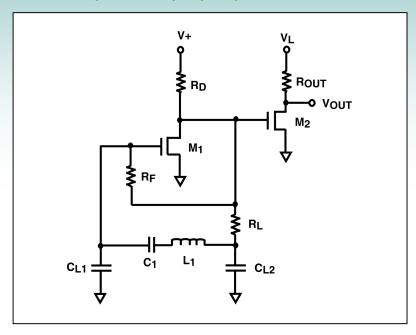


Category: Oscillators

CIRCUIT IDEAS FOR DESIGNERS

Schematic no. osc_42008.0

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 ROUT, 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+= $5\mu A$, PD=800nW, Crystal frequency = 1 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: VL= 0.1V, IL= 17μ A, Pd= 1.7μ W, VoH=59mV, VoL=48mV.

Recommended Components

EPAD MOSFET: M1 ALD110900 (dual MOSFET connected in parallel)

M2 AI D114904

CL1=10pF; CL2 = 39pF; RF= 5.6MOhm; RL= 6 Ohm; RD= 20KOhm; ROUT = 2.4KOhm; L1 = 1mH;

Other Related Circuit Ideas

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

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