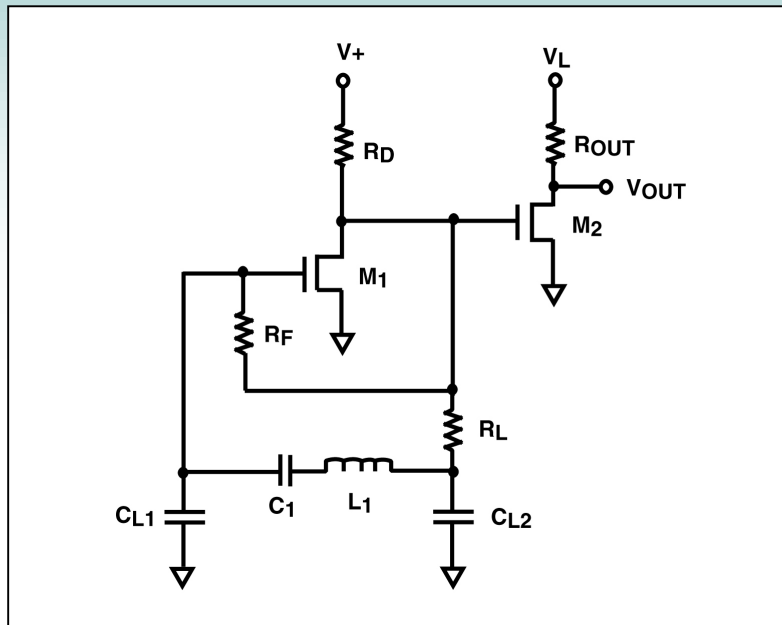




Nanopower LC (Colpitts) Oscillator Circuit



Description

This is an ultra low-voltage LC (Colpitts) oscillator circuit using EPAD MOSFETs with passive resistor load and output buffer operating on a single 0.17V power supply. This circuit is similar in configuration to a classic LC oscillator circuit in 5V circuits. A dual EPAD MOSFET is connected in parallel to provide more low voltage drive current as necessary. The output buffer is powered by R_{OUT} , which can be selected to optimize the output voltage swing levels as well as providing adequate output drive currents.

Some performance figures: $V_{+}=0.17V$, $I_{+}= 5\mu A$, $P_D=800nW$, Crystal frequency = 1 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: $V_L= 0.1V$, $I_L= 17\mu A$, $P_d= 1.7\mu W$, $V_{OH}=59mV$, $V_{OL}=48mV$.

Recommended Components

EPAD MOSFET: M1 [ALD110900](#) (dual MOSFET connected in parallel)

M2 [ALD114904](#)

$CL1=10pF$; $CL2 = 39pF$; $R_F= 5.6M\Omega$; $R_L= 6 \Omega$; $R_D= 20K\Omega$; $R_{OUT} = 2.4K\Omega$; $L_1 = 1mH$;

Other Related Circuit Ideas

[Schematic no. osc_42009.0](#) LC (Colpitts) Oscillator operates on 0.5V to 5 V Single Supply