

UVLBI MEMO #007

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March 1, 2006

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To: Millimeter VLBI Group

From: Alan E.E. Rogers

Subject: Test of National LMX2531 for DBE clock

National semiconductor makes a series of integrated VCO synthesizer chips. The LMX2531LQ2080E covers the frequency ranges 1904-2274 and 952-1137 MHz. The phase noise at 1 GHz is typically from manufacturer's plots:

Offset	dBc/Hz
10 kHz	-93
100 kHz	-119
1 MHz	-142
5 MHz	-154

I measured a total phase noise of about 2 ps rms relative to the 5 MHz reference on the TDS-820 scope. The phase stability was also measured using the TDS-820 using the set-up of figure 1. It is hard to measure any change with small temperature changes and I had to resort to direct heating of the chip with a heat gun. A temperature change from 80°F to 150° resulted in an increased delay of the 1024 MHz by 8 ps which corresponds to a temperature coefficient of 0.2 ps/°C

The loop setup using the code loader was ÷ 2
XTLMAN 36
C3 100pf
C4 100pf
R3 40K
R4 40K

REGS	MSB																					LSB
R0	1	0	0	1	1	0	0	1	0	0	1	1	0	1	1	0	0	0	0	0	0	0
R1	0	0	1	0	0	0	0	0	0	1	0	1	0	1	1	0	1	1	1	0	0	1
R2	0	1	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1
R3	1	1	1	0	1	1	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	1
R4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
R6	0	1	0	0	1	0	0	0	1	1	1	0	0	1	1	0	0	1	0	1	1	0
R7	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	1	1
R8	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
R9	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0	1	0
R12	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	1	0
R5	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0
R5 init1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
R5 init2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

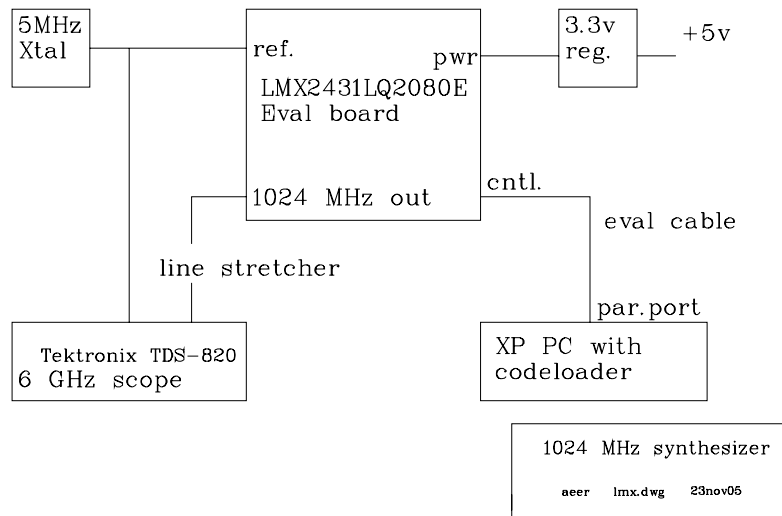


Figure 1. Test arrangement