Class E PA Design - Enhanced. T.O. Bohlander WA3KLR 08/05/05. file: ClassE_PA_design4c VCC Reference: Class-E RF Power Amplifiers, by N. Sokal WA1HQC, QEX Jan/Feb 2001.



Notes:

Circuit Q must be greater than or equal to 1.79. Practical values should be between 3 - 15 and more ideally between 4 and 10.

The Q of **component L2** should be as high as possible. This would be a Q of 100 or greater, ideally more than 250.

VCC is the supply voltage at maximum positive modulation.

Transistor saturation voltage - a number between 0 and 5 Volts typically. Enter 0 for ideal studies.

Expected PA efficiency is a number between 1 and 100. Example: For 93.3 % eff., enter "93.3".

L1 is computed by multiplying "R" x "factor value". Practical factor value range is from 4 to 160. Note: The capacitive reactance of C1 is usually about $4.5 \times R$.

The drain BV safety factor should be 0.8 or lower.

The calculated values for C1 and C2 compensate for the value of L1 feed choke.

The spreadsheet value **shunt C1** is the total combined capacitance of PA transistor effective output capacitance plus an additional shunt capacitor component. So "component" C1 = (shunt C1) - (transistor effective output capacitance).

An L-C matching network is incorporated with (Ls + L2) and C3 to raise the 'R' output impedance of the tank circuit up to 50 Ohms output.