



FH1 Application Circuit for Cellular Bands

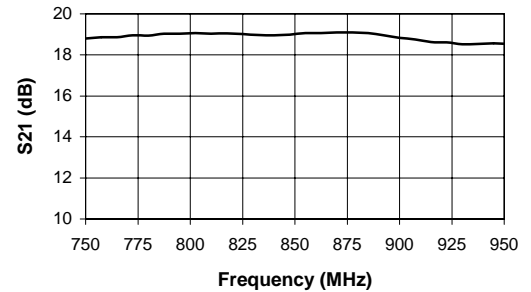
Summary:

This application note details the operation and schematic of an application circuit using a WJ Communications FH1 device optimized for the cellular bands. This circuit offers excellent performance for gain, IP3, P1dB, and noise figure using the WJ Communications low-cost FET between 750 – 950 MHz with the use of only a single supply. This circuit is ideal for use as driver circuits for infrastructure equipment in cellular applications.

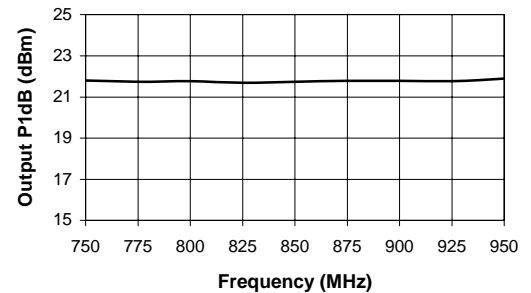
For any bands other than the ones described below, WJ Communications Applications Engineers will be on hand to give advice.

Frequency (MHz)	750	850	950
S21 - Gain (dB)	18.8	19.0	18.5
S11 - Input Return Loss (dB)	-10.8	-10.7	-8.5
S22 - Output Return Loss (dB)	-8.8	-9.7	-10.8
S12 - Isolation (dB)	-24.2	-23.2	-22.9
Output P1dB (dBm)	21.8	21.8	21.8
Output IP3 ¹ (dBm)	42.8	44.0	44.0
Noise Figure (dB)	3.1	2.7	2.5

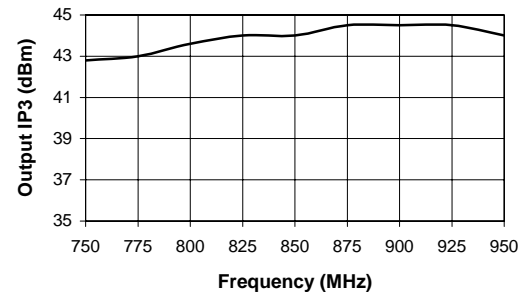
Gain vs Frequency



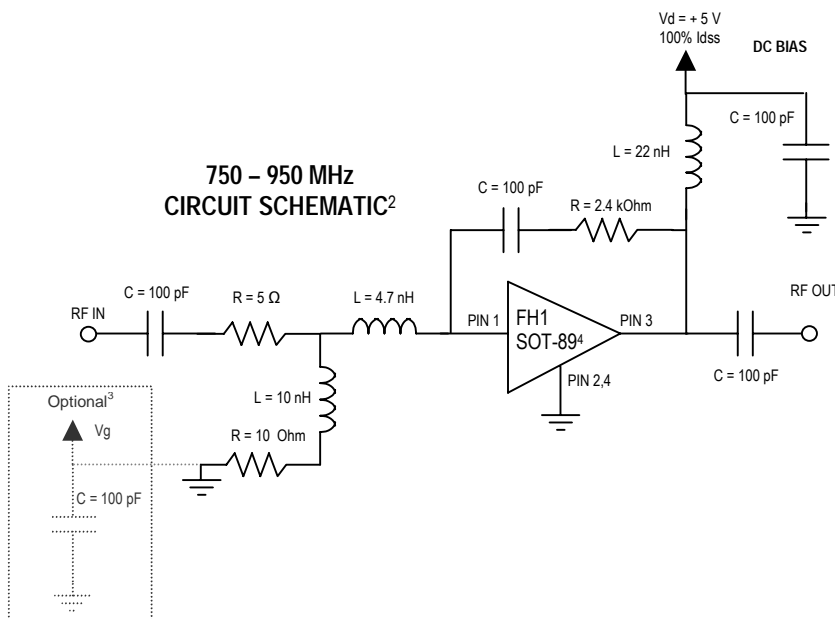
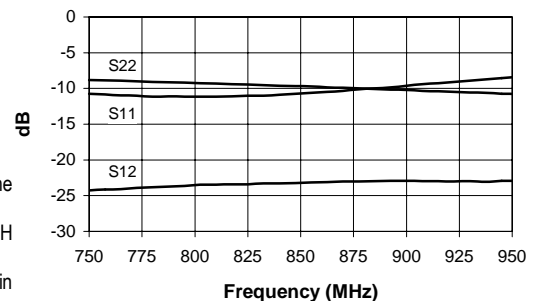
P1dB vs Frequency



OIP3 vs Frequency



S11, S12, S22 vs Frequency



¹ OIP3 is measured with 2 tones at an output power of 10 dBm/tone with 10 MHz spacing. The suppression on the largest IM3 product is used to calculate OIP3 using a 2:1 slope rule.
² All components are 0603 size. All components used are standard 5% tolerance parts. Toko LL1608-FH chip inductors were used in the design.
³ The circuitry in the dotted area can be added to bias the FET at various % Idss. The ground pin immediately outside of the dotted area needs to be removed. Increasing the magnitude of the negative Vg voltage decreases the current draw into the device. The performance at other % Idss may vary from the data shown above.
⁴ The FET should be mounted as shown in the FH1 datasheet.