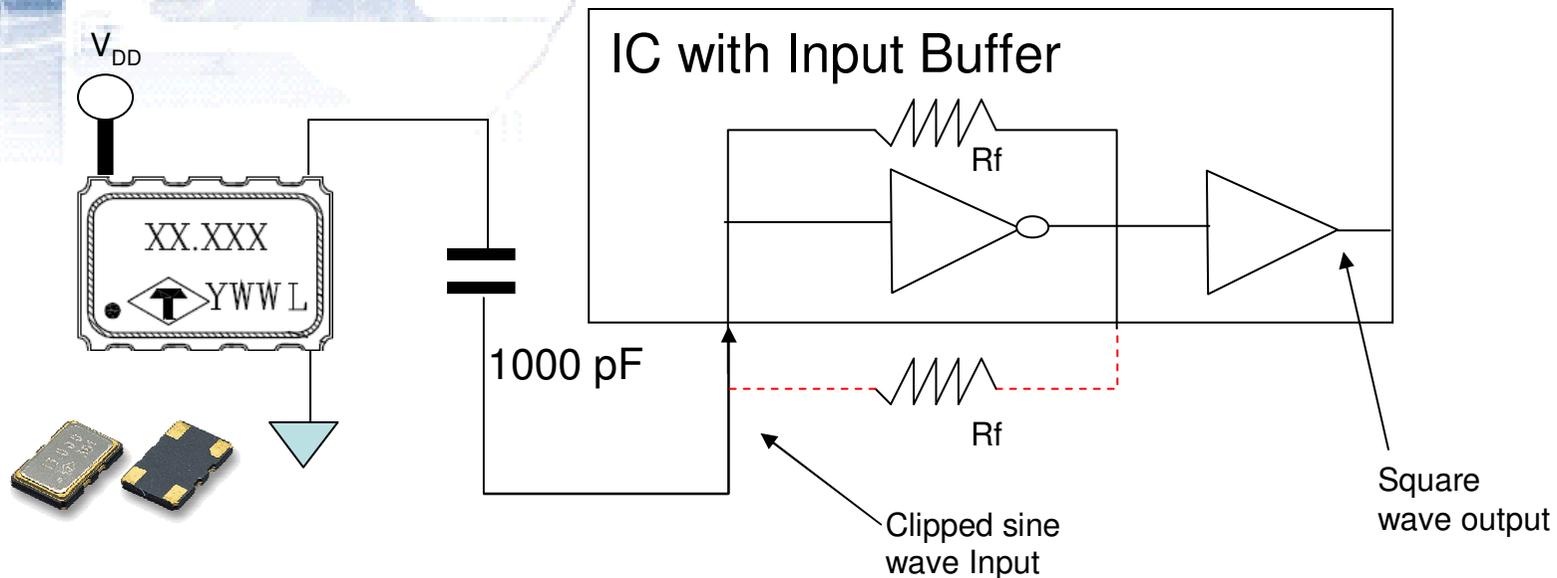


Application Notes: Utilize Clipped Sine Waveform in Circuit Design

Clipped Sine Waveform Output

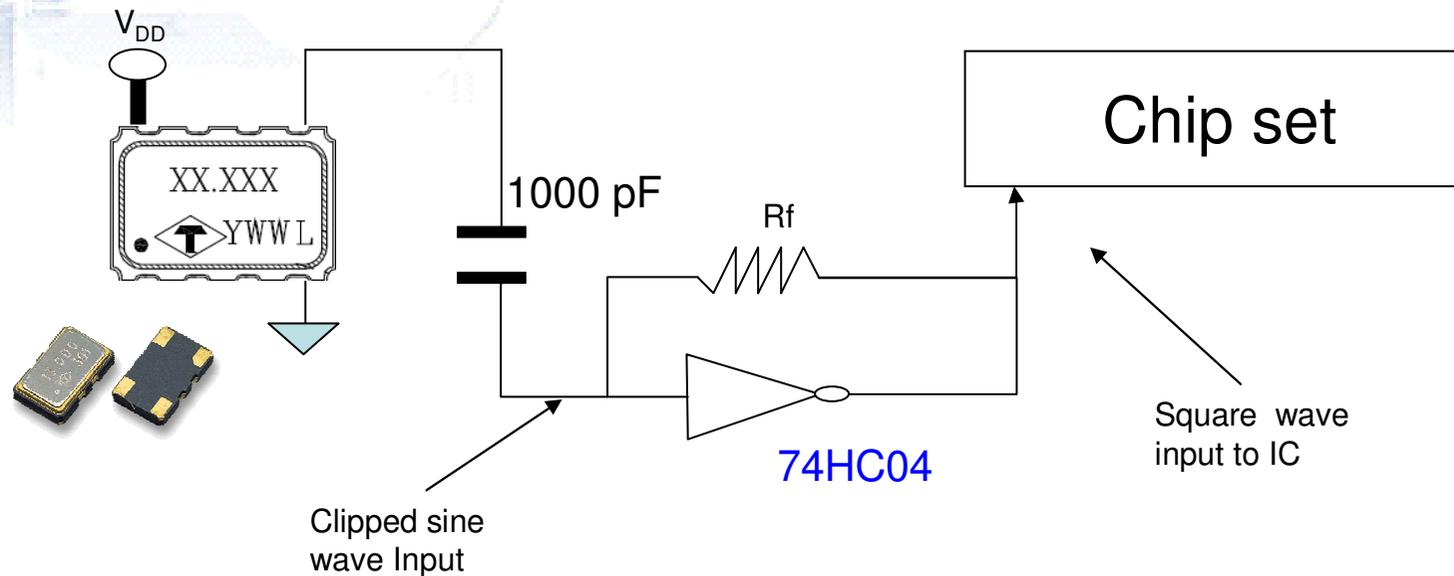
- Clipped sine waveform is the most popular output option for TCXOs.
 - Low power consumption for improved thermal characteristics → Better aging and frequency stability performance
 - Better phase noise performance than CMOS output

Using Clipped Sine Waveform with Chipset having Input Buffer



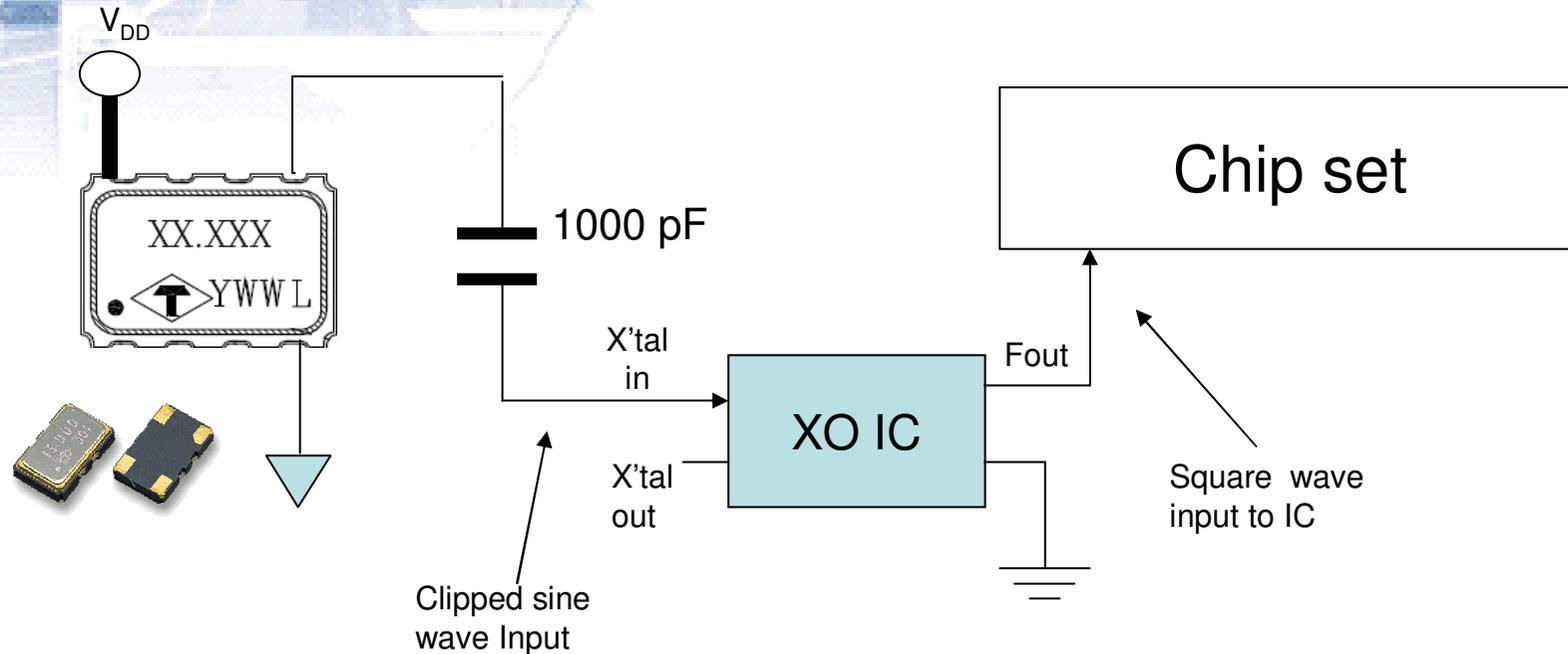
- To convert the clipped sine waveform to a square waveform signal such as CMOS, an input buffer is necessary.
- Generally, ICs that TCXO's output going into would have input buffer functionality integrated inside the chip. Oscillator circuit should have R_f feedback resistor connected in parallel with the inverter.
- If the IC does not have R_f resistor inside then an R_f resistor would need to be added externally between input pin and output pins of the inverter.
- The external R_f resistor value shall be between 100K to 10M ohm.
- Except for the 7x5mm product lines, a 1000 pF capacitor needs to be placed in series between the TCXO output pin and the IC clock input pin for all the other smaller form-factor TAI TIEN TCXOs.

Using Clipped Sine Waveform with Chipset without Input Buffer



- If the IC does not have input buffer functionality incorporated, an inverter such as 74HC04 and an R_f resistor would need to be added in series between the output pin of the TCXO and the clock input pin of the IC to convert the clipped sine waveform to a square waveform
- The external R_f resistor value shall be between 100K to 10M ohm.
- Except for the 7x5mm product lines, a 1000 pF capacitor needs to be placed in series between the TCXO output pin and the IC clock input pin for all the other smaller form-factor TAIEN TCXOs.

Using Clipped Sine Waveform in Conjunction with Oscillator IC



- TAI TIEN TCXO with clipped sine wave output can also be used in conjunction with an oscillator IC to generate square wave output for the chip set.
- The output from TCXO needs to be connected to the crystal input pin on the oscillator IC and the output pin from the oscillator IC shall be connected to the input pin on the chip set.
- Except for the 7x5mm product lines, a 1000 pF capacitor needs to be placed in series between the TCXO output pin and the IC clock input pin for all the other smaller form-factor TAI TIEN TCXOs.