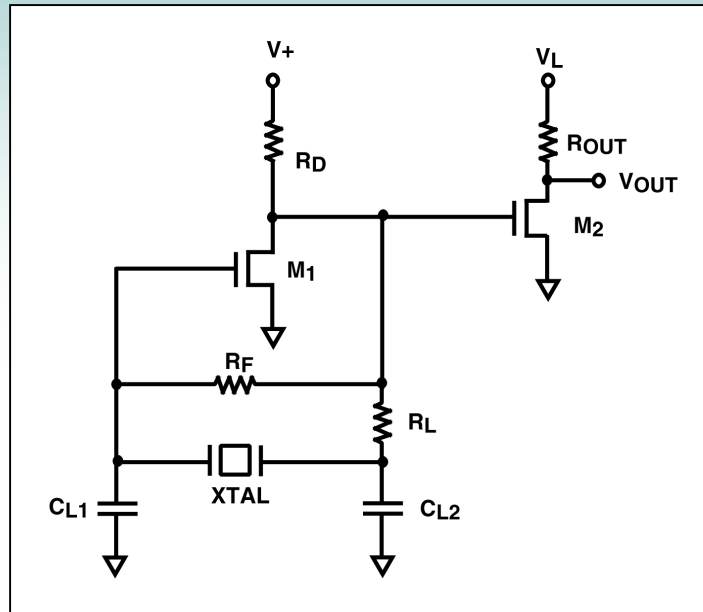


0.3V Crystal Oscillator Circuit with Buffered Output



Description

This is a crystal oscillator circuit that operates on a 0.3V power supply using EPAD MOSFETs with passive resistor load and output buffer. This circuit is similar to standard crystal oscillator circuit used in 5V circuits. However, at low operating voltages, the values of the resistors and the impedance of the inverter MOSFET are selected to optimize oscillation stability and at the same time minimize power consumption.

Some performance figures: $V_+ = 0.3V$, $I_+ = 24\mu A$, $P_d = 7\mu W$, Crystal frequency = 4 MHz.

V_L is an output voltage level that can be equal to, higher than or lower than V_+ , depending on desired output voltage swing levels. R_{OUT} must be selected for a selected V_L and at the same time minimize current drain. An example: $V_L = 0.1V$, $I_L = 17\mu A$, $P_D = 1.7\mu W$, $V_{OH} = 73mV$, $V_{OL} = 33mV$.

At higher crystal frequencies in excess of 4 MHz, a dual EPAD MOSFET can be connected in parallel to provide more low voltage drive current necessary.

Recommended Components

EPAD MOSFET: [ALD110900](#) (either single or dual MOSFET connected in parallel)
 $CL1 = 10pF$; $CL2 = 22pF$; $R_F = 5.6M\Omega$; $R_L = 6\Omega$; $R_D = 10K\Omega$; $R_{OUT} = 2.4K\Omega$

Other Related Circuit Ideas

[Schematic no. osc_42007.0](#) 0.5V Crystal Oscillator Circuit with Output Buffer