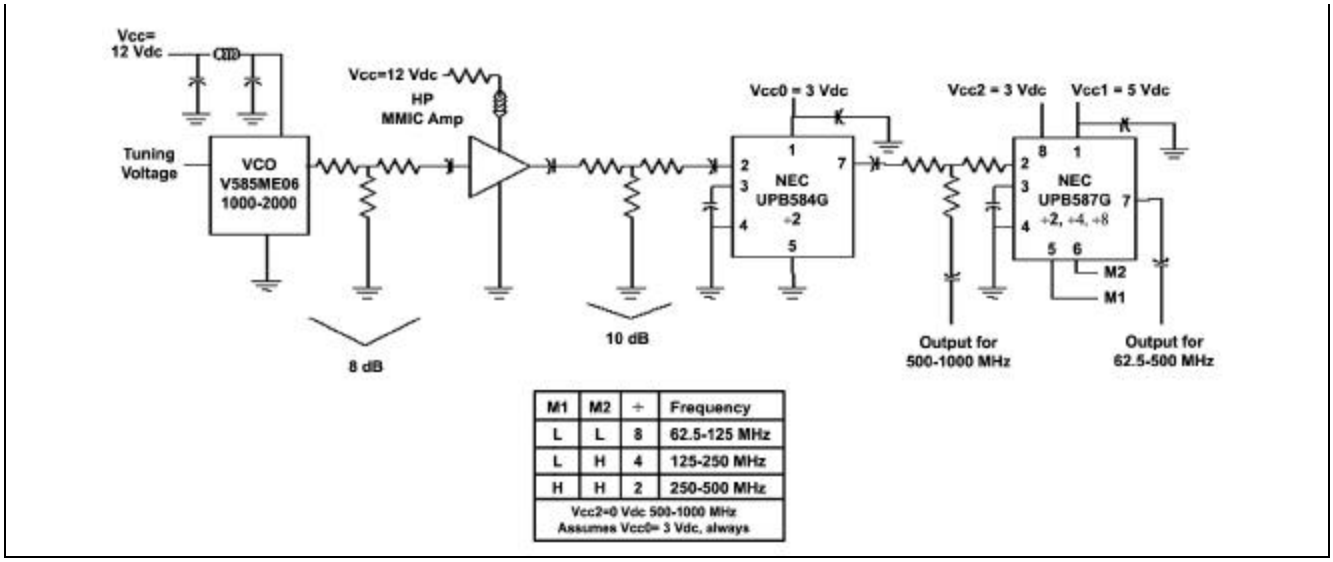
AN-103
Low Cost, Extremely Wide Bandwidth VCO Design Using Prescalers And Z-COMM VCOs

Many of Z-COMM's higher frequency VCOs can be converted, by the use of prescalers, into an extremely wide band, low frequency VCO at a low cost. For the following example, a 500-1000 MHz VCO will be converted into a 31.25-250 MHz VCO with the use of low cost programmable prescalers, such as the NEC UPB584G and UPB587G. Figure AN-103:1 represents a typical circuit layout.



M1	M2	÷	Frequency
L	L	8	62.5-125 MHz
L	H	4	125-250 MHz
H	H	2	250-500 MHz
Vcc2=0 Vdc 500-1000 MHz Assumes Vcc0= 3 Vdc, always			

Figure AN-103:1 — Schematic Drawing

In order to achieve the extremely wide bandwidth, the properly loaded output signal of the Z-COMM VCO will be subjected to a series of prescalers. The first prescaler, such as the NEC UPB584G, will divide the signal in half yielding an output of 500-1000 MHz. In order to achieve 62.5 MHz, a programmable prescaler, such as the NEC UPB587G, is needed. An 8-10 dB pad is recommended for proper matching of the signal between the two prescalers. The NEC UPB587G functions off of two TTL switches. When M1 and M2 are in the low state, the prescaler is a divide by 8 yielding a frequency output of 62.5-125 MHz. When M1 is in the low state and M2 is in the high state, the prescaler is a divide by 4 yielding an output of 125-250 MHz. When M1 and M2 are in the high state, the prescaler is a divide by 2 yielding an output of 250-500 MHz. When Vcc2 =0 Vdc, the output of the prescaler is 500-1000 MHz. Vcc0 and Vcc1 are assumed 3 Vdc and 5 Vdc, respectfully, at all times.

For additional information refer to the following Z-COMM application notes:

AN-101 Mounting and Grounding of VCOs
AN-102 Proper Loading of VCOs