wastes ?

1. Keep L_p (the L parameter in the equations) and R_i (for current mode) on the primary side, and reflect C and R to the primary side via the following equations:

$$R' = R/N^2$$

$$C' = CN^2$$

$$\text{with } N = \frac{N_s}{N_p}$$

2. Calculate the secondary-side inductor value $L_s = L_p N^2$ and use the result as the parameter L in the equations. For current-mode control, reflect the primary-side sense resistor R_i to the secondary side via $R' = R/N^2$. Thus C and R can be kept at their original values.

CMC → Replace V_{in} with $N\,V_{in}$ $N = \left(\frac{N_s}{N_p}\right)$.

References

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APPENDIX 2B POLES, ZEROS, AND COMPLEX PLANE—A SIMPLE INTRODUCTION

When one is discussing stability, it is important to know why the positions of the poles and zeros in the complex plane are important. The general expression of the loop gain is usually found in the form

$$T(s) = \frac{b_0 + b_1 s + \cdots + b_m s^m}{a_0 + a_1 s + \cdots + a_n s^n} = \frac{N(s)}{D(s)} \tag{2B-1}$$

where $N(s)$ and $D(s)$, respectively, represent the numerator and denominator polynomials. One condition for the system to be stable is that the degree of the numerator always be smaller than the degree of the denominator: $m < n$. This condition, called *properness*, implies that $\lim_{s\to\infty} T(s) = 0$. A transfer function not adhering to this rule is said to be *improper*, for instance, if $\lim_{s\to\infty} T(s) = \infty$.

For certain values of s, the numerator or the denominator will go to zero. Finding the numerator and denominator roots help you to locate, respectively, the zeros and poles affecting the transfer function $T(s)$. To find the positions of the zeros, you need to find the roots verifying $N(s) = 0$. Zeros are frequency values that actually null the transfer function. For instance, suppose $N(s) = (s + 5k)(s + 30k)$. Then one zero occurs at 795 Hz ($5k/2\pi$) and another zero at 4.77 kHz ($30k/2\pi$). Note that the roots are negative since $s_{z1} = -5k$ and $s_{z2} = -30k$.

On the other hand, poles are found by solving the equation $D(s) = 0$. When the denominator cancels, the gain $T(s)$ goes to infinity. Suppose we have $D(s) = s^2(s-22k)$. Then calculation of its roots leads us to find a double pole at $s = 0$; this is a double pole placed at the origin.