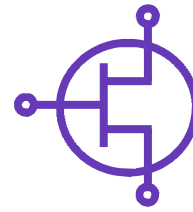


MESFET MODEL

Model Features

- Broadband (DC-40GHz)
- Non-linear (Curtice Cubic model)
- Measurement validations:
 - DC-IV
 - Phase noise
 - Multi bias Noise parameters
 - Multi bias S-Parameters



MWT MWT-7 Low Noise MESFET CHIP

Model Description

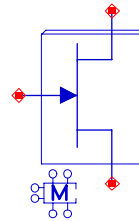
The MESFET MES-MWT-MWT7 is a non-linear model for the MWT MWT-7 MESFET in a chip package based on the extraction of curtice cubic model. The model is intended for use with microstrip applications operating from DC to 40 GHz. The model is designed to work best for non-linear simulations, and the small-signal noise model will be most useful for low and medium noise amplifier design.

This model was enhanced in v8.0 to improve model performance.

Technical Notes

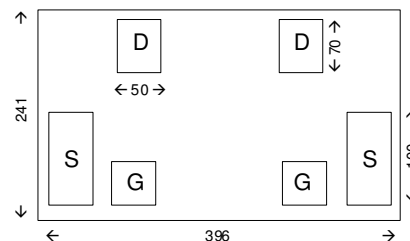
- The nonlinear model is extracted from DC and S-parameter measurements at different bias conditions.
- The non-linear model has been validated with measurements over the frequency range DC to 40 GHz in a common source configuration.
- The model optimal bias point is at Vds of 3 and 5V and Ids of 30 and 50 mA.
- Via effects are included in the model.
- The noise model has been validated with measurements over the frequency range 2 to 26 GHz in a common source configuration.

Model Representation



MES_MWT_MWT7_MDLXNLT1
MDLX_MES1
Model_Mode=0
BWRemove=0

Test Layout

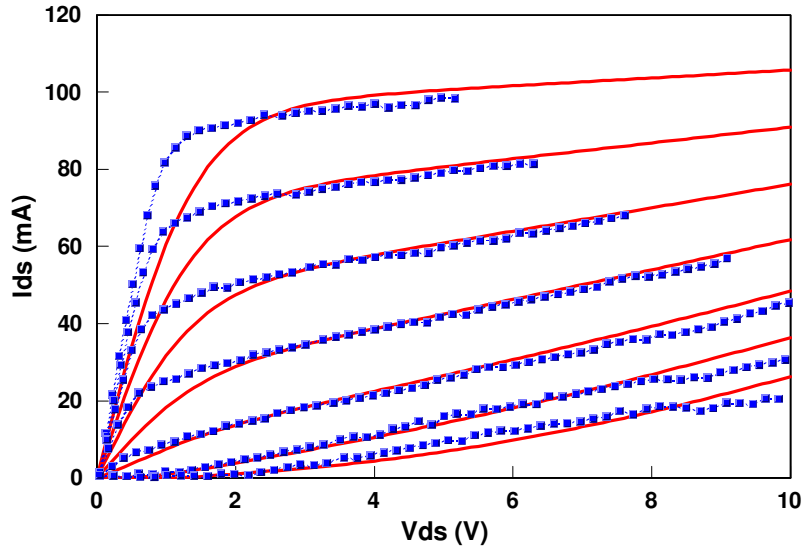


Bond wire layout of MWT-7 chip

Dimensions in mils



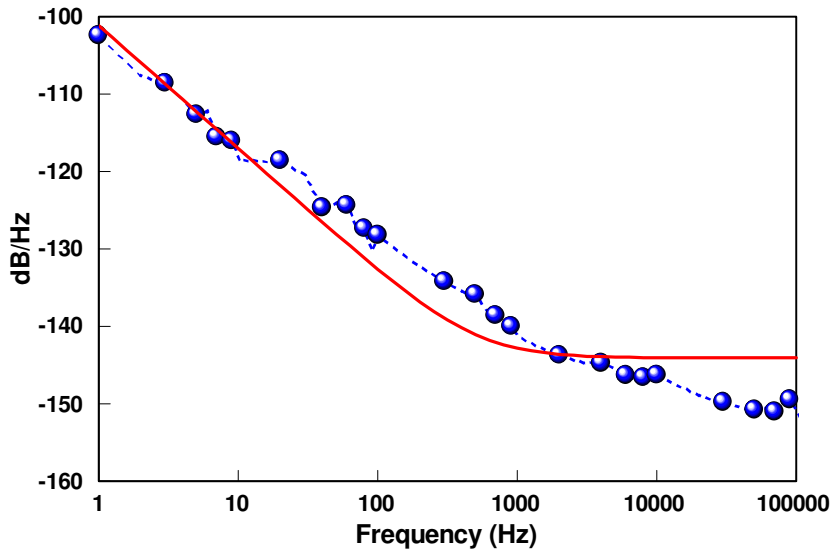
DC IV Characteristics



Legend: Solid Red lines-Model, Dashed lines with Blue ■ markers-Measured data

Simulated at T=25C with VGS varying from -2.2 to 0.2V in steps of 0.4V

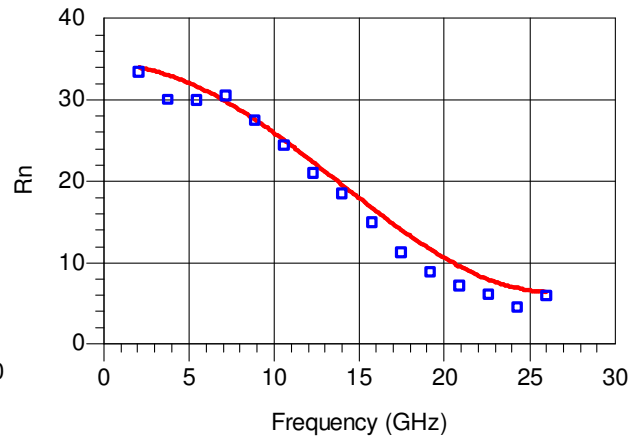
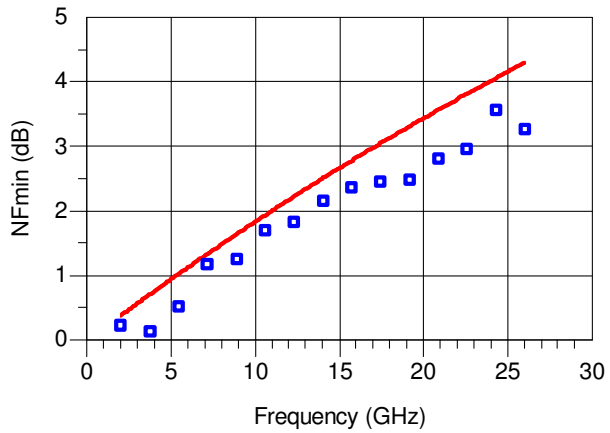
1/f Phase Noise



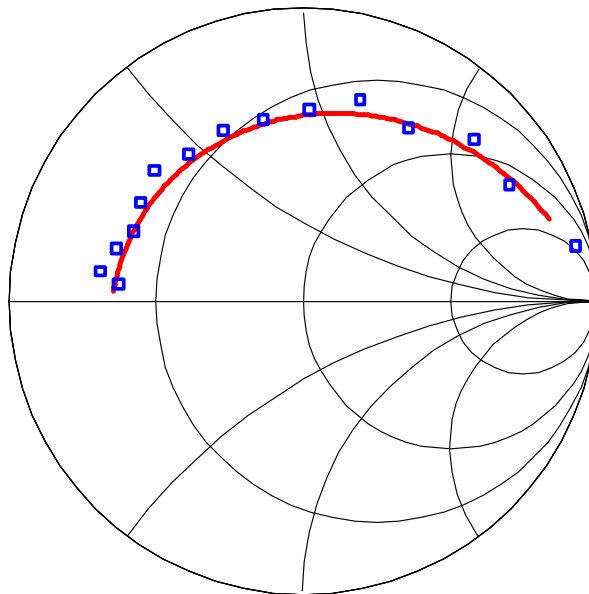
Legend: Solid Red lines- Model, Dashed lines with Blue ● markers- Measured data

Simulated at VDS=4V and IDS= 50mA

Noise Performance



Gamma_opt



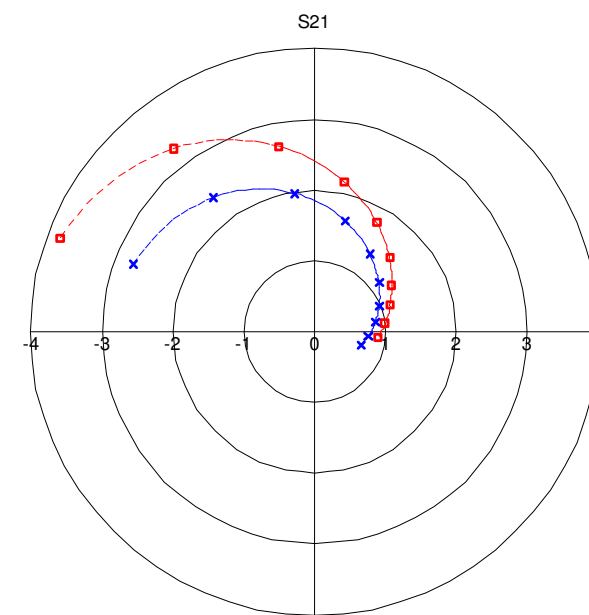
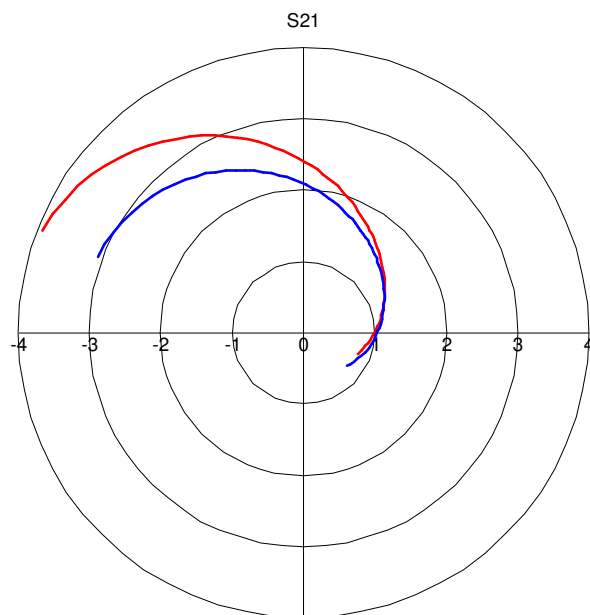
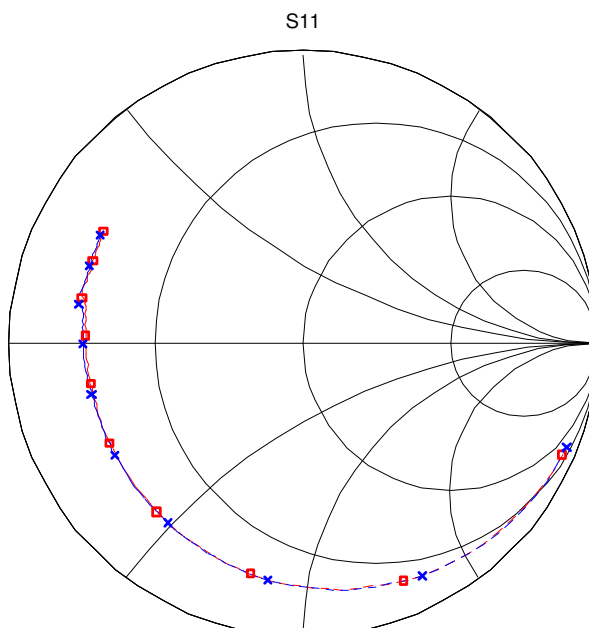
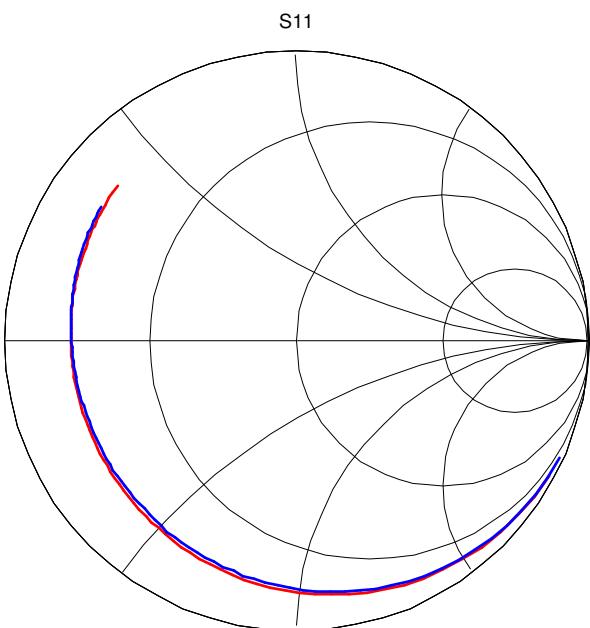
Legend: Solid Red lines-Model , Blue \square Markers- Measured data

Simulated at VDS=3V and IDS=30mA
Frequency range: 2 to 26 GHz

Bias Dependence

Modeled

Measured

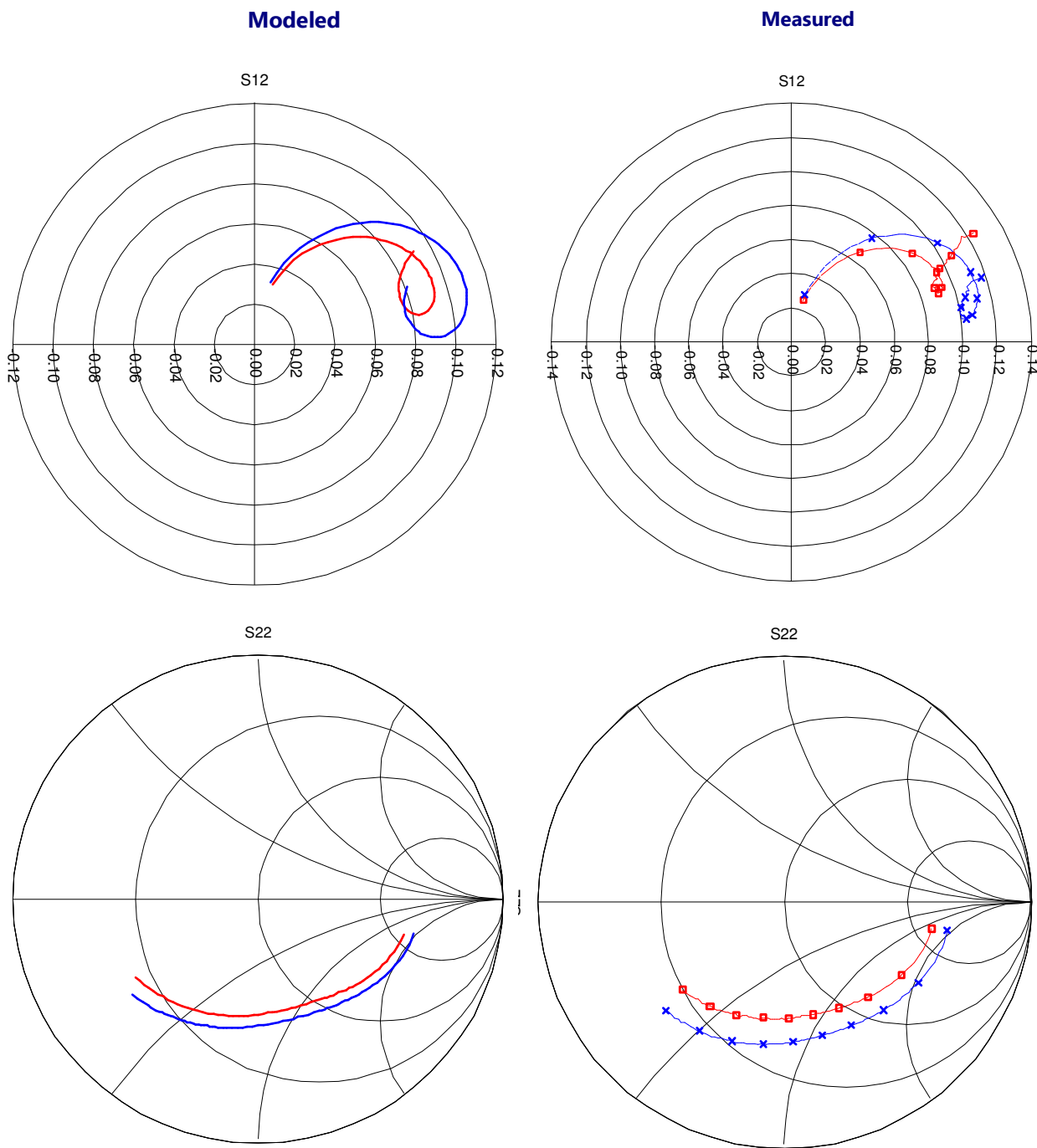


Legend: Solid lines– model, Dashed lines with markers– Measured data
■ - 50mA at 3V, × - 30mA at 5V

Model and measured S11 and S21 at VDS=3V and 5V
 Frequency range is 2 to 40 GHz.



Bias Dependence



Legend: Solid lines– model, Dashed lines with markers– Measured data
 □ - 50mA at 3V , X- 30mA at 5V

Model and measured S11 and S21 at VDS=3V and 5V
 Frequency range is 2 to 40 GHz.

