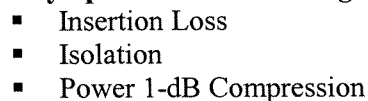


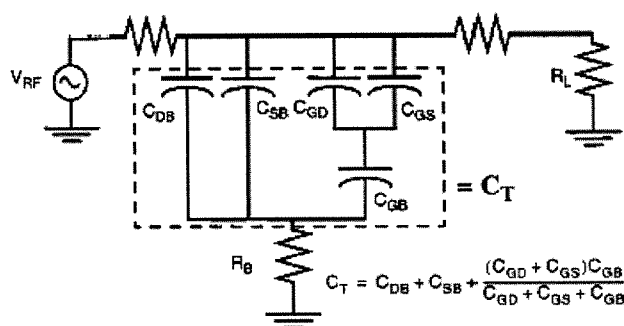
Introduction: RF switches are need for signal path manipulation in wireless systems CMOS based technology may prove to be more competitive than GaAs FETs or PIN diode based switches as CMOS offers high level of integration and cheap fabrication process.

Key Specifications Investigated:



- ON-state resistance
- Substrate resistance
- Transistor width
- Transistor bias

Equations:



$$IL = \frac{\text{Power Available from Source}}{\text{Power Delivered to Load}}$$

$$IL = \frac{1}{|S_{21}|^2} = \frac{(R_{ON} + 2Z_0)^2 + \omega^2 C_T^2 [(R_{ON} + 2Z_0)R_B + (R_{ON} + Z_0)Z_0]^2}{(2Z_0)^2 (1 + \omega^2 C_T R_B)}$$

$$R_{B(MA)} = \frac{-\omega^2 C_T^2 (R_{ON} Z_0 + Z_0^2) + \sqrt{\omega^4 C_T^4 (R_{ON} Z_0 + Z_0^2)^2 + 4\omega^2 C_T^2 (R_{ON} + 2Z_0)^2}}{2\omega^2 C_T^2 (R_{ON} + 2Z_0)}$$

Results and Conclusion

The switch exhibited 07-dB IL, 17-dB P_{1dB} , and 42-dB isolation at 928 MHz which is comparable to GaAs switches.

Low insertion loss is achieved by optimizing transistor widths and bias voltages, minimizing substrate resistance, and by dc biasing the T_X and R_X nodes

