INEXPENSIVE LOW PHASE NOISE HIGH SPEED STABILIZED TIME BASE

ABSTRACT OF THE DISCLOSURE

A low phase noise high speed stabilized time base uses a crystal resonator that operates directly at a desired high frequency of one hundred to several hundred MHz. An inverted mesa AT-cut quartz crystal meets this criteria. To promote frequency stability the crystal and its oscillator circuit are thermally clamped to a convenient temperature that need be only loosely regulated, say, at about room temperature. In an exemplary ATE setting that already provides a water flow heat removal system whose supply side is 26° C, ± .5° C, a 400 MHz inverted mesa AT-cut crystal is simply given its own loop within that water supply. Other temperature stabilization techniques for loose regulation, such as Peltier cells, may be used. The result is a high frequency time base having adequate frequency accuracy and stability, but with the extremely low timing jitter of just the crystal resonator, since there is no contributory timing jitter from a frequency multiplying PLL.

Figure 2