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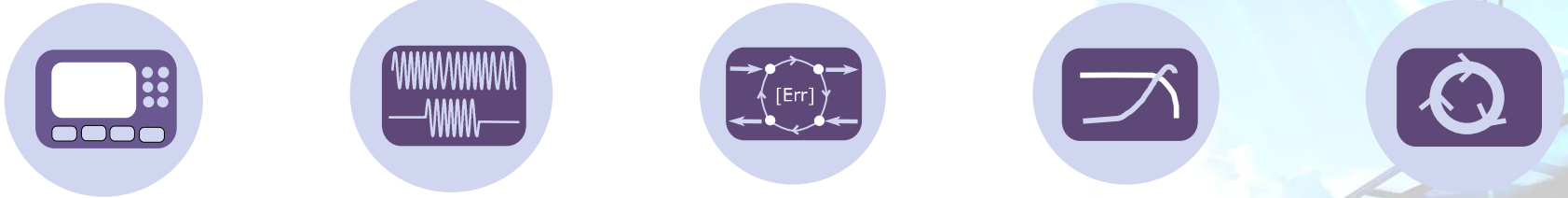
Advanced Modeling for Computer-Aided Design

IQSTAR

Accelerate and Automate your Circuit Test Flow



Helping our customers to design smart and safe communication systems !

www.amcad-engineering.com

INTRODUCTION

IQSTAR is an advanced measurement software designed for efficient and accurate test of circuits, verification, analysis or tuning of filters, RF amplifiers (LNA, MPA, HPA)… The software is equally suited for S-parameters, CW, Pulsed, 2-tones or modulated signal.
IQSTAR requires no programming skills to set it up. It supports developers to design the best products and it also allows production to guaranty and document products quality.

IQSTAR's Key Features

- Turn-Key software to set instrument's agnostic test bench
- Automated Characterization Test Flow from S-parameter to Modulated signal measurements
- Advanced an customizable data visualization & data processing

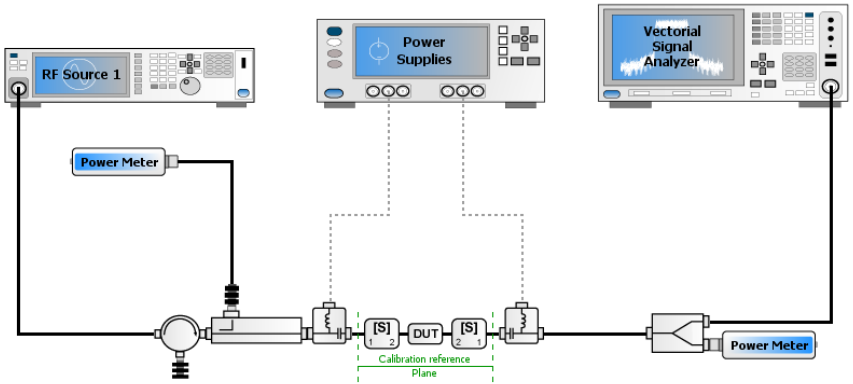
Applications

- Telecommunication Amplifier (LTE, OFDM, UMTS)
- Radar, MRI amplifier ▶ T&M ▶ RF Filter

SCHEMATIC-one set-up multi-configuration

The flexibility of the schematic editor allows to build a test set function of the application and available instruments.

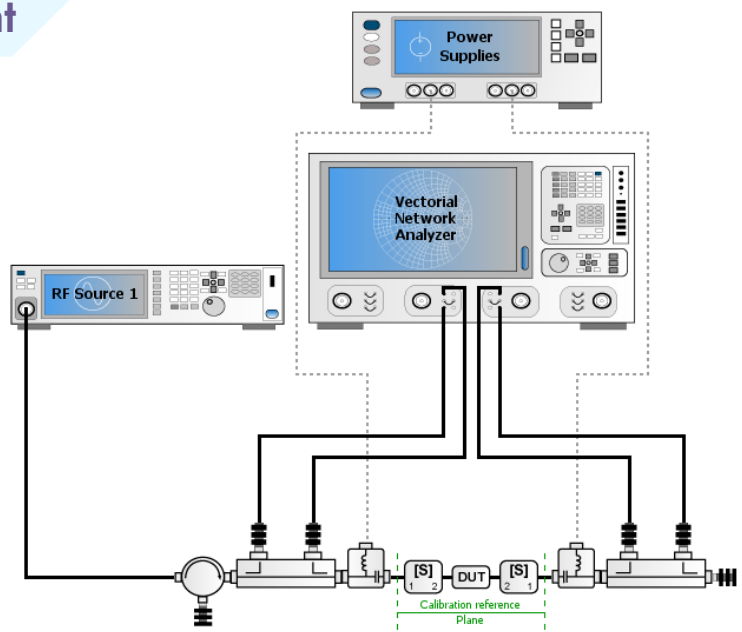
Scalar Measurement



SCHEMATIC-one set-up multi-configuration

The flexibility of the schematic editor allows to build a test set function of the application and available instruments.

Vectorial Measurement



SCHEMATIC-one set-up multi-configuration

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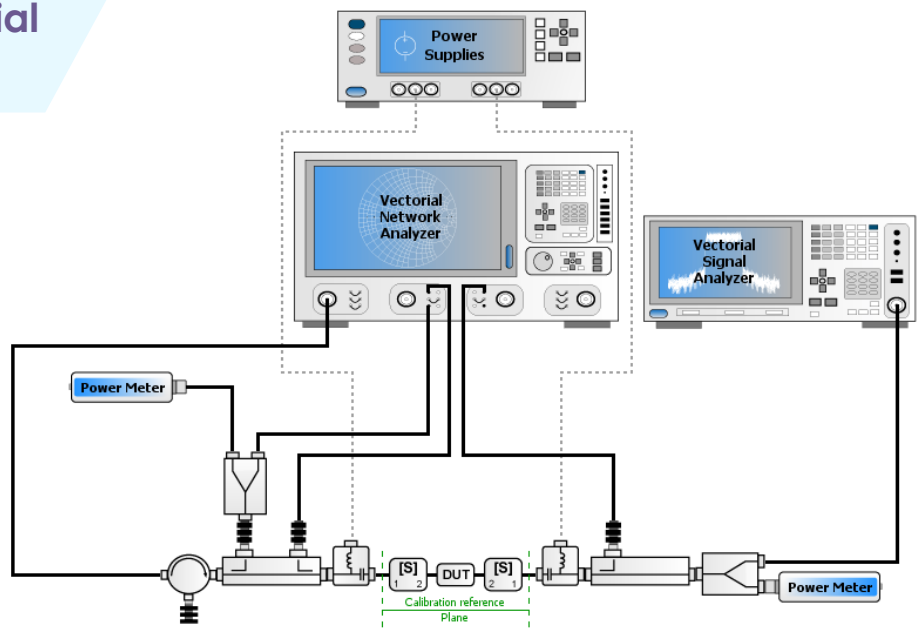
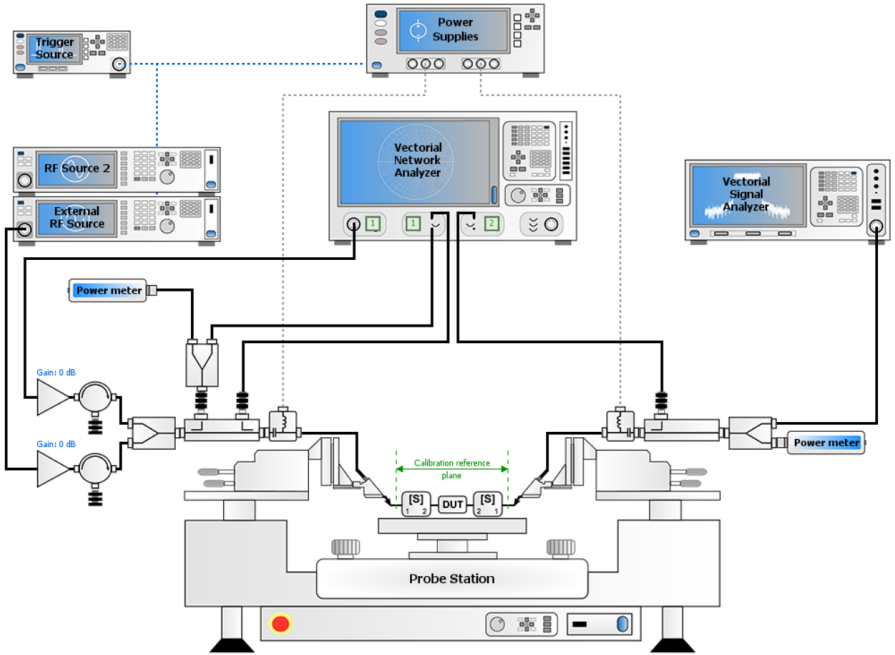
Scalar & Vectorial Measurement



SCHEMATIC-one set-up multi-configuration

The flexibility of the schematic editor allows to build a test set function of the application and available instruments.

On-wafer Measurements



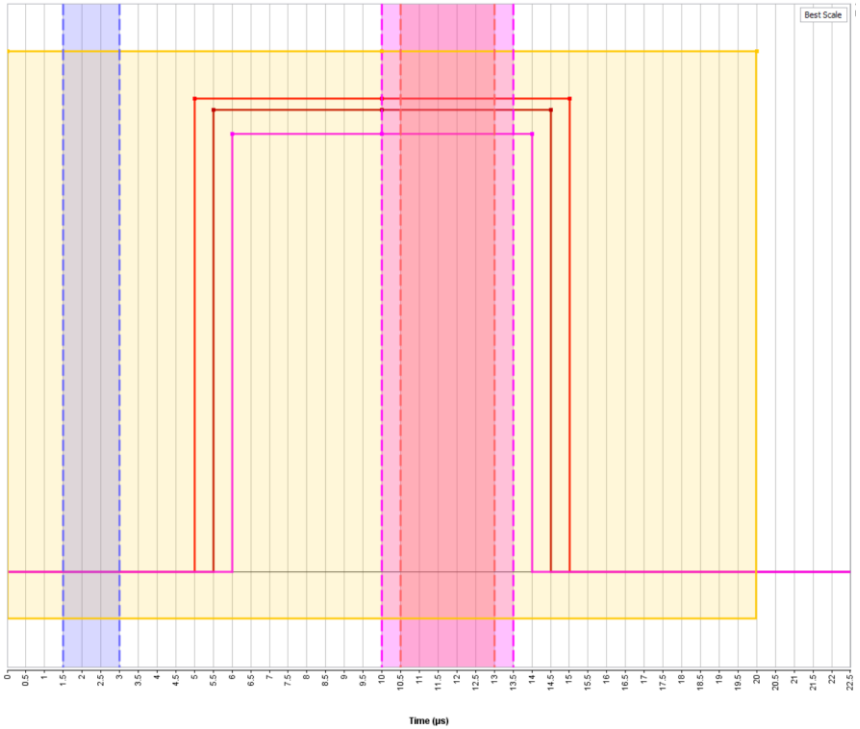
SCHEMATIC-one set-up multi-configuration

Measurement Parameter	SR*[1] Power Sweep	VR*[2] Power Sweep
S-Parameters (S11,S12,S21,S22)	✗	✓
Input Return Loss (IRL)	✗	✓
Available Input Power	✓	✓
Delivered Input Power	✗	✓
Power Gain (Gp)	✗	✓
Transducer Gain (Gt)	✓	✓
Power Added Efficiency (PAE)	✗	✓
Transducer Efficiency (Trans_Eff)	✓	✓
AM/PM	✗	✓
Calibrated Harmonic Power	✗	✓
2-tones Measurements (IMD, VBW …)	✗	✓
Modulated Measurement (ACPR, Output PAPR, CCDF…)	✓ VSG &VSA required	✗

IQSTAR combines advantages of Scalar and Vectorial measurements

CHRONOGRAM-one set-up multi-test signal

Modularity of IQSTAR allows to switch easily from CW to pulsed mode using chronogram editor.



Period: 100.0 µs , PRF: 1.0E-5 MHz

Trace definition: 0.0 µs to 20.0 µs

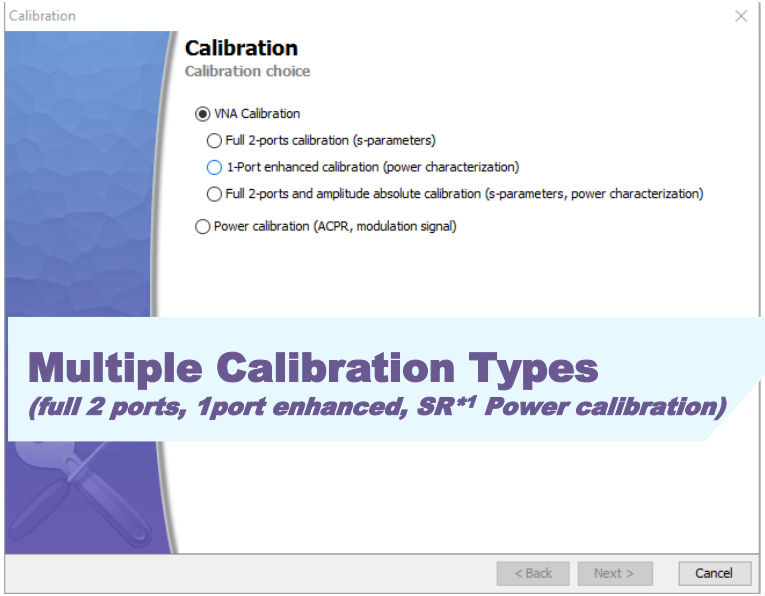
Trace sampling: 101

Hardware	Delay	Width	Pulse End	Unit
Generators				
IV power supplies				
Input	5.0	10.0	15.0	µs
Output	5.5	9.0	14.5	µs
VNA				
Internal RF source	6.0	8.0	14.0	µs
Measurers				
VNA	10.0	3.5	13.5	µs
IV Measurement				
Quiescent	1.5	1.5	3.0	µs
Pulse	10.5	2.5	13.0	µs

IQSTAR sets automatically all triggers in function of your timings setting

CALIBRATION- multi-test signal one calibration

IQSTAR calibration tool is designed to limit the number of connection manipulations and avoid passive S-parameters characterization. The wizard based user interface, helps the users trough the calibration process.

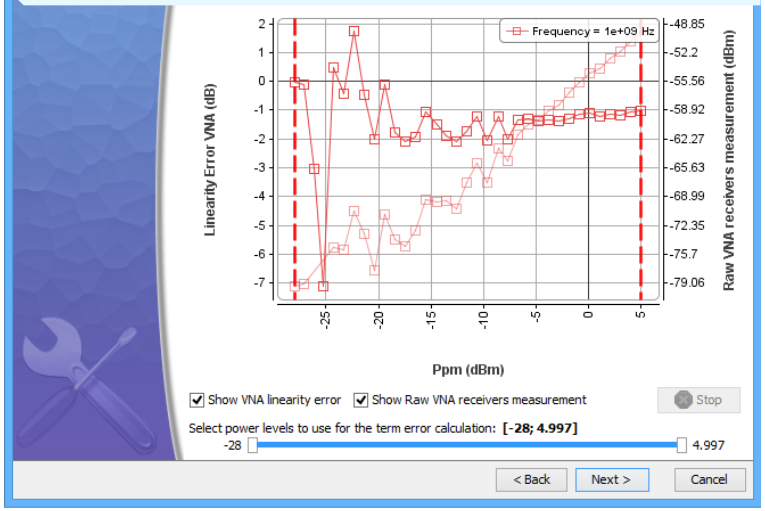


Multiple Calibration Types

(full 2 ports, 1port enhanced, SR*1 Power calibration)

Calibration checking

(Vectorial calibration & Receiver Linearity verification)



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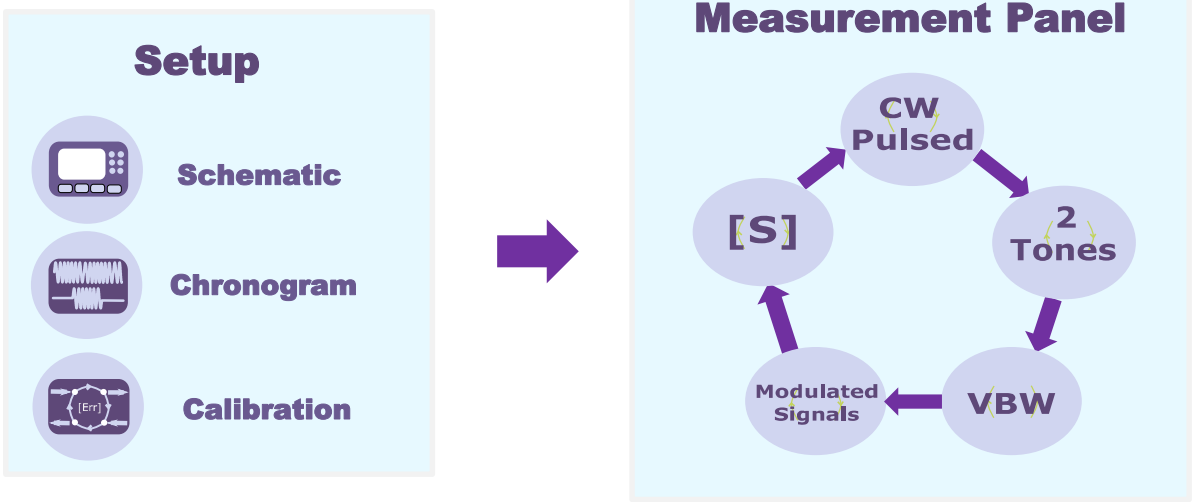
MEASUREMENTS- one setup multiple measurements

Depending on the defined setup and the active calibration, the measurement panel allows to choose different tabs to set and perform S-parameters measurements, power sweeps, frequency sweeps, 2-Tone and video-bandwidth analysis and modulated signal measurements.
An advanced and fully customizable real time visualization tool, embedding measurement history display and tuning target features, allows the user to verify the behavior of the circuit while the measurements are running.



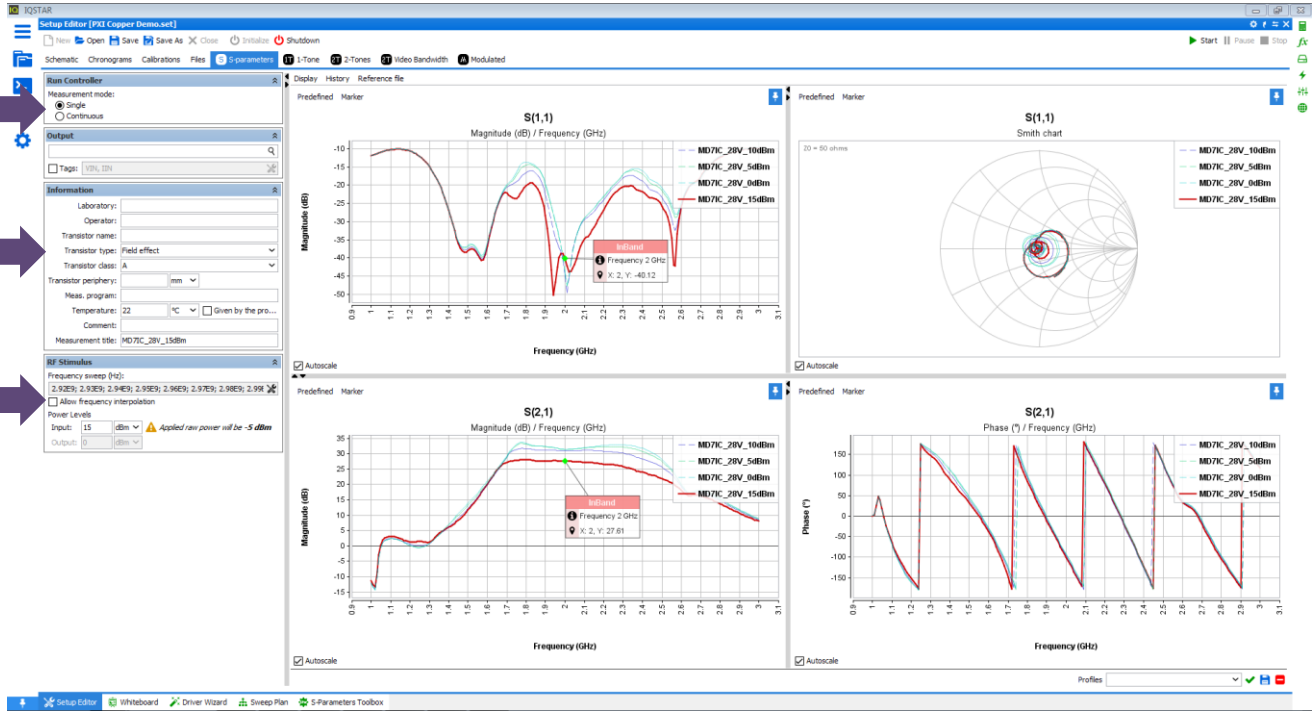
MEASUREMENTS- S-parameters

[S]

Single and Continuous Trigger modes

General Information about the measurements conditions

Frequency sweep and RF Stimulus



Historic display to simplify tuning

Simulation reference file import

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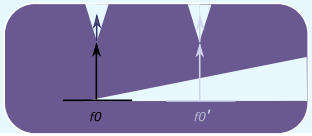
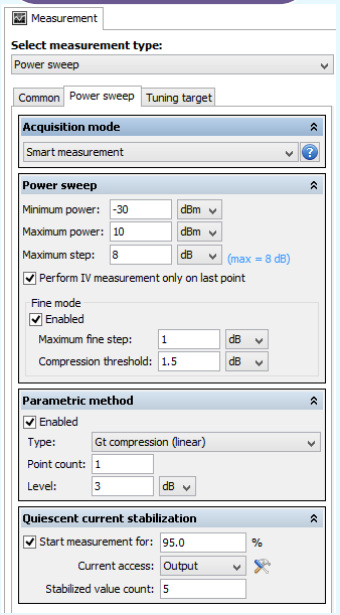
CW Pulsed

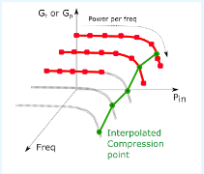
MEASUREMENTS- power sweep



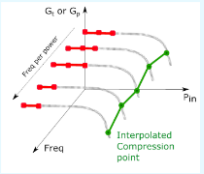


- Center frequency & power sweep
- Power Optimization (Input Power, Output power…)
- Parametric Method to define the frequency visualisation (Gain Compression, Output power …)
- 3 Power sweep Mode:

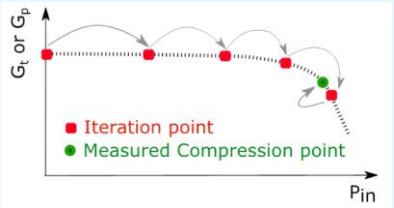
Power per frequency



Frequency per power



Smart Sweep



Smart Sweep :
IFBW= 10kHz
6 freq x 30 Power =180 points in 10'1 s

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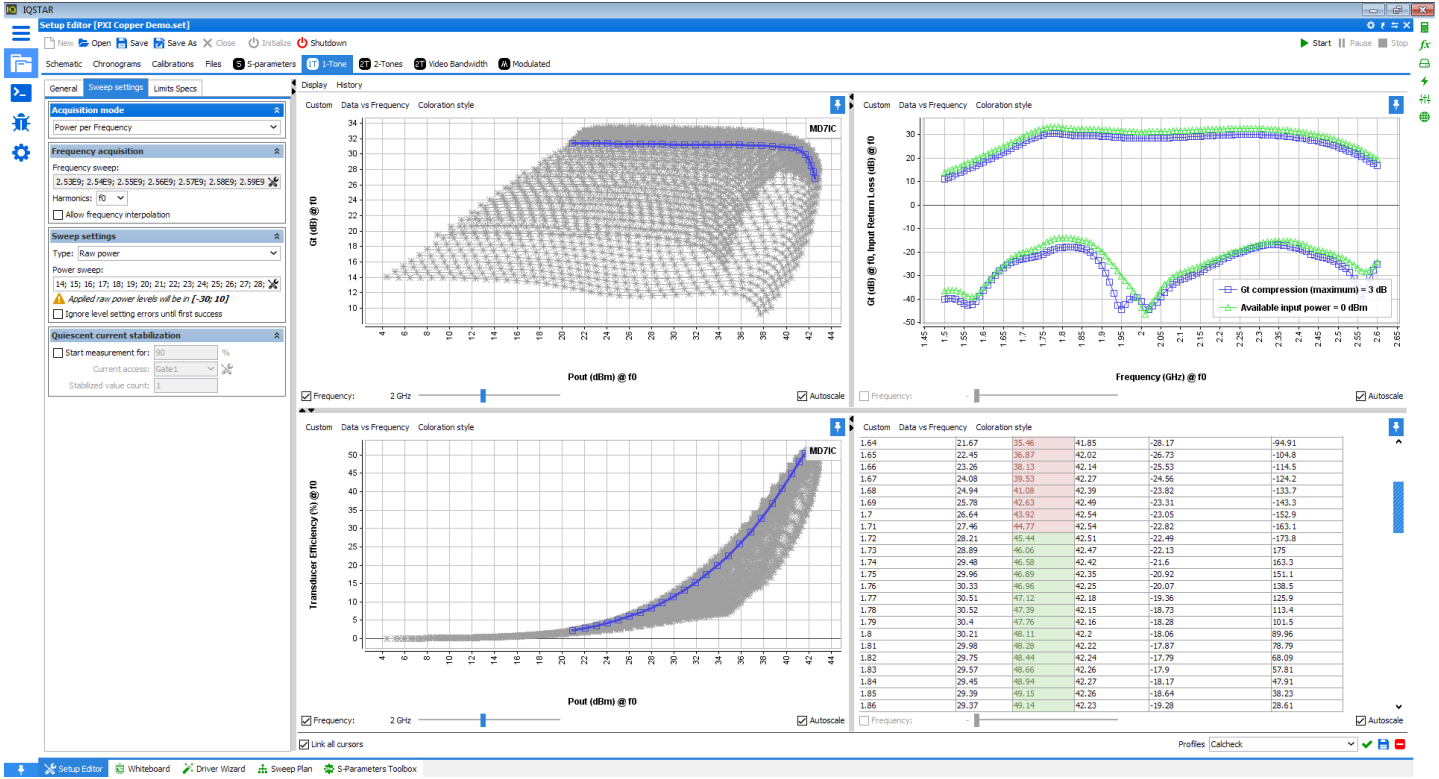
CW Pulsed

MEASUREMENTS- power sweep

Example of Power per Frequency sweep (*Parametric Method = 3dB Gt Compression*)



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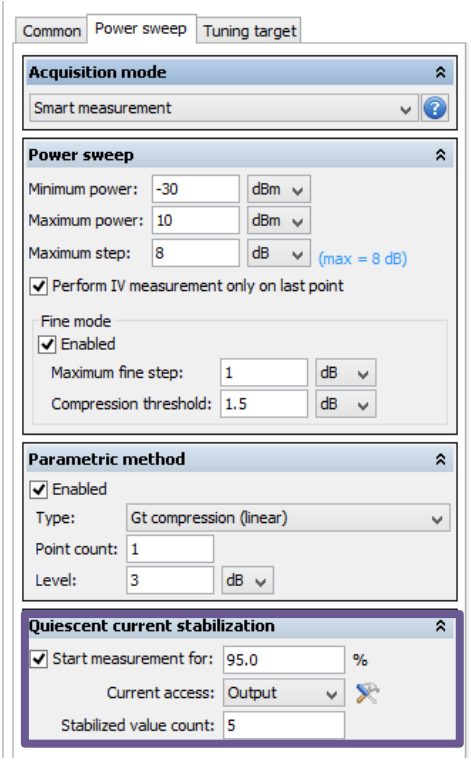
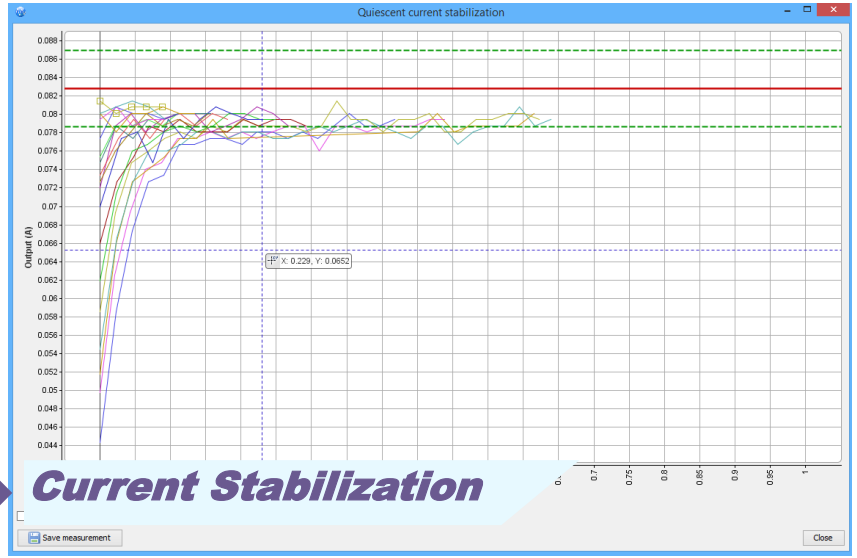
MEASUREMENTS- power sweep

CW Pulsed



IQ.Star includes a customizable current stabilization feature that allows a recovery time between two power sweeps - Very useful for GaN device based circuits presenting trapping phenomena.



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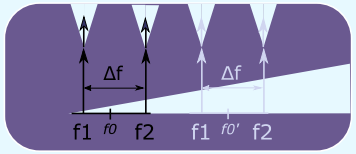
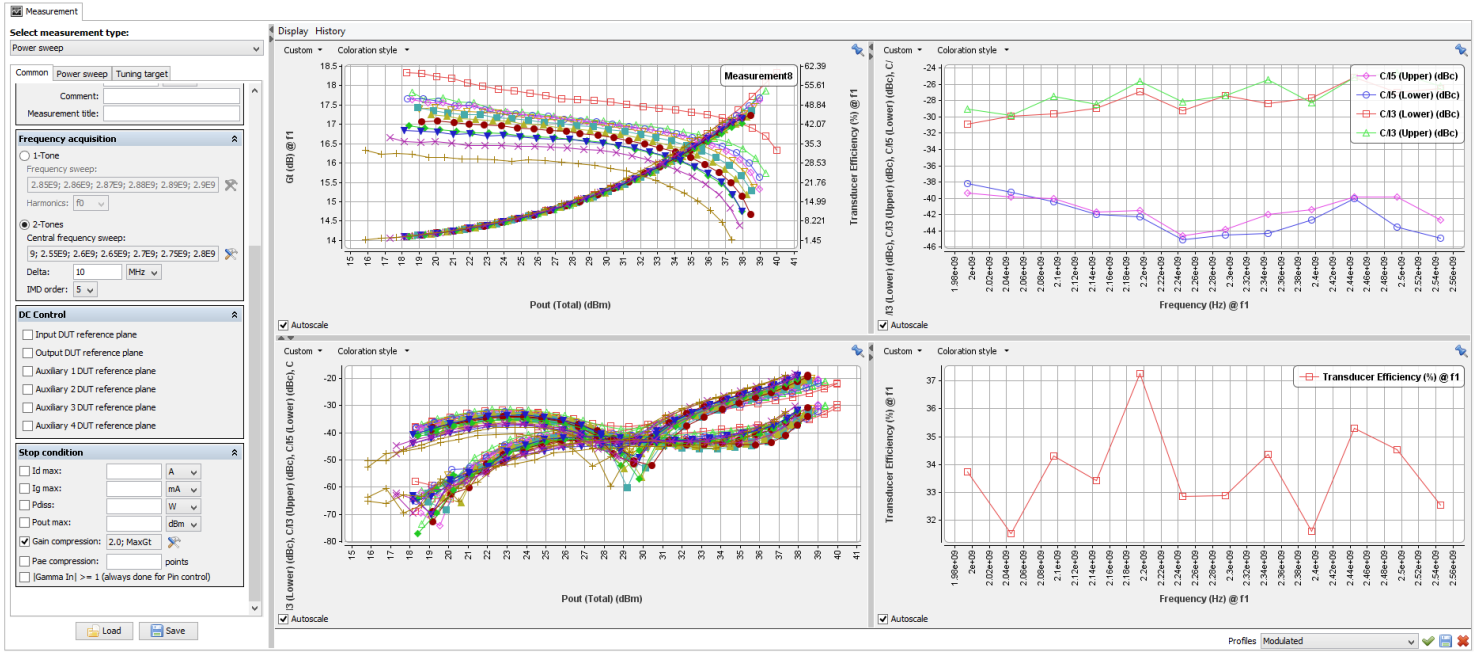
MEASUREMENTS- 2-Tones

2 Tones



- Center frequency & power sweep
- Power Optimization (Input Power, C/I …)
- 2-Tones Balanced Optimization



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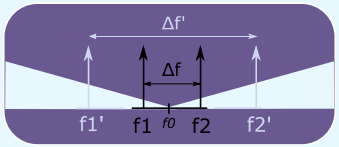
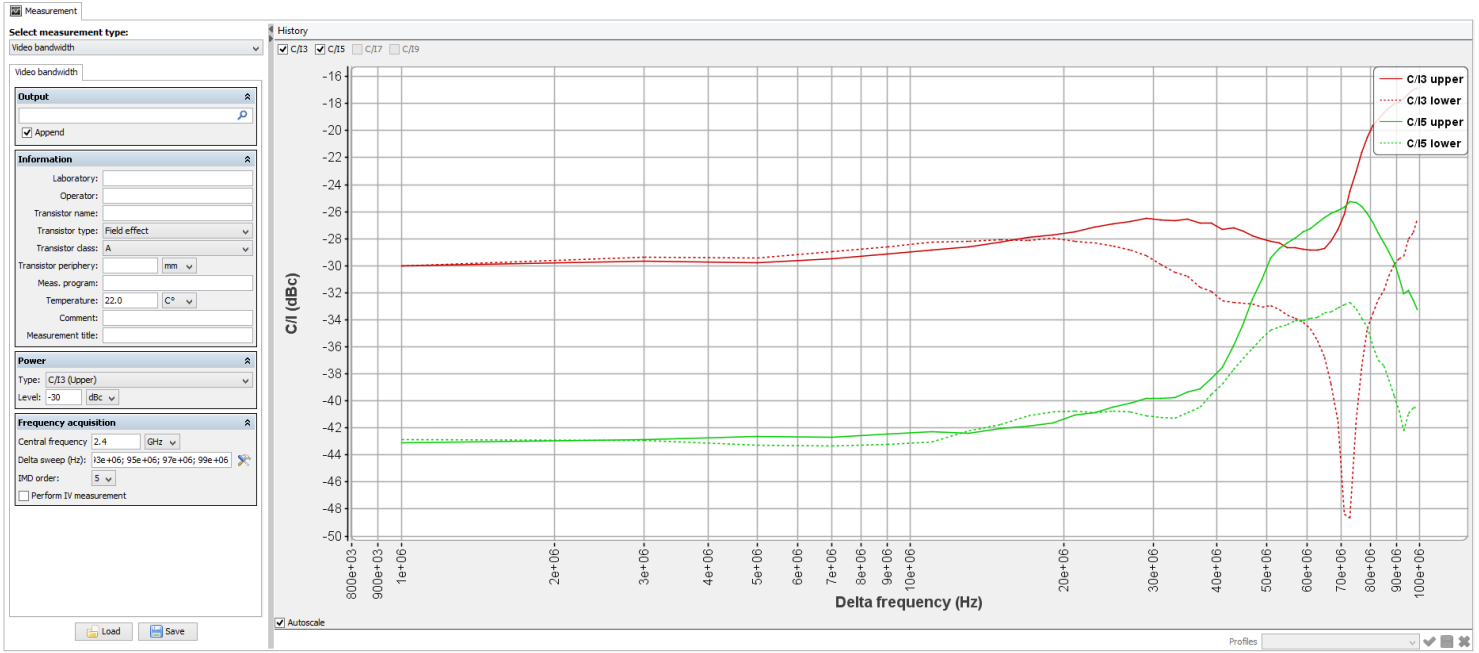
MEASUREMENTS- video bandwidth

VBW



- Delta frequency sweep at constant power
- Power Optimization (Input Power, C/I …)
- 2-Tones Balance Optimization



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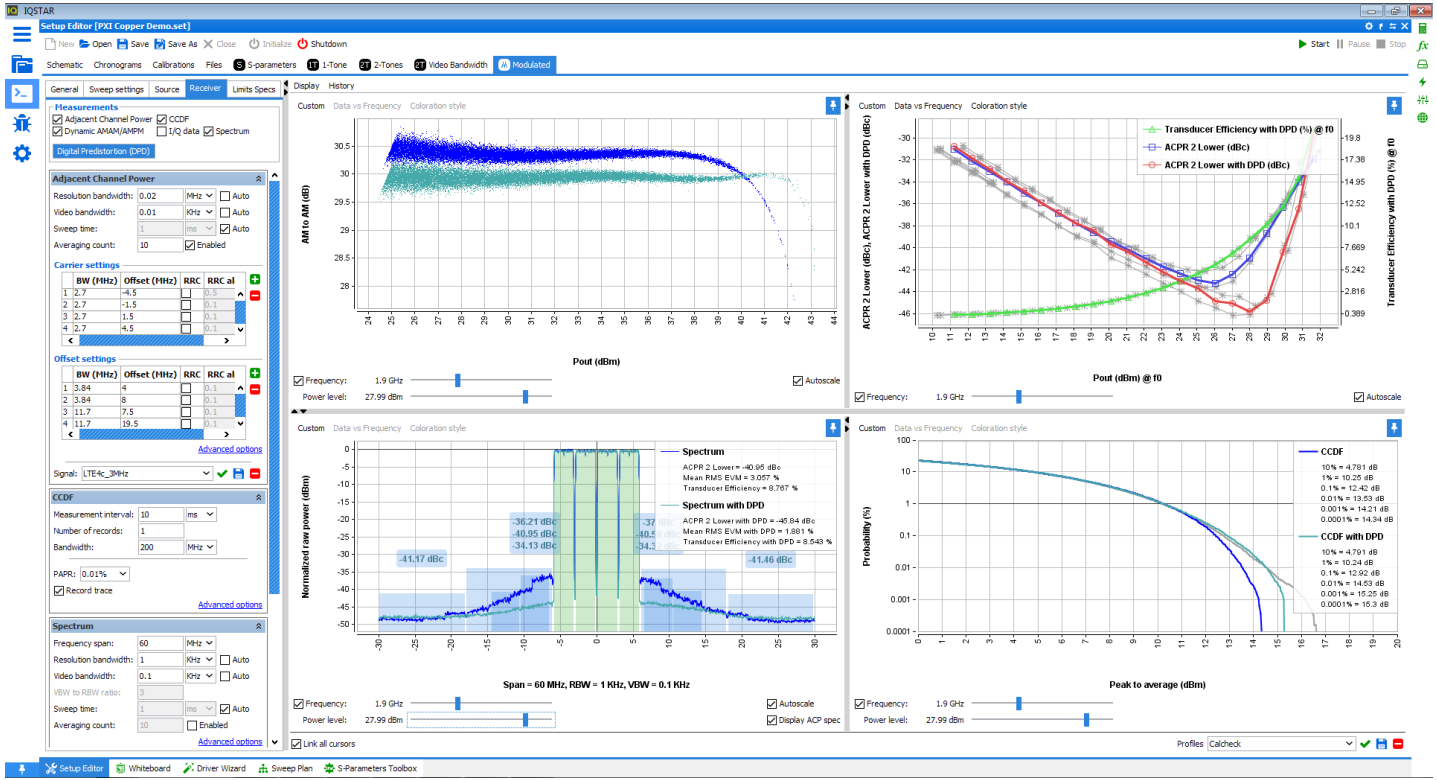
MEASUREMENTS- power sweep

Example of Measurements for Modulated Signal



Measurements sequencer

The Sweep Plan allows to define and customize an automated test flow (DUT biasing sweep, temperature sweep …)

Multi- Setup

DC Control

Loops

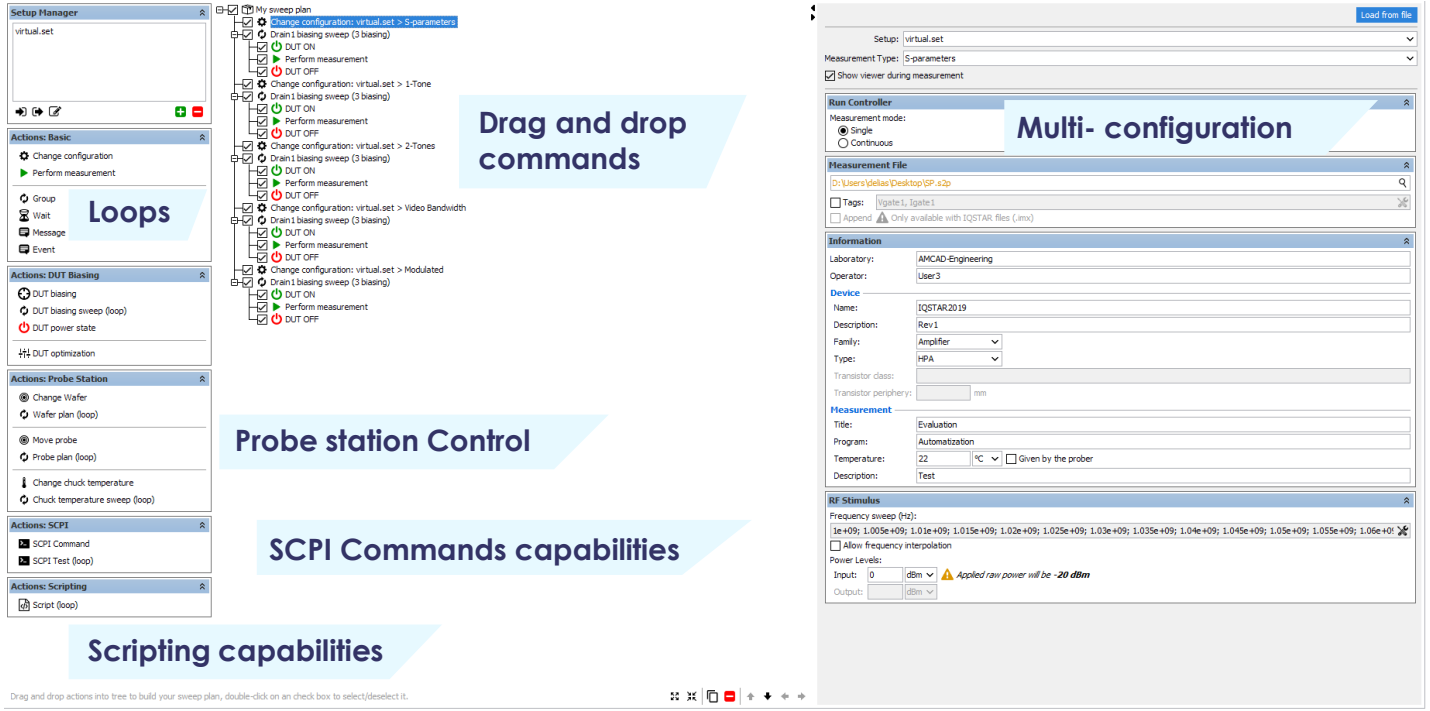
Drag and drop commands

Probe station Control

SCPI Commands capabilities

Scripting capabilities

Multi- configuration



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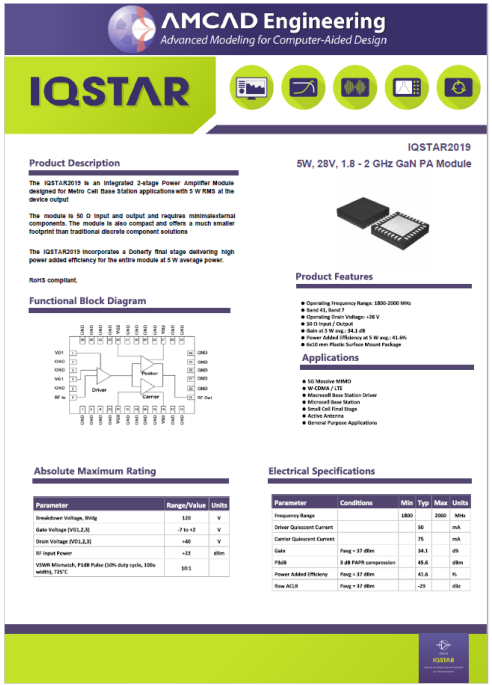
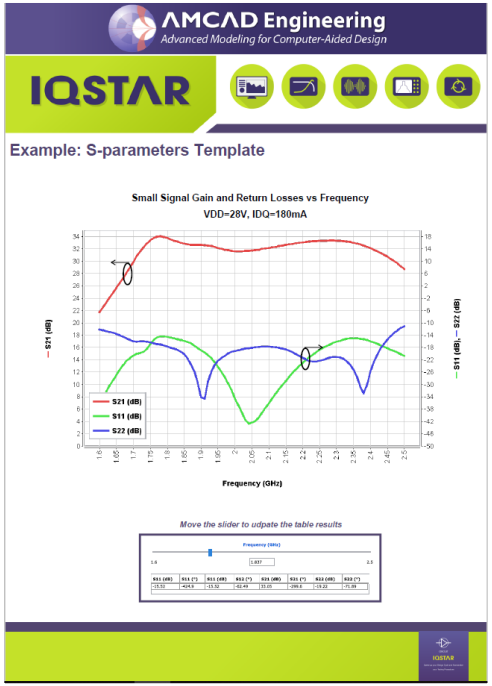
VISUALISATION

IQSTAR Whiteboard visualisation tool allows to configure a fully customizable data display (3D, Slider, Markers, Comments …) in order to present circuit specifications in the format of a datasheet.





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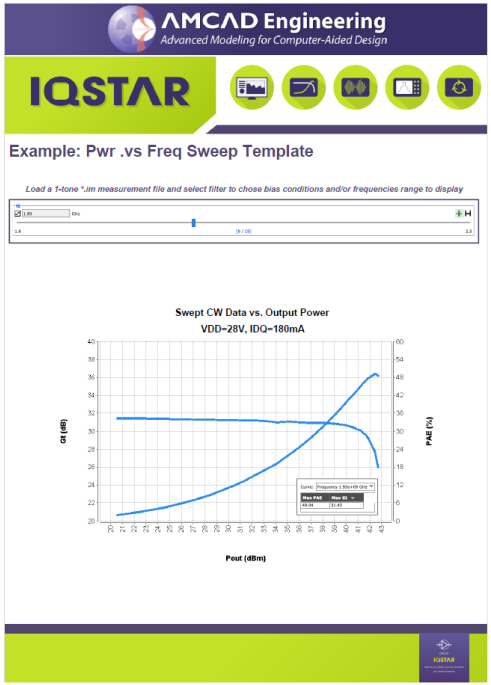

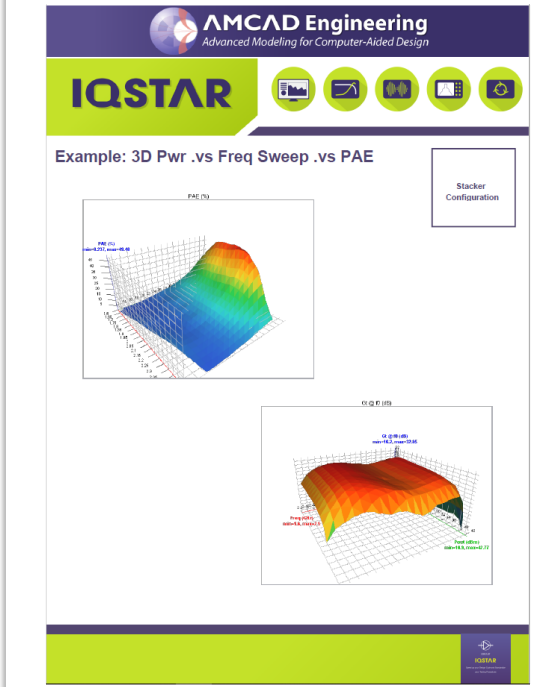

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