



Category: FET

CIRCUIT IDEAS FOR DESIGNERS

Schematic no. fet_11131.0

Simple FET Source Follower with Low Output Impedance

Description

This source follower has a high input impedance and a low output impedance. It is useful when the output of a signal source has a high impedance and the signal needs to be sent to a load with low impedance. If this source and the load were connected directly, there would be a large loss of signal level, much worse than the 0.95 gain when using a typical emitter follower.

A depletion mode FET or a low $V_{GS(th)}$ FET can be used for the simple source follower as shown. The input impedance is set by R_A , the output impedance is $1/g_m$ of the FET in parallel with R_B , and the gain is the ratio of R_{LOAD} in parallel with R_B to the sum of $1/g_m$ and the parallel combination of R_B and R_{LOAD} .

The design is started by first selecting the FET and the operating current. The current is set by the threshold voltage and R_B . R_B is replaced by Q2-R1 which acts as a current sink. The output impedance is set by the BJT Q3, which is significantly lower than the $1/g_m$ of the FET. The input impedance is bootstrapped by C2 which causes the low side of R4 to nearly follow the high side which multiplies the value of R4. The gain of the overall circuit is much closer to 1.00. This circuit can be used in SWR bridges or field strength meters for low power transmitters.

For full schematic diagram and notes, please register and login at aldinc.com