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STAN and the STAN Wizard Installation and Use

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STAN and the STAN Wizard

- Installation
- Example Project





- 1: Contact AMCAD Engineering for access to their download site and the IVCAD + STAN installer
- 2: Install IVCAD and STAN
- 3: Establish Hardware ID of your PC (see below) and send code to AMCAD for license file







- 4: When you have received the email from AMCAD save the license file in some convenient location.
- 5: Apply the license file using the License replacement process







 Run IVCAD and check out the Script Server settings

soungs 🛛	IVCAD				_ _ ×		
E E	ile Tools Views Help						
	Plug-ins	*-0×	📜 Script server		* D ×		
	Plug-Ins		Server port (1024-65535):	49,900 🔹			
			Evaluation timeout (in ms, zero for none):	60000			
	Script server		Input termination (which delimits each received expression):	Windows (CR+LF) , pattern:			
			Output termination (added after response):	Vindows (CR+LF) , pattern:			
			Charset used by the server.	130-0039-1			
			Allow user interfaces, can reduce host system resources	i if many windows are created by clients			
			Allow user interactions (message boxes, etc.), NOT REC	OMMENDED IF YOU ACCESS TO THIS SERVER FROM	AN OTHER COMPUTER WITHOUT REMOTE AC		
Server port (1024-65535):		49,900 ≑	en application is startin	g			
Evaluation timeout (in ms, zero fo	or none):	60000					
Input termination (which delimits	each received expression):	Windows (CR+LF)	•				
Output termination (added after	response):	Windows (CR +LF)	Windows (CR +LF)				
Charset used by the server:		ISO-8859-1	•				
Allow user interfaces, can re	duce host system resources	if many windows are	e created by clients				
Allow user interactions (mess	sage boxes, etc.), NOT REC	OMMENDED IF YOU	ACCESS TO THIS SEF				
Shared parser (all clients will	share the same parsing env	ronment)					
✓ Automatically start the serve	er when application is starting	2					
		29 26 29 26	Apply settings		Start server Stop server		
	Plug-ins, Opened plug-ins						
0	pened datasources: 0, selected curves: 0				🌸 42.05 MB / 494.93 MB		
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- Load the example project "STAN_GaAs_MMIC Start.emp"
- Use this project to simply test the interface between the STAN Wizard and STAN
- Run the STAN Wizard and check that the settings defined in the Wizard window are the same as seen in the STAN information window shown on the previous slide
- To see the STAN Wizard settings please click on the Show Secondary button

Lisel ocalServer		Reset Defaults
IVCADPath	C:\Program Files (x86)\Maury Microwave\IVCA	Deset Cale at a
IVCADPort	49900	Reset Selected
OutputTerm	Windows (CR+LF)	
Timeout	10	
	-	
		Hide Secondary





- The process of ensuring that the STAN Wizard and STAN are communicating correctly only needs to be completed once during the installation process
- If there are problems running the STAN Wizard and STAN, please send screen shots of the settings windows to AWR and/or AMCAD Engineering support.



- Run MWO and load the example project "STAN_GaAs_MMIC Start.emp"
- This project uses two PDKs. AWR_MESFET and AWR_Module
- These are loaded from "C:\Program Files (x86)\AWR\AWRDE\13\Library\example_pdks"
- If these PDKs have not been loaded, you will be prompted to load them
- When a project has loaded a PDK, this process does not need to be repeated





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- In the project there are two main schematics
 - MMIC PowerSweep
 - This is used for a frequency / power sweep to understand the compression process that this amplifier exhibits
 - NL Stability
 - This schematic is used for the STAN analysis and has been set up ready to be used with STAN





- Simulate the project
- Notice the gain hump around 11GHz







- We will run the STAN analysis with the amplifier driven into compression at 11GHz
- A small signal test will be conducted between 1GHz and 10 GHz, this is defined in the STAN Wizard settings ...

Small Signal Test Conditions					
Fstart	1000 MHz				
Fstop	10000 MHz				
Fsteps	10				
SweepType	Linear				





- There are two stability probes that have been added to the example project, here is the first probe visible at the top level of the design.
- Note: The probe has been given the ID Gate_probe. It is advised that the probes should have a name that reflects their location in the circuit hierarchy





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 Stability Probes can be added to the design by either using the elements tab and looking in "MeasDevice"

- Or by using the Add Circuit Elements dialogue. Type
 <CTRL> + <L> and the 'Add Circuit Elements' window opens
- In the search text box type 'pro' etc. and all the probes will be listed. Click on the STAB_PROBE and it will be added to the selected schematic









• The location of the second probe can be found at the drain of each output stage transistor





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 Run the Wizard and select the schematic to be used for NL stability analysis

Circuit schematic			
Select the circuit	schematic for Stabili	ity Analysis:	
NL Stability			•
Schematic is usin [1.1e+010].	g frequencies		
•			•





• Scroll through the settings ...

			Reset Defaults
STAN OPLIONS			
MaxOrder	30	Ξ	Reset Selected
PhaseTolerance	0.1		
Small Signal Test Conditions	5		
Fstart	1000 MHz		
Fstop	10000 MHz	Ŧ	
			Show Secondary





- The amplifier will be driven at several input power levels at a single frequency, already defined in the schematic
- Notice that the STAN Wizard automatically reads the PORT_PS1 settings for power and frequency

Trequences U U Ue project defaults Current Range 1 1 1 points	Modify Range Start (GHz) Single point Stop (GHz) Add ○ Delete Step (GHz) @ Replace Apply Sweep Type Data Entry Units @ Linear GHz ♀	Z=50 Ohm PStart=10 dBm PStop=18 dBm PStep=1 dB		
Decie Section	OK Cancel Help	Port	PORT_PS1.P1	*
		AnalysisType	Nonlinear	
		Pstart	10 dBm	
NL Stability	Ŧ	Pstop	18 dBm	=
Cohana lia ia unian fan		Pstep	1 dB	
Schematic is using the	quencies	Large Signal Freque	ncies	Ŧ



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• When the STAN Wizard (and the associated schematics) have been set up correctly, then click the finish button.



- The Wizard will now simulate the circuit and pass the results to STAN.
- When STAN has conducted a Pole Zero analysis of the circuit under test the results will be sent back to MWO and pole zero graphs will be created





- There will 9 Pole Zero plots.
- One for the gate of the top transistor and one for each of the 8 output devices.
 - MMIC Power Gain ML Stability_STAN_RESULTS_NONLIN_S3_S1_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S2_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S3_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S4_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S5_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S6_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S6_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S7_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S7_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S8_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S8_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S8_STAB_PROBE_Drain_Probe NL Stability_STAN_RESULTS_NONLIN_S3_S8_STAB_PROBE_Drain_Probe
- Also, there will be a new STAN schematic (NL Stability_STAN) that has been created by the Stability Wizard





- In the new schematic the NLSTABILITY element will have been added
- This schematic can be used to refine the stability analysis and the STAN WIZARD will not need to be used
- Simply edit this schematic and the NLSTABILITY element and then simulate as one would with any project document

-	NLSTABILITY ID=ST1 Fstart=1000 MHz Fend=10000 MHz Fsteps=10 SwpType=LINEAR

arameters	Statistic	s Display	Use	er Attrib	utes	Symbol	Layout	Mod	el Option	s Vector
Name		Value	Unit	Tune	Opt	Limit	Lower I	Jpper	Step	Description
N ID		ST1								Stability control name
B Fstart		1000	MHz						1	Small-signal frequency start
B Fend		10000	MHz							Small-signal frequency end
I Fsteps		10								Number of points in small-signal frequency sweep
SwpType	e	LINEAR							1	Sweep type
UseSTAN	N	Yes							1	Use STAN analysis
STANMA	XORDER	30								Maximum order for STAN analysis
STANPH	ASETOL	0.1								Phase tolerance for STAN analysis
4										
Stability con	trol name	ze Par	t Num	ber						Hide Secondary



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• Set up the gate Pole Zero results to be swept rather than display all the results and then tune on the drive power





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