Experiment: TIA simple Z4 ZL

Filter 1

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ R_3,\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 2

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ \frac{1}{C_3 s},\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 3

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ \frac{R_3}{C_3 R_3 s+1},\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 4

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ R_3+\frac{1}{C_3 s},\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 5

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ L_3 s+\frac{1}{C_3 s},\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 6

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ \frac{L_3 s}{C_3 L_3 s^2+1},\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 7

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ L_3 s+R_3+\frac{1}{C_3 s},\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 8

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ \frac{1}{C_3 s+\frac{1}{R_3}+\frac{1}{L_3 s}},\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 9

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ \frac{L_3 s}{C_3 L_3 s^2+1}+R_3,\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$

Filter 10

Filter Type: BP
$Z(s)$: $\left(\infty,\ \infty,\ \frac{R_3\left(L_3 s+\frac{1}{C_3 s}\right)}{L_3 s+R_3+\frac{1}{C_3 s}},\ \infty,\ \infty,\ \frac{1}{C_L s+\frac{1}{R_L}+\frac{1}{L_L s}}\right)$
$H(s)$: $\frac{\infty L_L R_L g_m s}{(\infty g_m+1)(C_L L_L R_L s^2+L_L s+R_L)}$
Q: $C_L R_L \sqrt{\frac{1}{C_L L_L}}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{1}{C_L R_L}$