Experiment: TIA simple Z2 Z4 ZL

Filter 1

Filter Type: GE
$Z(s)$: $\left(\infty,\ R_2,\ \infty,\ R_4,\ \infty,\ L_L s + R_L + \frac{1}{C_L s}\right)$
$H(s)$: $\frac{R_4\left(C_L L_L s^2 + C_L R_L s + 1\right)}{2C_L L_L s^2 + C_L R_4 s + 2C_L R_L s + 2}$
Q: $\frac{2L_L\sqrt{\frac{1}{C_L L_L}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{R_4 + 2R_L}{2L_L}$
Qz: $\frac{L_L\sqrt{\frac{1}{C_L L_L}}}{R_L}$

Filter 2

Filter Type: GE
$Z(s)$: $\left(\infty,\ R_2,\ \infty,\ R_4,\ \infty,\ \frac{L_4 s}{C_L L_4 s^2 + 1} + R_L\right)$
$H(s)$: $\frac{R_4\left(C_L L_L R_4 s^2 + L_L s + R_L\right)}{C_L L_L R_4 s^2 + 2C_L L_L R_L s^2 + 2L_L s + R_4 + 2R_L}$
Q: $\frac{C_L\sqrt{\frac{1}{C_L L_L}}\left(R_4 + 2R_L\right)}{2}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{2}{C_L\left(R_4 + 2R_L\right)}$
Qz: $C_L R_L\sqrt{\frac{1}{C_L L_L}}$

Filter 3

Filter Type: GE
$Z(s)$: $\left(\infty,\ R_2,\ \infty,\ L_4 s + R_4 + \frac{1}{C_4 s},\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L\left(C_4 L_4 s^2 + C_4 R_4 s + 1\right)}{C_4 L_4 s^2 + C_4 R_4 s + 2C_4 R_L s + 1}$
Q: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{R_4 + 2R_L}{L_4}$
Qz: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4}$

Filter 4

Filter Type: GE
$Z(s)$: $\left(\infty,\ R_2,\ \infty,\ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4,\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L\left(C_4 L_4 R_4 s^2 + L_4 s + R_4\right)}{C_4 L_4 R_4 s^2 + 2C_4 L_4 R_L s^2 + L_4 s + R_4 + 2R_L}$
Q: $C_4\sqrt{\frac{1}{C_4 L_4}}\left(R_4 + 2R_L\right)$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{1}{C_4\left(R_4 + 2R_L\right)}$
Qz: $C_4 R_4\sqrt{\frac{1}{C_4 L_4}}$

Filter 5

Filter Type: GE
$Z(s)$: $\left(\infty,\ \frac{1}{C_2 s},\ \infty,\ R_4,\ \infty,\ L_L s + R_L + \frac{1}{C_L s}\right)$
$H(s)$: $\frac{R_4\left(C_L L_L s^2 + C_L R_L s + 1\right)}{2C_L L_L s^2 + C_L R_4 s + 2C_L R_L s + 2}$
Q: $\frac{2L_L\sqrt{\frac{1}{C_L L_L}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{R_4 + 2R_L}{2L_L}$
Qz: $\frac{L_L\sqrt{\frac{1}{C_L L_L}}}{R_L}$

Filter 6

Filter Type: GE
$Z(s)$: $\left(\infty,\ \frac{1}{C_2 s},\ \infty,\ R_4,\ \infty,\ \frac{L_L s}{C_L L_L s^2 + 1} + R_L\right)$
$H(s)$: $\frac{R_4\left(C_L L_L R_4 s^2 + L_L s + R_L\right)}{C_L L_L R_4 s^2 + 2C_L L_L R_L s^2 + 2L_L s + R_4 + 2R_L}$
Q: $\frac{C_L\sqrt{\frac{1}{C_L L_L}}\left(R_4 + 2R_L\right)}{2}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{2}{C_L\left(R_4 + 2R_L\right)}$
Qz: $C_L R_L\sqrt{\frac{1}{C_L L_L}}$

Filter 7

Filter Type: GE
$Z(s)$: $\left(\infty,\ \frac{1}{C_2 s},\ \infty,\ L_4 s + R_4 + \frac{1}{C_4 s},\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L\left(C_4 L_4 s^2 + C_4 R_4 s + 1\right)}{C_4 L_4 s^2 + C_4 R_4 s + 2C_4 R_L s + 1}$
Q: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{R_4 + 2R_L}{L_4}$
Qz: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4}$

Filter 8

Filter Type: GE
$Z(s)$: $\left(\infty,\ \frac{1}{C_2 s},\ \infty,\ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4,\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L\left(C_4 L_4 R_4 s^2 + L_4 s + R_4\right)}{C_4 L_4 R_4 s^2 + 2C_4 L_4 R_L s^2 + L_4 s + R_4 + 2R_L}$
Q: $C_4\sqrt{\frac{1}{C_4 L_4}}\left(R_4 + 2R_L\right)$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{1}{C_4\left(R_4 + 2R_L\right)}$
Qz: $C_4 R_4\sqrt{\frac{1}{C_4 L_4}}$

Filter 9

Filter Type: GE
$Z(s)$: $\left(\infty,\ \frac{R_2}{C_2 R_2 s + 1},\ \infty,\ R_4,\ \infty,\ L_L s + R_L + \frac{1}{C_L s}\right)$
$H(s)$: $\frac{R_4\left(C_L L_L s^2 + C_L R_L s + 1\right)}{2C_L L_L s^2 + C_L R_4 s + 2C_L R_L s + 2}$
Q: $\frac{2L_L\sqrt{\frac{1}{C_L L_L}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{R_4 + 2R_L}{2L_L}$
Qz: $\frac{L_L\sqrt{\frac{1}{C_L L_L}}}{R_L}$

Filter 10

Filter Type: GE
Z(s): $\left(\infty,\ \frac{R_2}{C_2R_2s+1},\ \infty,\ R_4,\ \infty,\ \frac{L_Ls}{C_LL_Ls^2+1}+R_L\right)$
H(s): $\frac{R_4\left(C_LL_LR_Ls^2+L_Ls+R_L\right)}{C_LL_LR_4s^2+2C_LL_LR_Ls^2+2L_Ls+R_4+2R_L}$
Q: $\frac{C_L\sqrt{\frac{1}{C_LL_L}}\left(R_4+2R_L\right)}{2}$
ω₀: $\sqrt{\frac{1}{C_LL_L}}$
Bandwidth: $\frac{2}{C_L\left(R_4+2R_L\right)}$
Qz: $C_LR_L\sqrt{\frac{1}{C_LL_L}}$

Filter 11

Filter Type: GE
Z(s): $\left(\infty,\ \frac{R_2}{C_2R_2s+1},\ \infty,\ L_4s+R_4+\frac{1}{C_4s},\ \infty,\ R_L\right)$
H(s): $\frac{R_L\left(C_4L_4s^2+C_4R_4s+1\right)}{C_4L_4s^2+C_4R_4s+2C_4R_Ls+1}$
Q: $\frac{L_4\sqrt{\frac{1}{C_4L_4}}}{R_4+2R_L}$
ω₀: $\sqrt{\frac{1}{C_4L_4}}$
Bandwidth: $\frac{R_4+2R_L}{L_4}$
Qz: $\frac{L_4\sqrt{\frac{1}{C_4L_4}}}{R_4}$

Filter 12

Filter Type: GE
Z(s): $\left(\infty,\ \frac{R_2}{C_2R_2s+1},\ \infty,\ \frac{L_4s}{C_4L_4s^2+1}+R_4,\ \infty,\ R_L\right)$
H(s): $\frac{R_L\left(C_4L_4R_4s^2+L_4s+R_4\right)}{C_4L_4R_4s^2+2C_4L_4R_Ls^2+L_4s+R_4+2R_L}$
Q: $C_4\sqrt{\frac{1}{C_4L_4}}\left(R_4+2R_L\right)$
ω₀: $\sqrt{\frac{1}{C_4L_4}}$
Bandwidth: $\frac{1}{C_4\left(R_4+2R_L\right)}$
Qz: $C_4R_4\sqrt{\frac{1}{C_4L_4}}$

Filter 13

Filter Type: GE
Z(s): $\left(\infty,\ R_2+\frac{1}{C_2s},\ \infty,\ R_4,\ \infty,\ L_Ls+R_L+\frac{1}{C_Ls}\right)$
H(s): $\frac{R_4\left(C_LL_Ls^2+C_LR_Ls+1\right)}{2C_LL_Ls^2+C_LR_4s+2C_LR_Ls+2}$
Q: $\frac{2L_L\sqrt{\frac{1}{C_LL_L}}}{R_4+2R_L}$
ω₀: $\sqrt{\frac{1}{C_LL_L}}$
Bandwidth: $\frac{R_4+2R_L}{2L_L}$
Qz: $\frac{L_L\sqrt{\frac{1}{C_LL_L}}}{R_L}$

Filter 14

Filter Type: GE
Z(s): $\left(\infty,\ R_2+\frac{1}{C_2s},\ \infty,\ R_4,\ \infty,\ \frac{L_Ls}{C_LL_Ls^2+1}+R_L\right)$
H(s): $\frac{R_4\left(C_LL_LR_Ls^2+L_Ls+R_L\right)}{C_LL_LR_4s^2+2C_LL_LR_Ls^2+2L_Ls+R_4+2R_L}$
Q: $\frac{C_L\sqrt{\frac{1}{C_LL_L}}\left(R_4+2R_L\right)}{2}$
ω₀: $\sqrt{\frac{1}{C_LL_L}}$
Bandwidth: $\frac{2}{C_L\left(R_4+2R_L\right)}$
Qz: $C_LR_L\sqrt{\frac{1}{C_LL_L}}$

Filter 15

Filter Type: GE
Z(s): $\left(\infty,\ R_2+\frac{1}{C_2s},\ \infty,\ L_4s+R_4+\frac{1}{C_4s},\ \infty,\ R_L\right)$
H(s): $\frac{R_L\left(C_4L_4s^2+C_4R_4s+1\right)}{C_4L_4s^2+C_4R_4s+2C_4R_Ls+1}$
Q: $\frac{L_4\sqrt{\frac{1}{C_4L_4}}}{R_4+2R_L}$
ω₀: $\sqrt{\frac{1}{C_4L_4}}$
Bandwidth: $\frac{R_4+2R_L}{L_4}$
Qz: $\frac{L_4\sqrt{\frac{1}{C_4L_4}}}{R_4}$

Filter 16

Filter Type: GE
Z(s): $\left(\infty,\ R_2+\frac{1}{C_2s},\ \infty,\ \frac{L_4s}{C_4L_4s^2+1}+R_4,\ \infty,\ R_L\right)$
H(s): $\frac{R_L\left(C_4L_4R_4s^2+L_4s+R_4\right)}{C_4L_4R_4s^2+2C_4L_4R_Ls^2+L_4s+R_4+2R_L}$
Q: $C_4\sqrt{\frac{1}{C_4L_4}}\left(R_4+2R_L\right)$
ω₀: $\sqrt{\frac{1}{C_4L_4}}$
Bandwidth: $\frac{1}{C_4\left(R_4+2R_L\right)}$
Qz: $C_4R_4\sqrt{\frac{1}{C_4L_4}}$

Filter 17

Filter Type: GE
Z(s): $\left(\infty,\ L_2s+\frac{1}{C_2s},\ \infty,\ R_4,\ \infty,\ L_Ls+R_L+\frac{1}{C_Ls}\right)$
H(s): $\frac{R_4\left(C_LL_Ls^2+C_LR_Ls+1\right)}{2C_LL_Ls^2+C_LR_4s+2C_LR_Ls+2}$
Q: $\frac{2L_L\sqrt{\frac{1}{C_LL_L}}}{R_4+2R_L}$
ω₀: $\sqrt{\frac{1}{C_LL_L}}$
Bandwidth: $\frac{R_4+2R_L}{2L_L}$
Qz: $\frac{L_L\sqrt{\frac{1}{C_LL_L}}}{R_L}$

Filter 18

Filter Type: GE
Z(s): $\left(\infty,\ L_2s+\frac{1}{C_2s},\ \infty,\ R_4,\ \infty,\ \frac{L_Ls}{C_LL_Ls^2+1}+R_L\right)$
H(s): $\frac{R_4\left(C_LL_LR_Ls^2+L_Ls+R_L\right)}{C_LL_LR_4s^2+2C_LL_LR_Ls^2+2L_Ls+R_4+2R_L}$
Q: $\frac{C_L\sqrt{\frac{1}{C_LL_L}}\left(R_4+2R_L\right)}{2}$
ω₀: $\sqrt{\frac{1}{C_LL_L}}$
Bandwidth: $\frac{2}{C_L\left(R_4+2R_L\right)}$
Qz: $C_LR_L\sqrt{\frac{1}{C_LL_L}}$

Filter 19

Filter Type: GE
$Z(s)$: $\left(\infty,\ L_2 s + \frac{1}{C_2 s},\ \infty,\ L_4 s + R_4 + \frac{1}{C_4 s},\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L(C_4 L_4 s^2 + C_4 R_4 s + 1)}{C_4 L_4 s^2 + C_4 R_4 s + 2C_4 R_L s + 1}$
Q: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{R_4 + 2R_L}{L_4}$
Qz: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4}$

Filter 20

Filter Type: GE
$Z(s)$: $\left(\infty,\ L_2 s + \frac{1}{C_2 s},\ \infty,\ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4,\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L(C_4 L_4 R_4 s^2 + L_4 s + R_4)}{C_4 L_4 R_4 s^2 + 2C_4 L_4 R_L s^2 + L_4 s + R_4 + 2R_L}$
Q: $C_4\sqrt{\frac{1}{C_4 L_4}}\left(R_4 + 2R_L\right)$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{1}{C_4(R_4 + 2R_L)}$
Qz: $C_4 R_4\sqrt{\frac{1}{C_4 L_4}}$

Filter 21

Filter Type: GE
$Z(s)$: $\left(\infty,\ L_2 s + R_2 + \frac{1}{C_2 s},\ \infty,\ R_4,\ \infty,\ L_L s + R_L + \frac{1}{C_L s}\right)$
$H(s)$: $\frac{R_4(C_L L_L s^2 + C_L R_L s + 1)}{2C_L L_L s^2 + C_L R_4 s + 2C_L R_L s + 2}$
Q: $\frac{2L_L\sqrt{\frac{1}{C_L L_L}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{R_4 + 2R_L}{2L_L}$
Qz: $\frac{L_L\sqrt{\frac{1}{C_L L_L}}}{R_L}$

Filter 22

Filter Type: GE
$Z(s)$: $\left(\infty,\ L_2 s + R_2 + \frac{1}{C_2 s},\ \infty,\ R_4,\ \infty,\ \frac{L_L s}{C_L L_L s^2 + 1} + R_L\right)$
$H(s)$: $\frac{R_4(C_L L_L R_L s^2 + L_L s + R_L)}{C_L L_L R_4 s^2 + 2C_L L_L R_L s^2 + 2L_L s + R_4 + 2R_L}$
Q: $\frac{C_L\sqrt{\frac{1}{C_L L_L}}(R_4 + 2R_L)}{2}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{2}{C_L(R_4 + 2R_L)}$
Qz: $C_L R_L\sqrt{\frac{1}{C_L L_L}}$

Filter 23

Filter Type: GE
$Z(s)$: $\left(\infty,\ L_2 s + R_2 + \frac{1}{C_2 s},\ \infty,\ L_4 s + R_4 + \frac{1}{C_4 s},\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L(C_4 L_4 s^2 + C_4 R_4 s + 1)}{C_4 L_4 s^2 + C_4 R_4 s + 2C_4 R_L s + 1}$
Q: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{R_4 + 2R_L}{L_4}$
Qz: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4}$

Filter 24

Filter Type: GE
$Z(s)$: $\left(\infty,\ L_2 s + R_2 + \frac{1}{C_2 s},\ \infty,\ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4,\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L(C_4 L_4 R_4 s^2 + L_4 s + R_4)}{C_4 L_4 R_4 s^2 + 2C_4 L_4 R_L s^2 + L_4 s + R_4 + 2R_L}$
Q: $C_4\sqrt{\frac{1}{C_4 L_4}}\left(R_4 + 2R_L\right)$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{1}{C_4(R_4 + 2R_L)}$
Qz: $C_4 R_4\sqrt{\frac{1}{C_4 L_4}}$

Filter 25

Filter Type: GE
$Z(s)$: $\left(\infty,\ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2,\ \infty,\ R_4,\ \infty,\ L_L s + R_L + \frac{1}{C_L s}\right)$
$H(s)$: $\frac{R_4(C_L L_L s^2 + C_L R_L s + 1)}{2C_L L_L s^2 + C_L R_4 s + 2C_L R_L s + 2}$
Q: $\frac{2L_L\sqrt{\frac{1}{C_L L_L}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{R_4 + 2R_L}{2L_L}$
Qz: $\frac{L_L\sqrt{\frac{1}{C_L L_L}}}{R_L}$

Filter 26

Filter Type: GE
$Z(s)$: $\left(\infty,\ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2,\ \infty,\ R_4,\ \infty,\ \frac{L_L s}{C_L L_L s^2 + 1} + R_L\right)$
$H(s)$: $\frac{R_4(C_L L_L R_L s^2 + L_L s + R_L)}{C_L L_L R_4 s^2 + 2C_L L_L R_L s^2 + 2L_L s + R_4 + 2R_L}$
Q: $\frac{C_L\sqrt{\frac{1}{C_L L_L}}(R_4 + 2R_L)}{2}$
ω_0: $\sqrt{\frac{1}{C_L L_L}}$
Bandwidth: $\frac{2}{C_L(R_4 + 2R_L)}$
Qz: $C_L R_L\sqrt{\frac{1}{C_L L_L}}$

Filter 27

Filter Type: GE
$Z(s)$: $\left(\infty,\ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2,\ \infty,\ L_4 s + R_4 + \frac{1}{C_4 s},\ \infty,\ R_L\right)$
$H(s)$: $\frac{R_L(C_4 L_4 s^2 + C_4 R_4 s + 1)}{C_4 L_4 s^2 + C_4 R_4 s + 2C_4 R_L s + 1}$
Q: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4 + 2R_L}$
ω_0: $\sqrt{\frac{1}{C_4 L_4}}$
Bandwidth: $\frac{R_4 + 2R_L}{L_4}$
Qz: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4}$

Filter 28

Filter Type: GE

$Z(s)$: $\left(\infty,\ \frac{L_2 s}{C_2 L_2 s^2+1}+R_2,\ \infty,\ \frac{L_4 s}{C_4 L_4 s^2+1}+R_4,\ \infty,\ R_L\right)$

$H(s)$: $\frac{R_4\left(C_4 L_4 R_4 s^2+L_4 s+R_4\right)}{C_4 L_4 R_4 s^2+2C_4 L_4 R_L s^2+L_4 s+R_4+2R_L}$

Q: $C_4\sqrt{\frac{1}{C_4 L_4}}\left(R_4+2R_L\right)$

ω_0: $\sqrt{\frac{1}{C_4 L_4}}$

Bandwidth: $\frac{1}{C_4\left(R_4+2R_L\right)}$

Qz: $C_4 R_4\sqrt{\frac{1}{C_4 L_4}}$

Filter 29

Filter Type: GE

$Z(s)$: $\left(\infty,\ \frac{R_2\left(L_2 s+\frac{1}{C_2 s}\right)}{L_2 s+R_2+\frac{1}{C_2 s}},\ \infty,\ R_4,\ \infty,\ L_L s+R_L+\frac{1}{C_L s}\right)$

$H(s)$: $\frac{R_4\left(C_L L_L s^2+C_L R_L s+1\right)}{2C_L L_L s^2+C_L R_4 s+2C_L R_L s+2}$

Q: $\frac{2L_L\sqrt{\frac{1}{C_L L_L}}}{R_4+2R_L}$

ω_0: $\sqrt{\frac{1}{C_L L_L}}$

Bandwidth: $\frac{R_4+2R_L}{2L_L}$

Qz: $\frac{L_L\sqrt{\frac{1}{C_L L_L}}}{R_L}$

Filter 30

Filter Type: GE

$Z(s)$: $\left(\infty,\ \frac{R_2\left(L_2 s+\frac{1}{C_2 s}\right)}{L_2 s+R_2+\frac{1}{C_2 s}},\ \infty,\ R_4,\ \infty,\ \frac{L_L s}{C_L L_L s^2+1}+R_L\right)$

$H(s)$: $\frac{R_4\left(C_L L_L R_L s^2+L_L s+R_L\right)}{C_L L_L R_4 s^2+2C_L L_L R_L s^2+2L_L s+R_4+2R_L}$

Q: $\frac{C_L\sqrt{\frac{1}{C_L L_L}}\left(R_4+2R_L\right)}{2}$

ω_0: $\sqrt{\frac{1}{C_L L_L}}$

Bandwidth: $\frac{2}{C_L\left(R_4+2R_L\right)}$

Qz: $C_L R_L\sqrt{\frac{1}{C_L L_L}}$

Filter 31

Filter Type: GE

$Z(s)$: $\left(\infty,\ \frac{R_2\left(L_2 s+\frac{1}{C_2 s}\right)}{L_2 s+R_2+\frac{1}{C_2 s}},\ \infty,\ L_4 s+R_4+\frac{1}{C_4 s},\ \infty,\ R_L\right)$

$H(s)$: $\frac{R_L\left(C_4 L_4 s^2+C_4 R_4 s+1\right)}{C_4 L_4 s^2+C_4 R_4 s+2C_4 R_L s+1}$

Q: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4+2R_L}$

ω_0: $\sqrt{\frac{1}{C_4 L_4}}$

Bandwidth: $\frac{R_4+2R_L}{L_4}$

Qz: $\frac{L_4\sqrt{\frac{1}{C_4 L_4}}}{R_4}$

Filter 32

Filter Type: GE

$Z(s)$: $\left(\infty,\ \frac{R_2\left(L_2 s+\frac{1}{C_2 s}\right)}{L_2 s+R_2+\frac{1}{C_2 s}},\ \infty,\ \frac{L_4 s}{C_4 L_4 s^2+1}+R_4,\ \infty,\ R_L\right)$

$H(s)$: $\frac{R_L\left(C_4 L_4 R_4 s^2+L_4 s+R_4\right)}{C_4 L_4 R_4 s^2+2C_4 L_4 R_L s^2+L_4 s+R_4+2R_L}$

Q: $C_4\sqrt{\frac{1}{C_4 L_4}}\left(R_4+2R_L\right)$

ω_0: $\sqrt{\frac{1}{C_4 L_4}}$

Bandwidth: $\frac{1}{C_4\left(R_4+2R_L\right)}$

Qz: $C_4 R_4\sqrt{\frac{1}{C_4 L_4}}$