal measurements?*

# Component Analysis and Nonlinear Behavior ... today



*Different aspects require different equipment and approaches!*

***But now ...***

***One Instrument***

***One Approach***

***From Transistor to System***

***From Characterization,  
to Modeling and Simulation***

# ***MT4463...***

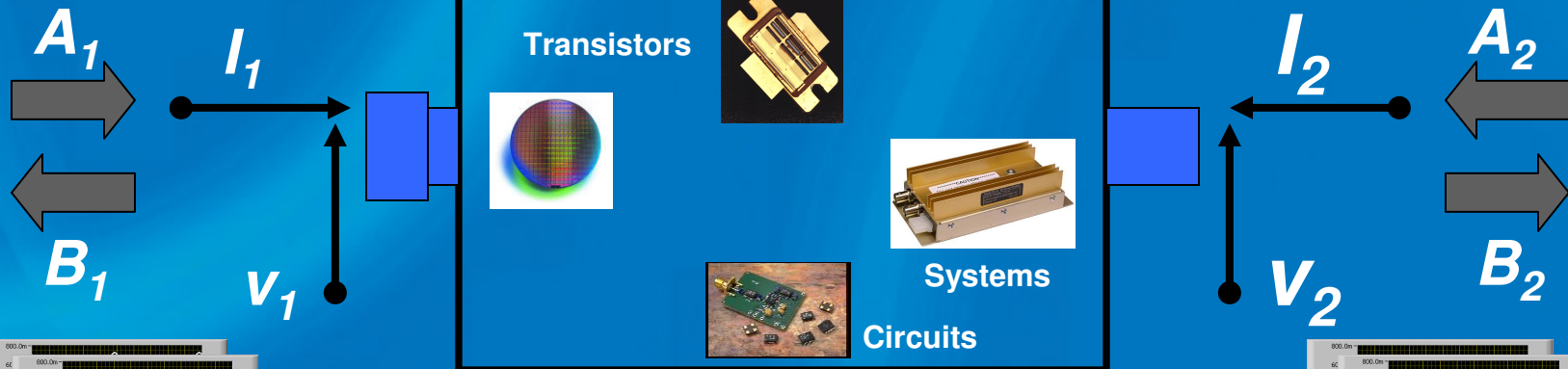
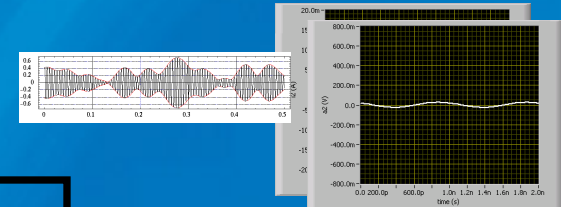
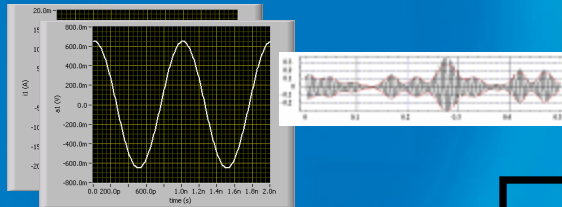
***Finally a fundamental new HF instrument,  
enabling you to impact Design and Test  
by developing technology***

***“Beyond S-parameters”***



# MT4463 Measures...

Accurately  
Completely  
In a traceable way



*In following domains*

Frequency domain

Frequency - time domain

Time domain

*Under realistic conditions*

Continuous wave

Periodic Modulation

Source and Load Tuning

*Compatible with  
Simulation Tools*

# MT4463... Key Values

- Complete(\*) and accurate (\*\*) component measurements
  - only obtained in a few home-brewed measurement systems
  - at the component level
  - in a network analyzer sense
  - under small - signal (linear) and large-signal (nonlinear) conditions
  - in a mismatched environment
- This data provides you with all necessary information
  - to understand better the behavior of the component under test, like breakdown effects under realistic conditions
  - to assure you that the extracted models and model libraries will perform adequately under realistic conditions
  - to improve your models to perform well under realistic conditions
- With your creativity, new research horizons will open

(\*) IF behavior is presently still missing

(\*\*) absolutely calibrated

# MT4463... Key Features

- Single connection to perform calibrated measurements
  - S-parameters
    - CW stimulus
    - Periodic modulation stimulus
    - Power control
    - De-embedding
  - Complete component characterization by Incident / Reflected waves or Voltages / Currents
    - CW stimulus
    - Periodic modulation stimulus
    - De-embedding
    - Mismatched environment
- Easy-to-use graphical user interface
- Powerful scripting language to develop your own processing
- Open system
  - Callable from your tools
  - Add your own stimulus etc ...

# NVNA Users' Group, sponsored by ARFTG



- A growing discussion forum on LSNA Technology
- Mission
  - “This informal discussion group is devoted to sharing information and issues related to instrumentation utilized in vector large-signal network analysis of microwave circuits and systems that contain nonlinear elements.
- Topics include
  - Large-signal measurements utilizing nonlinear vector network analyzers (NVNAs), e.g. Microwave Transition Analyzers (MTAs) and Large-Signal Network Analyzers (LSNAs). NVNA measurements in conjunction with loadpull, sampling oscilloscopes, vector signal analyzers, and other test equipment used to perform large-signal measurements.
- When
  - We hold meetings twice a year: At the ARFTG conference associated with the IEEE International Microwave Symposium in June and in the fall. Starting this fall, the fall meetings will alternate between the ARFTG conference and the European Microwave Conference, giving more of the European NVNA Users a chance to participate.”

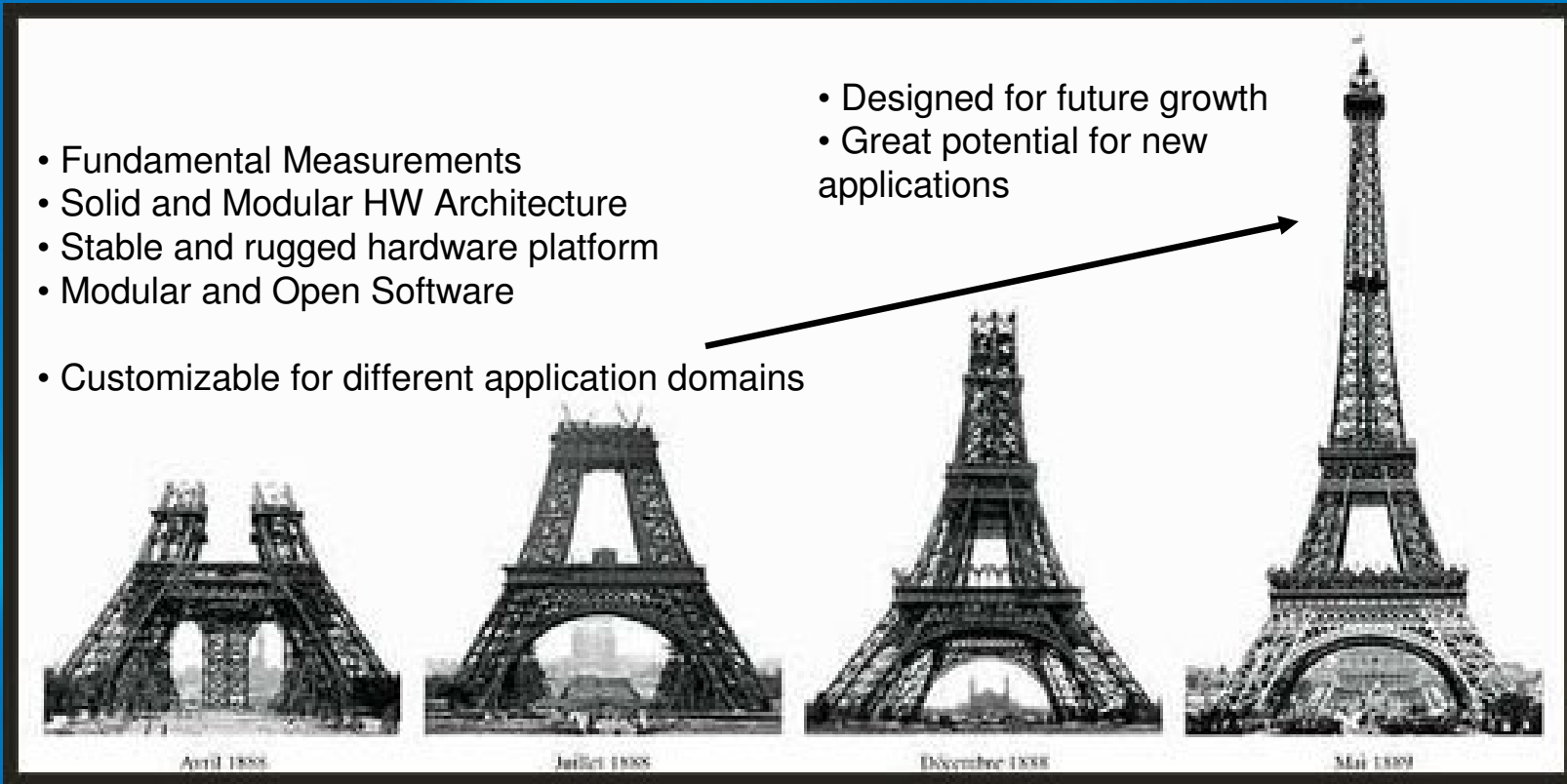
*(From [http://www.arftg.org/LSNA/lсна\\_meetings.htm](http://www.arftg.org/LSNA/lсна_meetings.htm))*

# MT4463...

“Evolutionary and a secured Long-Term Investment”

- Fundamental Measurements
- Solid and Modular HW Architecture
- Stable and rugged hardware platform
- Modular and Open Software
- Customizable for different application domains

- Designed for future growth
- Great potential for new applications



You can help building “MT4463 Eiffel Tower”

# ***MT4463 ...***



## ***“Beyond S-parameters”***

### ***Do not hesitate to contact us***

***Technical information***



**<http://www.nmdg.be/>**

***Sales information***



**<http://www.maurymw.com/>**