1. Using the relation

$$F(z)=\frac{1}{2\pi}\int_{-\infty}^{\infty}e^{ikz}\tilde{F}(k)dk \ ,$$

we obtain

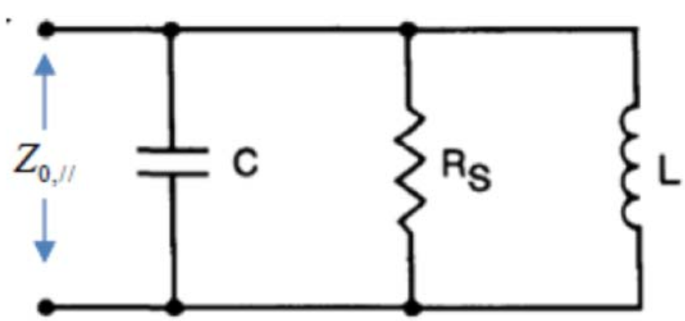
$$\begin{aligned}\sum_{l=-\infty}^{\infty}F(lC)&=\frac{1}{2\pi}\sum_{l=-\infty}^{\infty}\int_{-\infty}^{\infty}e^{iklC}\tilde{F}(k)dk\\&=\frac{1}{2\pi}\int_{-\infty}^{\infty}dk\tilde{F}(k)\sum_{l=-\infty}^{\infty}e^{i2\pi l\cdot\frac{kC}{2\pi}}\\&=\frac{1}{2\pi}\int_{-\infty}^{\infty}dk\tilde{F}(k)\sum_{p=-\infty}^{\infty}\delta\left(\frac{kC}{2\pi}-p\right)\\&=\frac{1}{2\pi}\sum_{p=-\infty}^{\infty}\int_{-\infty}^{\infty}\frac{2\pi\delta\left(k-\frac{2\pi p}{C}\right)}{C}\tilde{F}(k)dk\\&=\frac{1}{C}\sum_{p=-\infty}^{\infty}\tilde{F}\left(\frac{2\pi p}{C}\right)\end{aligned} \quad ,$$

where we also used

$$\delta(g(x))=\sum_i\frac{\delta(x-x_i)}{|g'(x_i)|}$$

with x_i being the roots of $g(x)$.

2.



The impedance is determined by

$$
\begin{aligned}
\frac{1}{Z_{0,//}} &= \frac{1}{Z_R} + \frac{1}{Z_L} + \frac{1}{Z_C} \\
&= \frac{1}{R_s} + \frac{1}{j\omega L} + j\omega C \\
&= \frac{1 + jR_s\sqrt{\frac{C}{L}}\left(\omega\sqrt{LC} - \frac{1}{\omega\sqrt{LC}}\right)}{R_s}\ , \\
&= \frac{1 + jQ\left(\frac{\omega}{\omega_R} - \frac{\omega_R}{\omega}\right)}{R_s} \\
&= \frac{1 + iQ\left(\frac{\omega_R}{\omega} - \frac{\omega}{\omega_R}\right)}{R_s}
\end{aligned}
$$

i.e.

$$
Z_{0,//} = \frac{R_s}{1 + iQ\left(\frac{\omega_R}{\omega} - \frac{\omega}{\omega_R}\right)}
$$

where $j = -i$, $Q \equiv R_s\sqrt{\frac{C}{L}}$ and $\omega_R \equiv \frac{1}{\sqrt{LC}}$.