



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.

VL is an output voltage level that can be equal to, higher than or lower than V_+ , depending on desired output voltage swing levels. Rout must be selected for a selected VL 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.

For full schematic diagram and notes, please register and login at aldinc.com