CORRECTION COPY

Design Ideas

Versatile synthesizer controls 140 MHz

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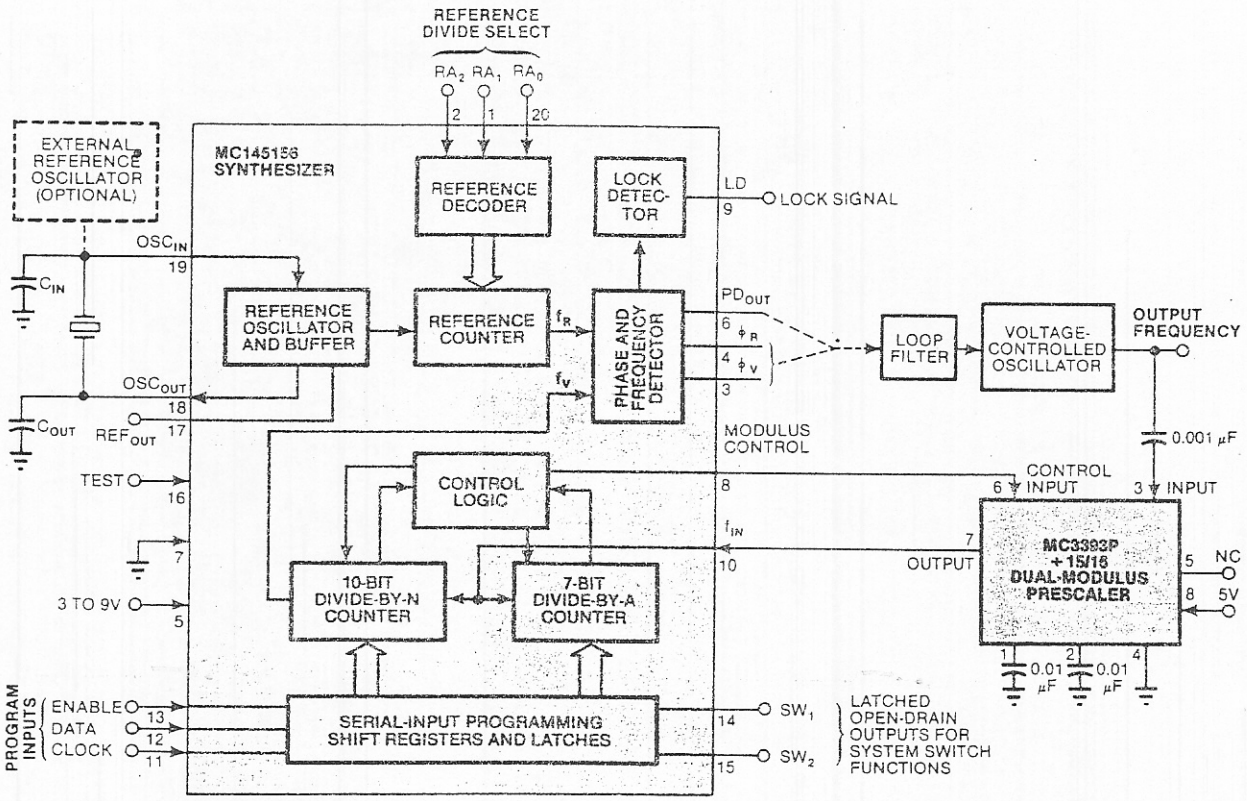
Dual-modulus prescaling is a standard technique for achieving high-performance, high-frequency phase-locked-loop frequency-synthesizer designs (**references**). Unfortunately, these designs often require eight to 12 ICs to provide true versatility. However, the 2-IC scheme outlined in the **figure** can directly control a synthesizer to 140 MHz. And by employing a higher frequency chip (such as the MC12009, 11 or 13) and a range-extending prescaler, you can push the concept to 500 MHz.

The MC3393P functions as a dual-modulus prescaler when the MC145156 frequency synthesizer's Modulus Control signal selects its divisor (15 or 16).



REFERENCE DIVIDE SELECT			TOTAL REFERENCE DIVIDE VALUE
RA_2	RA_1	RA_0	
0	0	0	8
0	0	1	64
0	1	0	128
0	1	1	256
1	0	0	640
1	0	1	1000
1	1	0	1024
1	1	1	2048

NOTE:
*CHOICE OF 3-STATE (PD_{OUT}) OR DOUBLE-ENDED (ϕ_R,ϕ_V) ERROR SIGNALS

Controllable frequency synthesis *results when you combine a 2-divider phase-locked-loop IC with a dual-modulus prescaler. Loop divisor ratios span 210 to 15,374, and output frequency can reach 140 MHz typ.*

OVER

Design Ideas

Because the prescaler's divisor gets controlled in this specific, timed-format method, the frequency synthesizer's relatively low-speed ÷N and ÷A counters take on the prescaler's high-frequency attributes.

Achieve an overall integer divide ratio (N_{TOTAL}) by programming the counters with the factors 15N+A for $A \leq N$. this programming yields an N_{TOTAL} spanning 210 to 15,374. Normally, you program A with values of 0 through 14 for a given N, increment N by 1 and repeat A's values. If you use the indicated 156-type synthesizer IC, counters N and A receive their data via a clocked, serial data stream through the Clock, Data and Enable inputs. Substituting an MC145152 in this socket permits parallel input programming; alternatively, you can employ an MC145146 in 4-bit-data-bus applications. **EDN**

References

Nichols, J, and Shinn, C, "Pulse Swallowing," *EDN*, October 1, 1970, pgs 39-42.

"The Technique of Direct Programming by Using a Two-Modulus Prescaler," Application Note AN-827, Motorola Inc, Semiconductor Group, 1981.

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No Reference to 145156 Being CMOS
" " " Low Power drain etc.