

No signal output from the crystal on oscillation circuit?

If there is no signal output measured by two terminals of the crystal using oscilloscope or frequency counter, please follow the instructions to determine the factors and possible solutions.

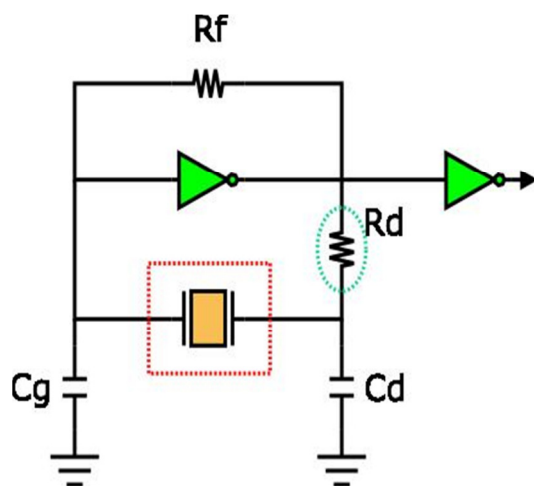
Step 1-1. Please examine the voltage of the in-terminal (Xin) and out- terminal (Xout) of the crystal and check whether the voltage is met according to IC spec.

Step 1-2. Please uninstall the crystal and test its frequency and load capacitance to see whether they vibrate and meet your specifications using a professional testing machine. You can also send it to your supplier to have them test it for you.

Step 1-3. If the crystal doesn't vibrate, its load capacitance doesn't match your specification, or there is a huge gap between current frequency and your targeted frequency, please send the crystal to your supplier to conduct Quality Analysis.

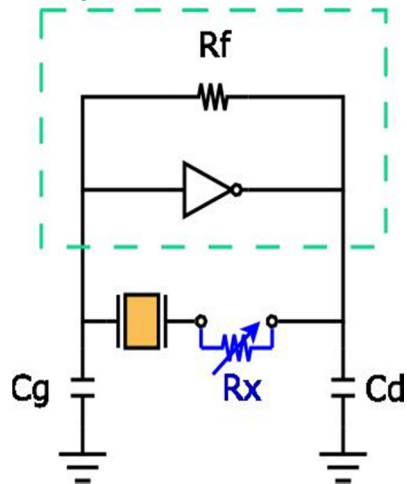
Step 1-4. If the frequency and load capacitance meet your specifications, but the problem also exists. The oscillation circuit evaluation will need to be executed. You can also send it to your supplier to have them test it for you.

Step 1-5. The following figure is shown as the general oscillation circuit where C_d and C_g are external load capacitances, R_f is the feedback resistance, and R_d is the Limit Resistor.



Negative resistance ($-R$) is the criterion to evaluate the quality of an oscillation circuit and its value should be at least five times of the crystal resistance in order to maintain a stable oscillation. Thus, it's very important to measure the negative resistance following the instructions as below:

Chipset



- (1) Connect the resistance (R_x) with the crystal in series
- (2) Adjust the value of R_x from the start point to the stop point of the oscillation.
- (3) Measure the value of R_x during oscillating.
- (4) You will be able to obtain the value of negative resistance, $|-R| = R_x + R_e$, and R_e = effective crystal resistance.

Step 1-6. If the negative resistance of IC is too low to drive the circuit, we propose three solutions to improve such case.

- (1) Lower the value of limit resistor (R_d). However, you should also confirm if the frequency shift and crystal driving current meet specifications at the same time.
- (2) Lower the value of external capacitance (C_g and C_d), and adopt other crystal with lower load capacitance (C_L).
- (3) Adopt a crystal with lower resistance (R_r).