

74123 IC

GATED 123 OSCILLATORS

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The action of two distinct types of gated oscillator is shown in Fig 1. Type A stops immediately the inhibit signal goes low, and starts immediately it goes high. (Hence fractional output pulses may be produced)

Type B finishes its current pulse before stopping when the inhibit signal goes low and like A starts immediately it goes high.

A is used when an oscillator has to be synchronized using pulses shorter than the output pulse and B is used when a number of whole pulses are required (the inhibit signal is obtained from the output of a counter).

It can be quite difficult to achieve a

type A oscillator that starts up without jitter using TTL. The circuit of Fig 2 shows how an SN74123 may be used to construct both types. A type A oscillator is obtained if the dotted connections are left out. The times t_1 and t_2 are set by the usual timing components see Fig 3 — the diode is needed if $C_{ext} > 1000p$ (across PA — MA and PB — MB respectively). The times may be calculated using:—

$$t = 0.32RT C_{ext} (1 + 0.7/RT)$$

if the diode is not required and

$$t = 0.28RT C_{ext} (1 + 0.7/RT)$$

otherwise.

RT is in kilo-ohms, C_{ext} is in picofarads, t is in nanoseconds and the maximum value of RT is 20k.

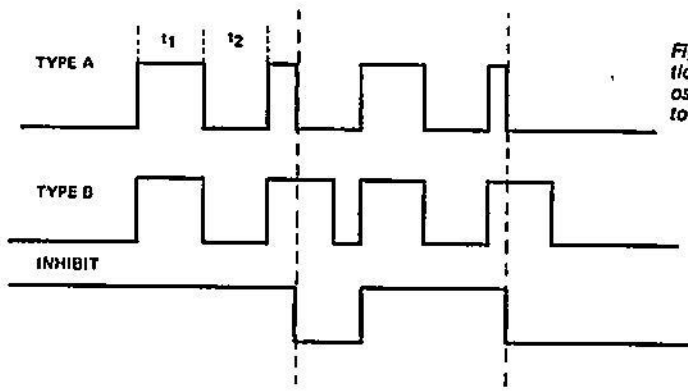


Fig 1. Left — operation of the two types of oscillator with respect to the inhibit signal

Fig 2 Right — connection to a 74123 to obtain both type of gated oscillator

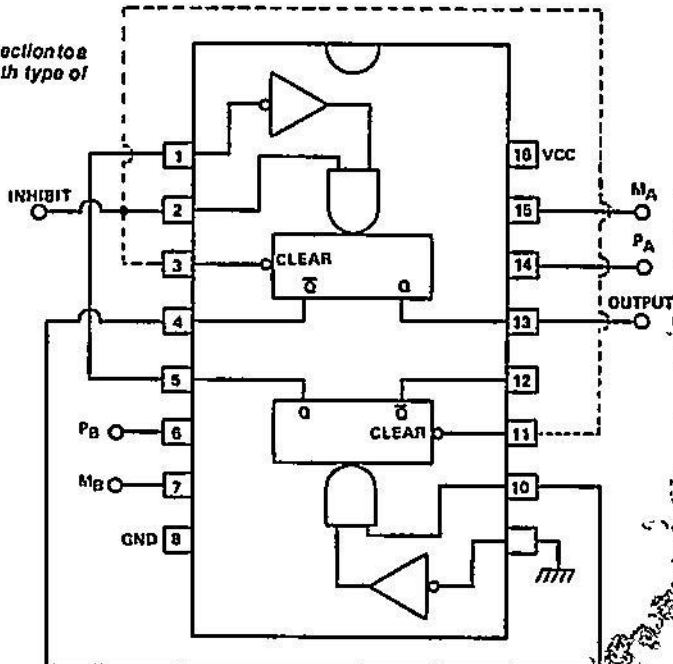


Fig 3 Below — arrangement of the timing components

