

Re: wideband RF impedance matching

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 - *Date:* Mon, 12 Sep 2005 01:18:33 +0100
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steve wrote:

- > Tim,
- >
- > Yes, the impedance I gave was for the signal input. I'm trying to
- > create a 0–500MHz frequency generator and I've got a 250–500MHz VCO, so
- > I was going to mix the VCO output with a 250MHz LO signal from a
- > MAX2620 fixed frequency oscillator.
- >
- > Thanks to everyone for their replys, they've been really helpful!
- >
- > Steve

The signal inputs go straight to the emitters of the switching transistors, by the look of it. The impedance they give would be for small-signal operation e.g. in a receiver. Do you mind if there are harmonics in the input current? You could drive it hard, if you want lots of output power. The impedance would be different then but it doesn't matter, all that matters is the input current will come out the top of the mixing cell chopped up by the LO waveform. If you just use a centre-tapped mini-circuits transformer or something like that, with a resistor from the centre tap to ground to sink 20mA or so out of the centre tap, that ought to do. You wouldn't need much swing at the mixer inputs to fully switch the current from one side to the other, 100–200mV ought to do it. You will however need plenty of current so a transformer which steps down the voltage and steps up the current should help. The only problem is that if you drive it hard like this, then you will get other mixing products such as $3LO \pm 3RF$, which would be hard to get rid of. If you don't want these then you could put resistors in between the transformer and the input pins so that the current is sinusoidal again. The $3LO$, $5LO$ etc. frequencies will still be present in the LO however, because the limiting action of the LO buffer will create them. For that reason, with your VCO, I would try using a 500MHz fixed oscillator, so that $3LO \pm fVCO$ will be so high that you can filter it out effectively.

You might want to reconsider the oscillator frequencies, I don't know if it matters for you if there is some VCO leakage in the output. If you used a 750–1250MHz VCO and a 750MHz fixed oscillator, then it would be easier to get rid of any LO and VCO leakage.

Chris

• **References:**

- ◆ **wideband RF impedance matching**
 - ◇ *From: steve*
 - ◆ **Re: wideband RF impedance matching**
 - ◇ *From: Tim Wescott*
 - ◆ **Re: wideband RF impedance matching**
 - ◇ *From: steve*
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