

PSO Examples Part2 4_1_16 jmf

This paper discloses some variations of the **Pumped Saturating Oscillator**. The single ended was discussed in the previous PSO Examples paper and will not be discussed here.

3 COIL The geometry of the 3 coil transformer is with L1 centered in the core with L2 and L3 on each side of L1 on an ungapped set of Magnetics 42515-EC cores in P material. These cores are used in all the PSO variations. C1 and C2 are .047ufd film caps and L1 = 94T, and L2/L3 = 200T. The grounds on L2 and L3 may be switched depending on whether one wishes to have the outputs in or out of phase. The PSO_P2A scope pix shows the circuit with Vss = 60vdc. The outputs are out-of-phase and the complimentary slope differential in the peaks is due to interaction in the permeability's of each core half.

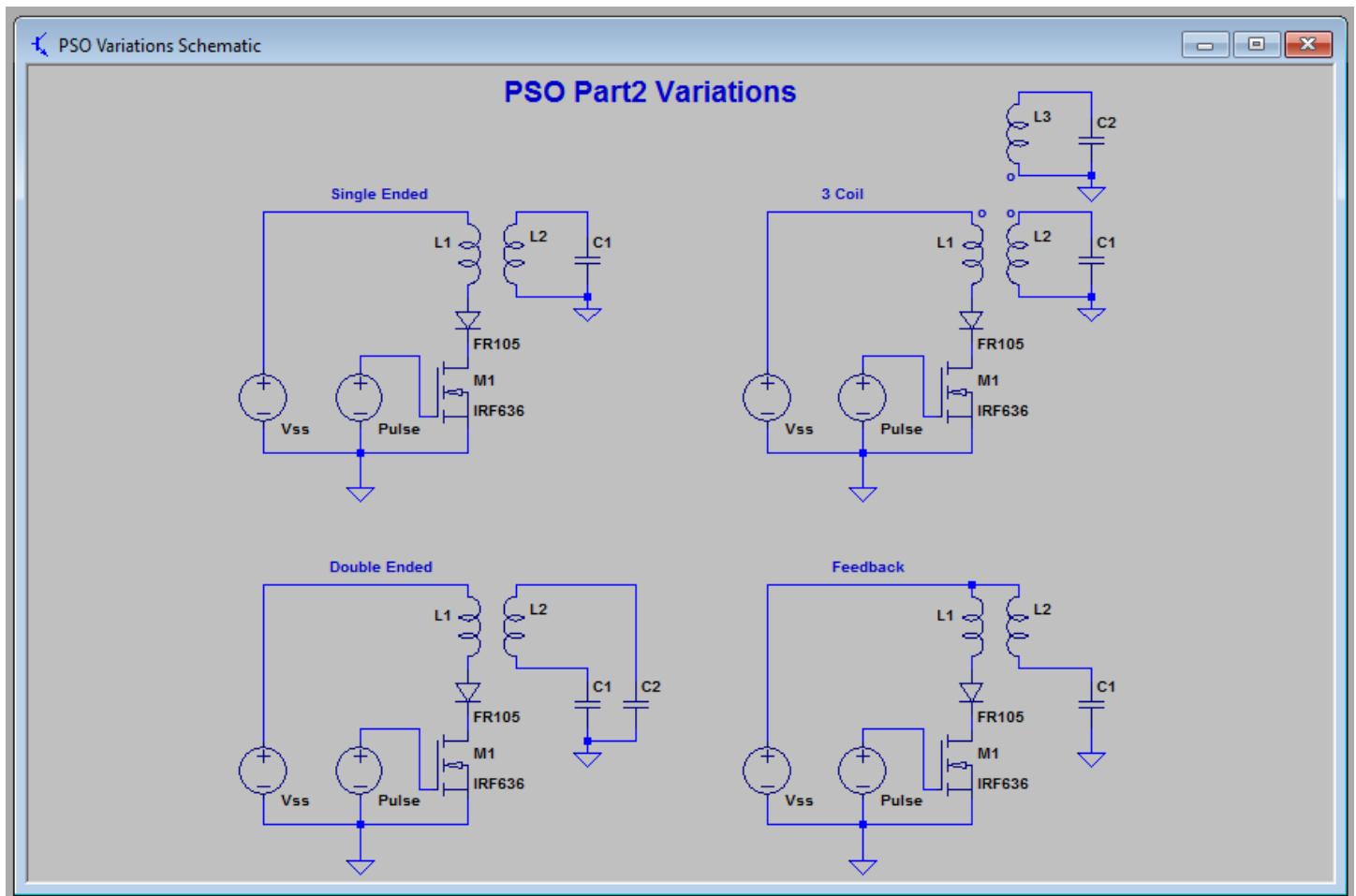
Scope pix PSO_P2B is the same circuit but operated with a Vss = 90vdc. Notice the reduction in input current reflecting that these device operate in a near constant power mode. IOW, as the supply increases, the input current decreases. This is a characteristic that is prevalent in all the PSO devices.

DOUBLE ENDED This double ended version contains two .047ufd output caps C1/C2 and is otherwise equal to the single ended version. Vss = 60vdc. This design results in two out-of-phase outputs as is shown in PSO_P2C scope pix. The reactive gain of the version is ~ 11.8 .

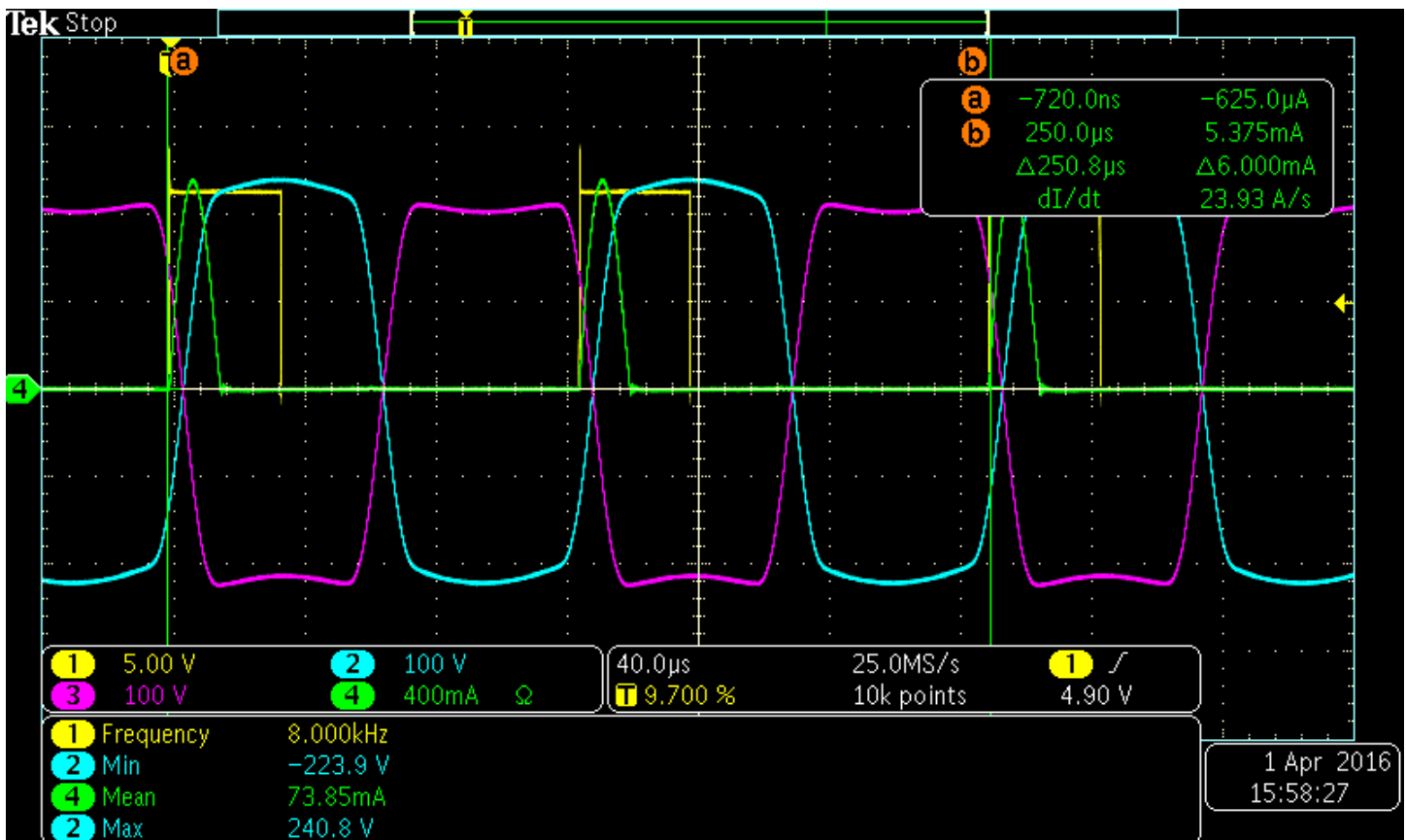
FEEDBACK The feedback version has one end of L2 the output winding connected to the supply or Vss. The phase is such that the reactive output current is out-of-phase with the input current drawn by the primary thus driving the input current negative during this portion of the cycle. However, due to this feedback connection, the remaining reactive output current is seen by Vss as a positive current but the overall result is a lower average power consumption on Vss. The scope pix PSO_P2D shows the waveforms for this version.

Conclusion: The PSO can be used as a source for ac voltage to drive capacitive loads or as a current pulse source for current transformers. Although these designs operate in the Khz range, they could operate in the Mhz range with the appropriate core, winding, and capacitor values.

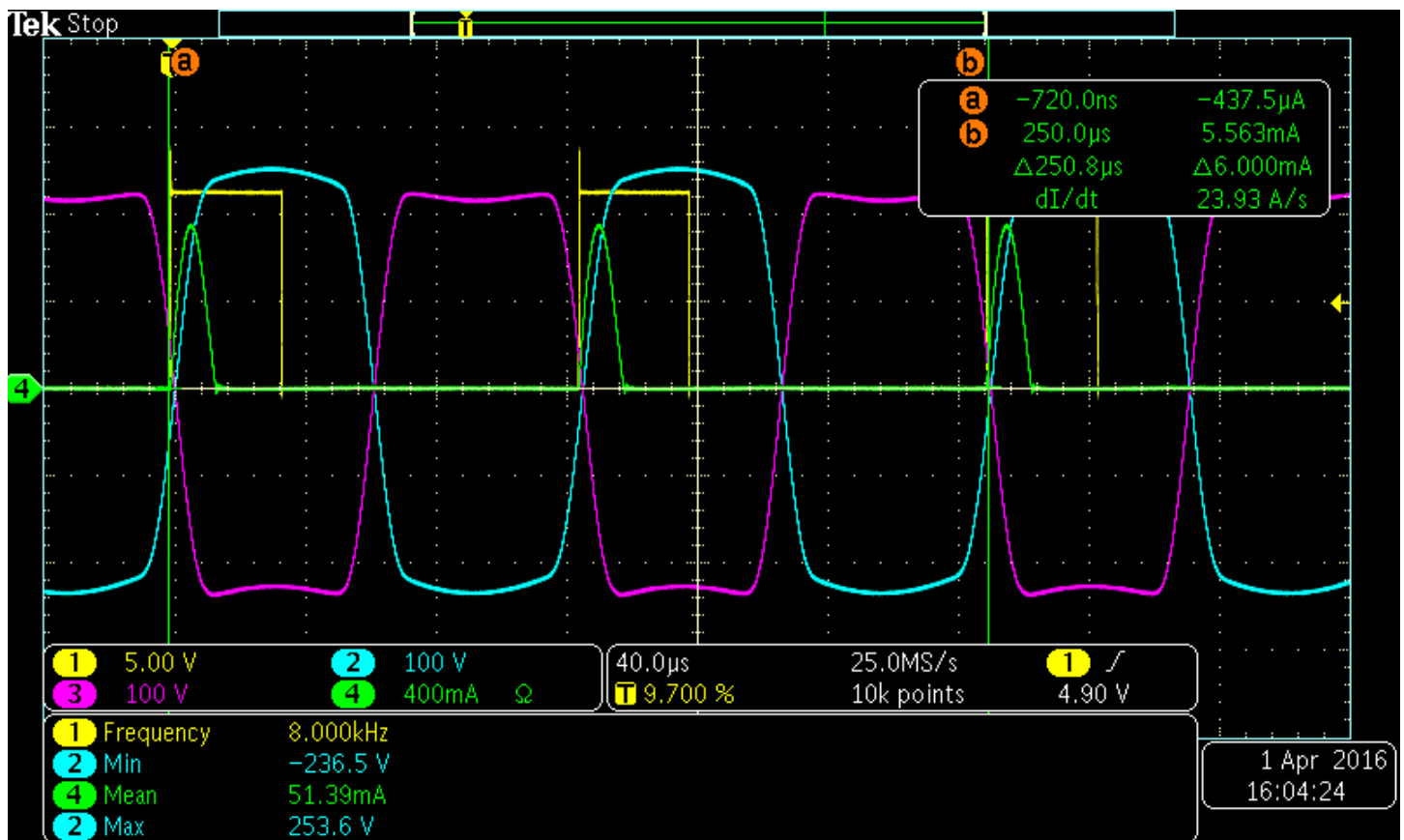
Jon Flickinger



PSO_P2A



PSO_P2B



PSO_P2C

