

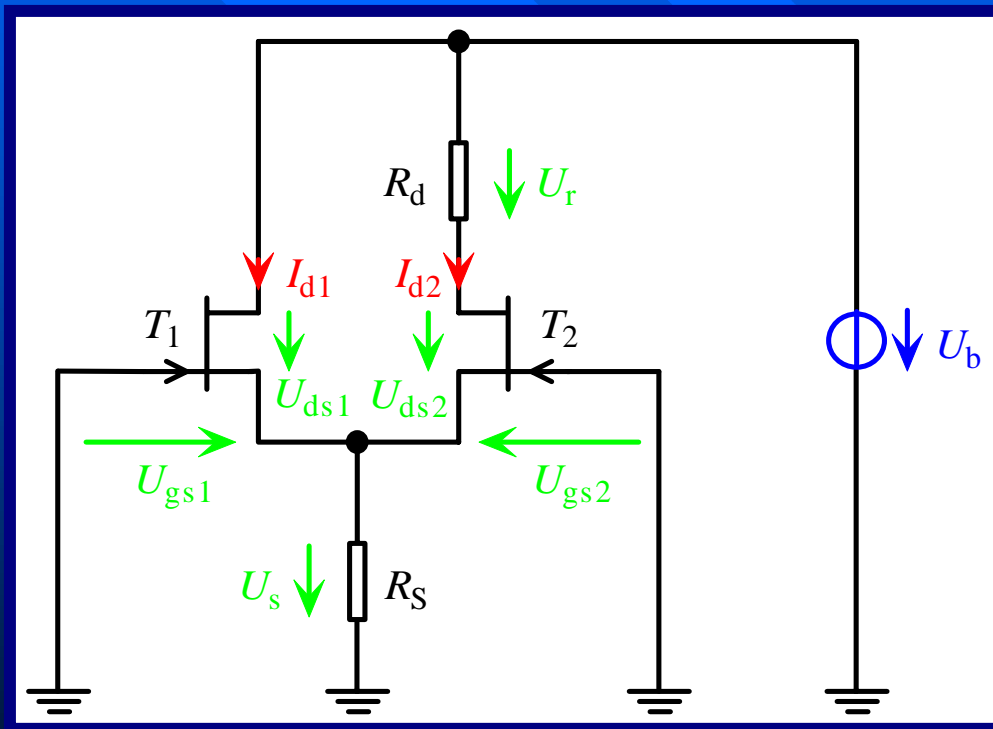
A Novel Non-Linear Measurement Using Small Signal Technique

by

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Context of the Galvanic Quantities

Source Coupled JFETs



$$U_s = R_S (I_{d1} + I_{d2})$$

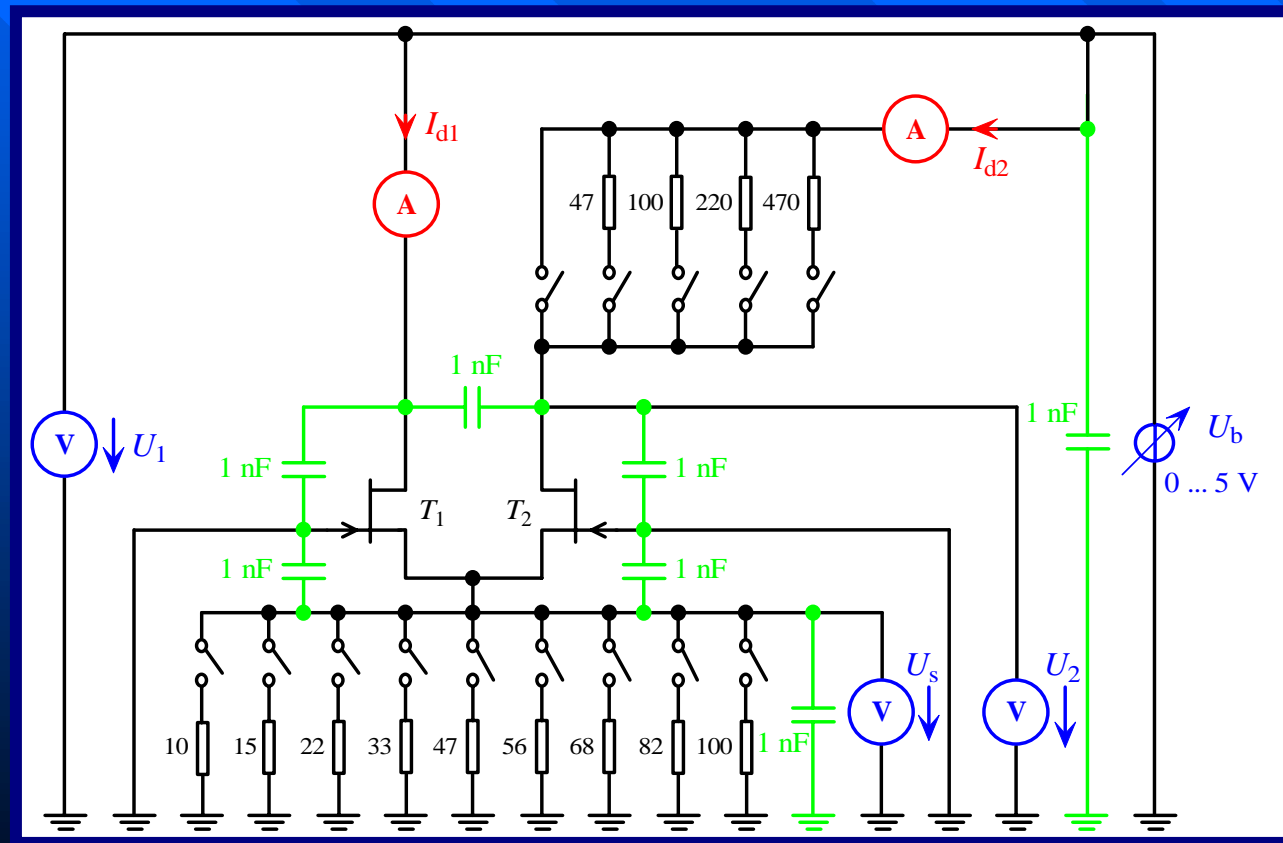
$$U_{gs1} = U_{gs2} = -U_s$$

$$U_{ds1} = U_b - R_S (I_{d1} + I_{d2})$$

$$U_{ds2} = U_b - R_S (I_{d1} + I_{d2}) - R_d I_{d2}$$

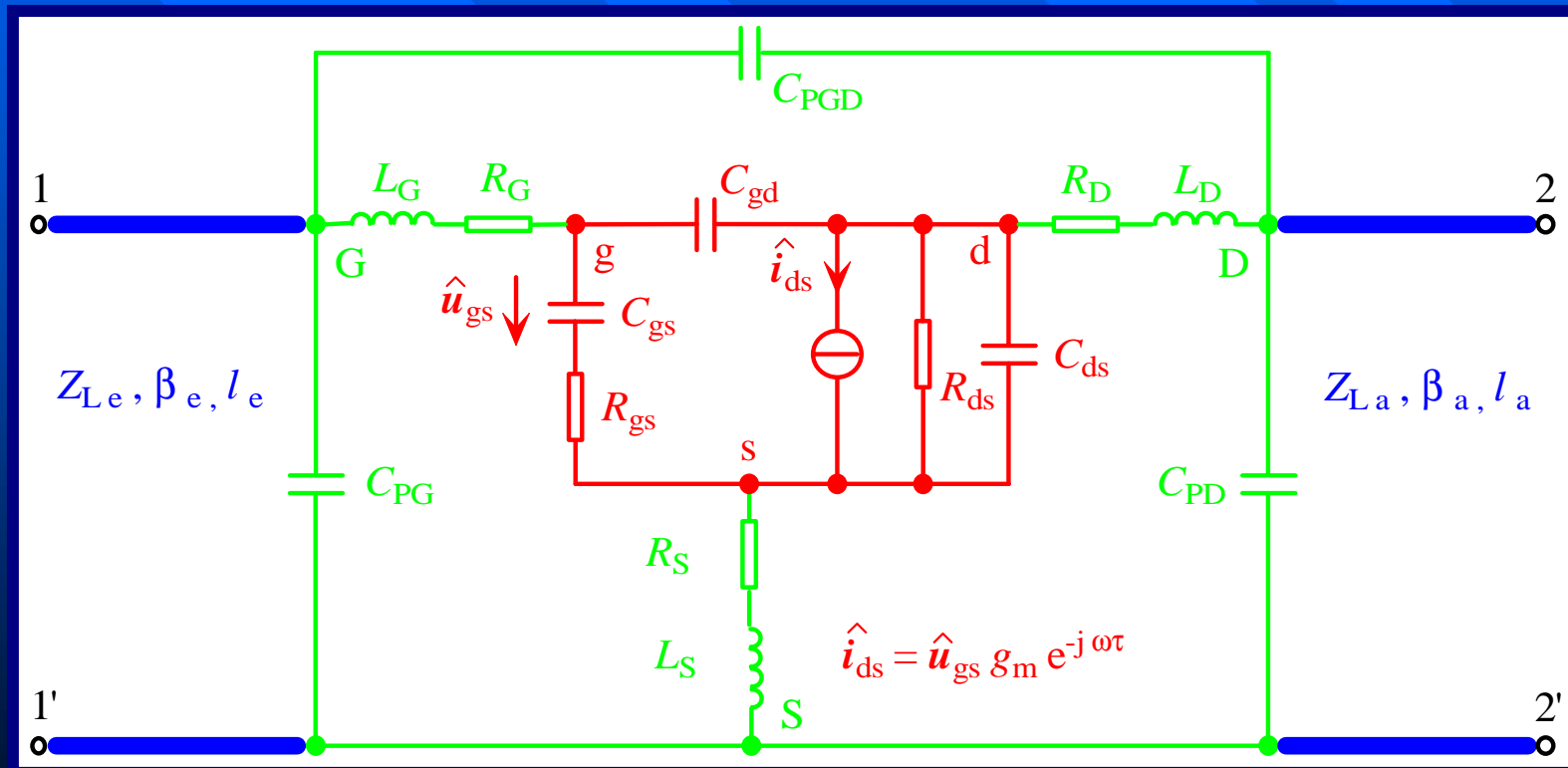
Context of the Galvanic Quantities

Measurement of the Relevant Values



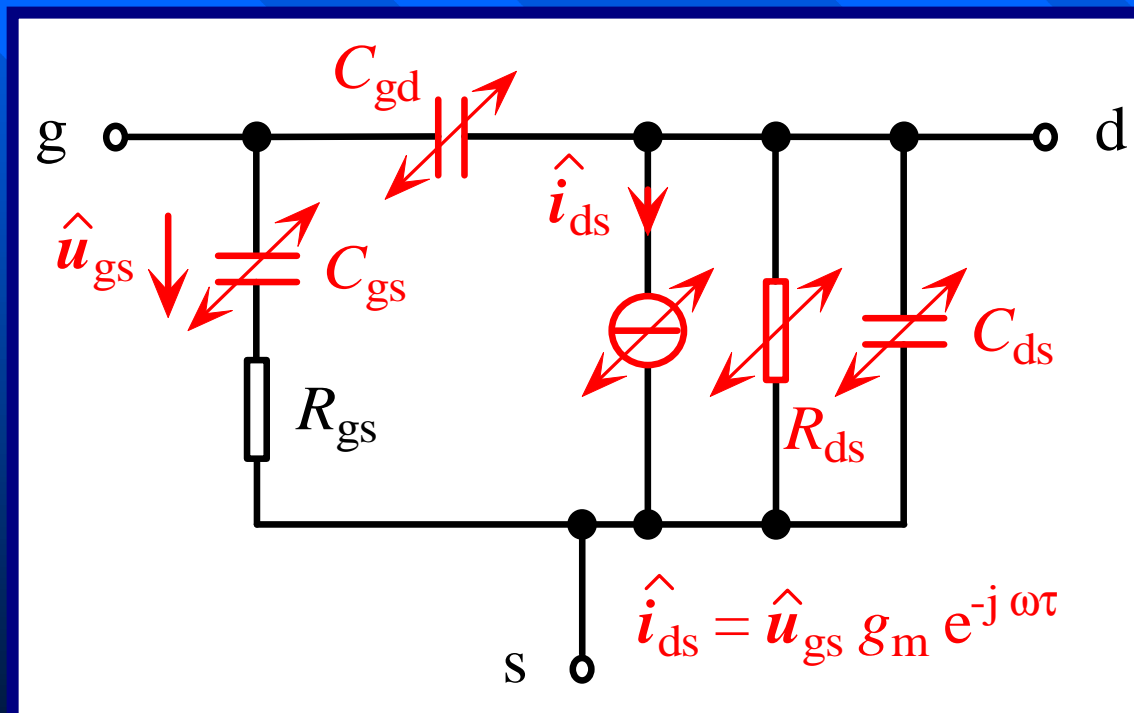
Modelling of the JFET

Small Signal Equivalent Circuit of a JFET



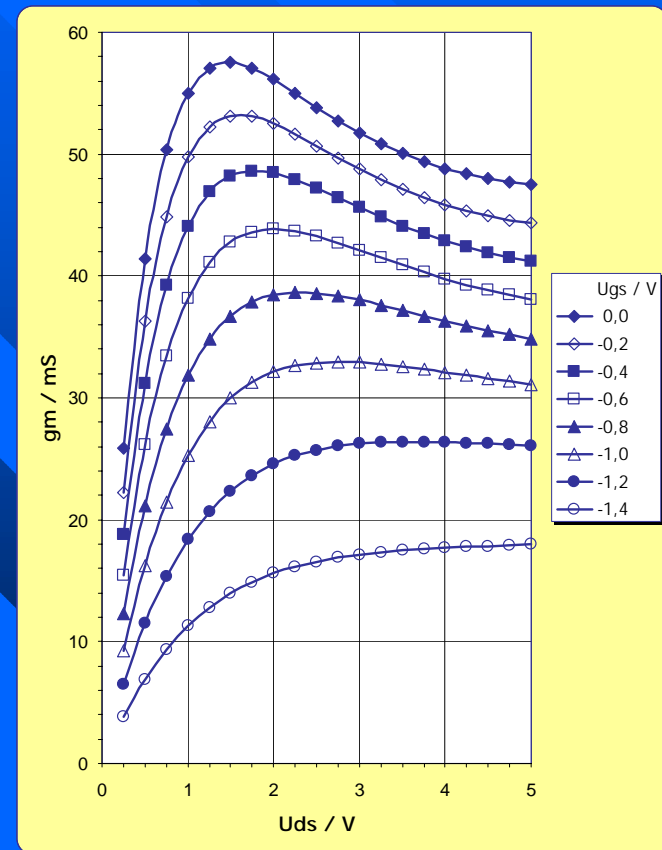
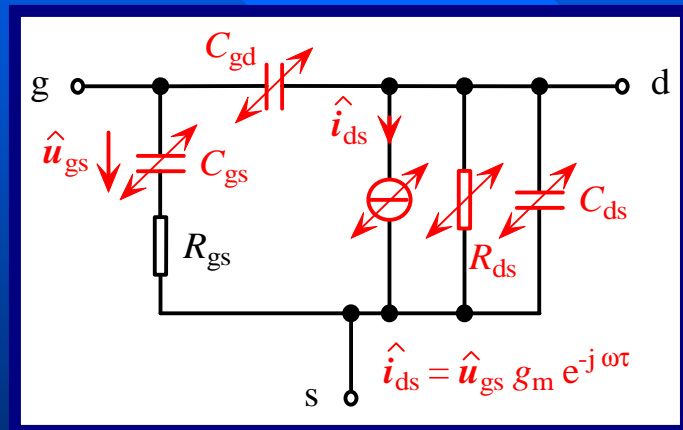
Modelling of the JFET

Nonlinear Intrinsic Equivalent Circuit



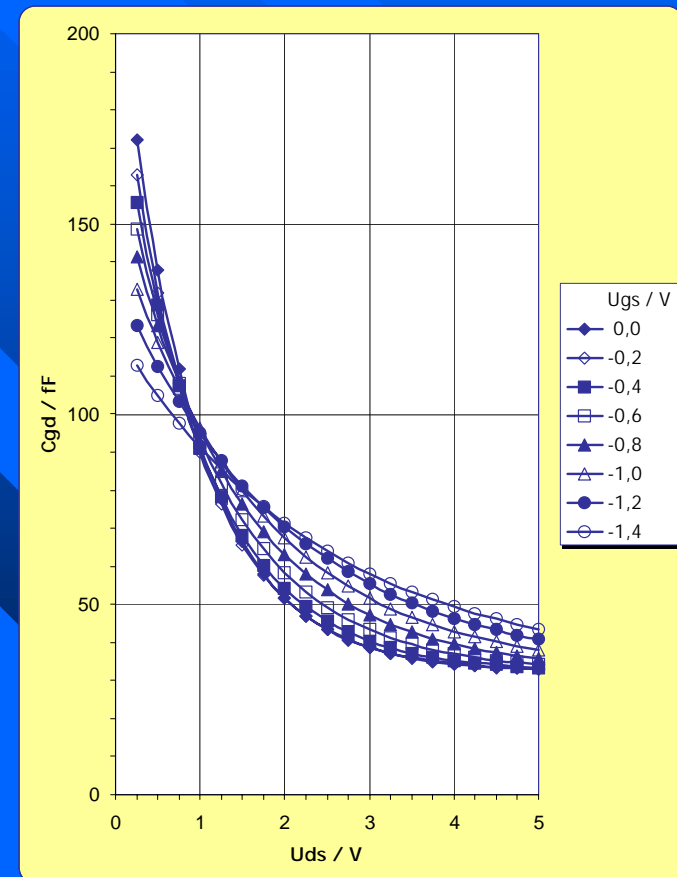
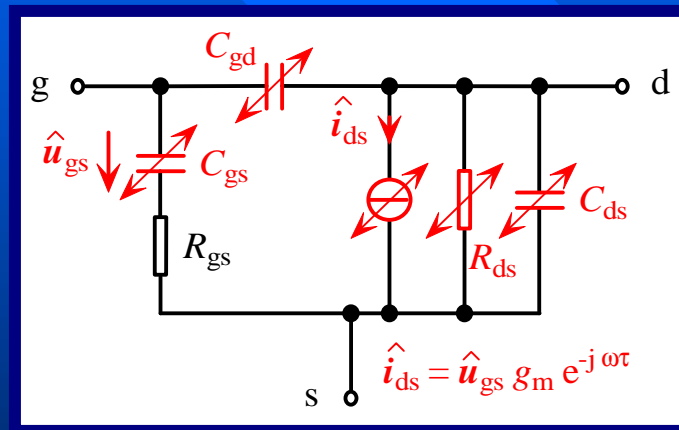
Modelling of the JFET

Mutual Conductance



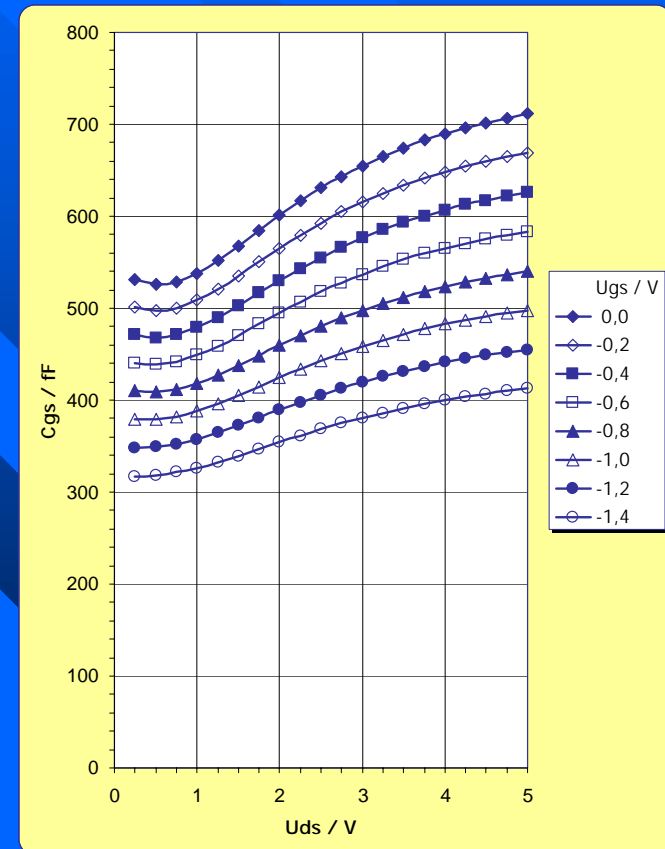
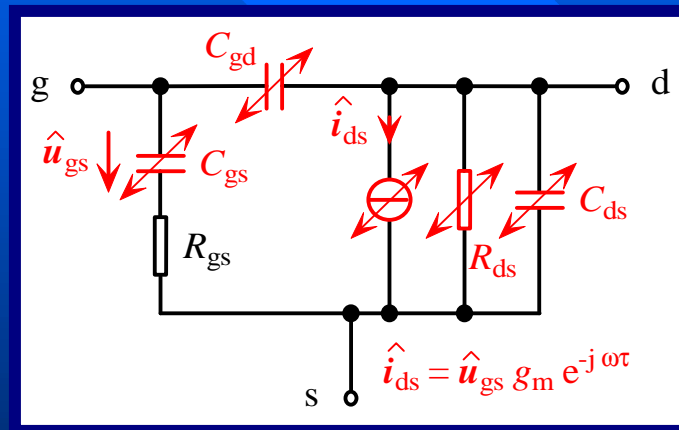
Modelling of the JFET

Gate-Drain-Capacitor



Modelling of the JFET

Gate-Source-Capacitor



Conclusion

The voltage dependent intrinsic JFET equivalent circuit elements are determined by

- measuring the relevant galvanic quantities at a large number of possible operating points and
- measuring the small signal s-parameters at these operating points and
- calculating the voltage independent and the voltage dependent equivalent circuit elements.