LC (Colpitts) Oscillator operates on 0.5V to 5 V Single Supply

Description

This is a low-voltage LC (Colpitts) oscillator circuit using EPAD MOSFETs that operates on a single supply ranging from 0.5V to 5V. A dual EPAD MOSFET is connected in parallel to provide more low voltage drive current at lower supply voltages.

Oscillator Circuit Performance Data:

- $V_+ = 0.5V$, $I_+ = 25\mu A$, $P_D = 12.5\mu W$, Crystal frequency = 1 MHz.
- $V_+ = 5.0V$, $I_+ = 250\mu A$, $P_D = 1250\mu W$, Crystal frequency = 1 MHz.

The output buffer is powered by $V_L$ with pull up resistor $R_{OUT}$, which can be selected to optimize the output voltage swing levels as well as providing adequate output drive currents. $V_L$ 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.

Output Buffer performance Data:

- $V_L = 0.5V$, $I_L = 62\mu A$, $P_D = 31\mu W$, $V_{OH} = 350mV$, $V_{OL} = 226mV$.
- $V_L = 5.0V$, $I_L = 69\mu A$, $P_D = 347\mu W$, $V_{OH} = 4.78V$, $V_{OL} = 1.47V$.

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