

Homework No. 9

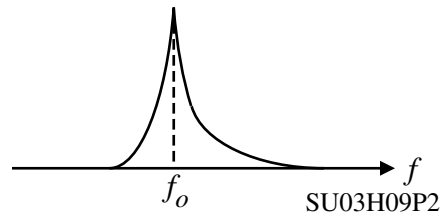
Due: Wednesday July 23, 2003

Problem 1 – (10 points)

A frequency synthesizer has a reference frequency of 5kHz and uses a 64/65 dual-modulus prescaler. Determine the values of the A and M counters to give an output frequency of 555.015 MHz.

Problem 2 – (10 points)

When testing a frequency synthesizer, you observe the frequency display shown above on a spectrum analyzer. What important fact is obvious from the display?

Problem 3 – (10 points)

What is the main advantage of a fractional- N PLL synthesizer over an ordinary PLL synthesizer? Explain.

Problem 4 – (10 points)

A 1600 MHz carrier together with a set of 20 kHz PM spurs are applied to a divide by 8 frequency divider. The power of the 200 MHz carrier frequency output of the divider is 0.2 mW and the 20 kHz spurs have an amplitude of 20 μ V. What is the phase deviation of the signal at the input of the divider? All impedances are 50 ohms.

Problem 5 – (10 points)

On page 200-16 of the lecture notes, the illustration of how a rotational frequency detector works is given. Use this diagram to clearly explain how the rotational frequency detector works.