

Mixer Notes

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With a voltage square pulse of period 2 microseconds and $V_{pp} = 2V$, when applying a continuous microwave rf signal of power 9.8 dBm and frequency:

1. 1.495 GHz, a strange oscillation forms between the two quasi sinusoidal peaks, and one with relatively high amplitude and appears well-ordered
2. 3.8 GHz, a valley forms between the 2 quasi sinusoidal peaks, and it relatively maximized at this frequency.
3. 4.79GHz, a hill forms between the 2 quasi sinusoidal peaks, when I flip the frequency up to 4.9 GHz, this hill immediately disappears.

Terminology for signal processing:

1. LO: Local oscillator port, the mixer uses the inputted signal in this port as a base frequency to increase/decrease the primary signal (this is always an inputted signal)
2. Rf: Radio frequency signal, used to inputs/outputs for signals like microwaves, etc.
3. IF: Intermediate frequency, this is the frequency that the carrier signal (primary signal with the information) is turned into.

Generally speaking, if the desired frequency is greater than the inputted frequency, then RF is the output and IF is the input. Vice versa.