Filter Summary Report: CG,TIA,simple,Z3,ZL

Generated by MacAnalog-Symbolix

January 17, 2025

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9 INVALID-WZ

10 INVALID-ORDER
10.1 INVALID-ORDER-1 $Z(s) = (\infty, \infty, R_3, \infty, \infty, R_L)$
10.2 INVALID-ORDER-2 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{1}{C_L s}\right)$
10.3 INVALID-ORDER-3 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$
10.4 INVALID-ORDER-4 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, R_L + \frac{1}{C_L s}\right)$
10.5 INVALID-ORDER-5 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, R_L\right)$
10.6 INVALID-ORDER-6 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s}\right)$
10.7 INVALID-ORDER-7 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$
10.8 INVALID-ORDER-8 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \infty, R_L + \frac{1}{C_L s}\right)$
10.9 INVALID-ORDER-9 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)$
$10.10 \text{INVALID-ORDER-10 } Z(s) = \left(\infty, \ \infty, \ \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{L_L s}{C_L L_L s^2 + 1} \right) \dots $
10.11INVALID-ORDER-11 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)$
$10.12 \text{INVALID-ORDER-12 } Z(s) = \left(\infty, \ \infty, \ \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1} \right) \dots $
$10.13 \text{INVALID-ORDER-13 } Z(s) = \left(\infty, \ \infty, \ \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{R_L \left(C_L L_L s^2 + 1 \right)}{C_L L_L s^2 + C_L R_L s + 1} \right)' \dots \dots$
10.14INVALID-ORDER-14 $Z(s) = \left(\infty, \infty, \frac{R_3}{C_2R_2s+1}, \infty, \infty, R_L\right)$
10.15INVALID-ORDER-15 $Z(s) = \left(\infty, \infty, \frac{R_3}{C_2 R_2 s + 1}, \infty, \infty, \frac{1}{C_1 s}\right)$
$10.16 \text{INVALID-ORDER-} 16 \ Z(s) = \left(\infty, \ \infty, \ \frac{R_3}{C_3 R_3 s + 1}, \ \infty, \ \infty, \ \frac{R_L}{C_L R_L s + 1} \right) \ \dots $
$10.17 \text{INVALID-ORDER-17 } Z(s) = \left(\infty, \ \infty, \ \frac{R_3}{C_2 R_2 s + 1}, \ \infty, \ \infty, \ L_L s + \frac{1}{C_L s}\right) \ \dots $
10.18INVALID-ORDER-18 $Z(s) = \left(\infty, \infty, \frac{R_3}{C_2R_2s+1}, \infty, \infty, L_Ls + R_L + \frac{1}{C_Ls}\right)$
$10.19 \text{INVALID-ORDER-19 } Z(s) = \left(\infty, \ \infty, \ \frac{R_3}{C_3 R_3 s + 1}, \ \infty, \ \infty, \ \frac{C_L L_L R_L s^2 + L_L s^2 + L_L}{C_L L_L s^2 + 1} \right) \dots $
$10.20 \text{INVALID-ORDER-20 } Z(s) = \left(\infty, \ \infty, \ \frac{R_3}{C_3 R_3 s+1}, \ \infty, \ \infty, \ \frac{R_L \left(C_L L_L s^2 + 1 \right)}{C_L L_L s^2 + C_L R_L s+1} \right)' $
10.21INVALID-ORDER-21 $Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_2 s}, \infty, \infty, R_L\right)$
10.22INVALID-ORDER-22 $Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s}\right)$
$10.23 \text{INVALID-ORDER-} 23 \ Z(s) = \left(\infty, \ \infty, \ R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ R_L + \frac{1}{C_L s}\right) \ \dots $
$10.24 \text{INVALID-ORDER-} 24 \ Z(s) = \left(\infty, \ \infty, \ R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ L_L s + \frac{1}{C_L s}\right) \dots $
$10.25 \text{INVALID-ORDER-} 25 \ Z(s) = \left(\infty, \ \infty, \ R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{L_L s}{C_L L_L s^2 + 1} \right)' \ \dots $
$10.26 \text{INVALID-ORDER-} 26 \ Z(s) = \left(\infty, \ \infty, \ R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ L_L s + R_L + \frac{1}{C_L s} \right) \dots $
$10.27 \text{INVALID-ORDER-} 27 \ Z(s) = \left(\infty, \ \infty, \ R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right) \ \dots $
$10.28 \text{INVALID-ORDER-} 28 \ Z(s) = \left(\infty, \ \infty, \ R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1} \right) \ \dots $
$10.29 \text{INVALID-ORDER-29 } Z(s) = \left(\infty, \ \infty, \ R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{R_L \left(C_L L_L s^2 + 1 \right)}{C_L L_L s^2 + C_L R_L s + 1} \right)' $
10.30INVALID-ORDER-30 $Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s}\right)$
10.31INVALID-ORDER-31 $Z(s) = \left(\infty, \infty, L_3s + \frac{1}{C_3s}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$
10.32INVALID-ORDER-32 $Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s}\right)$
10.33INVALID-ORDER-33 $Z(s) = \left(\infty, \infty, L_3s + \frac{1}{C_3s}, \infty, \infty, L_Ls + \frac{1}{C_Ls}\right)$
$10.34 \text{INVALID-ORDER-} 34 \ Z(s) = \left(\infty, \ \infty, \ L_3 s + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{L_L s}{C_L L_L s^2 + 1} \right)' \qquad \dots $
$10.35 \text{INVALID-ORDER-35 } Z(s) = \left(\infty, \ \infty, \ L_3 s + \frac{1}{C_3 s}, \ \infty, \ \infty, \ L_L s + R_L + \frac{1}{C_L s} \right) $
$10.36 \text{INVALID-ORDER-} 36 \ Z(s) = \left(\infty, \ \infty, \ L_3 s + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L} \right) \dots $
$10.37 \text{INVALID-ORDER-37 } Z(s) = \left(\infty, \ \infty, \ L_3 s + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{C_L L_R L_S^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right) \dots $
$10.38 \text{INVALID-ORDER-38 } Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L \left(C_L L_L s^2 + 1 \right)}{C_L L_L s^2 + C_L R_L s + 1} \right)' \dots \dots$
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10.39INVALID-ORDER-39 Z(s) = \left(\infty, \infty, \frac{L_3s}{C_3L_3s^2+1}, \infty, \infty, \frac{1}{C_Ls}\right) . . . . . . . . . .
10.40INVALID-ORDER-40 Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_2 L_3 s^2 + 1}, \infty, \infty, R_L + \frac{1}{C_L s}\right)
10.41INVALID-ORDER-41 Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_2 s^2 + 1}, \infty, \infty, L_L s + \frac{1}{C_L s}\right) . . . . .
10.42INVALID-ORDER-42 Z(s) = \left(\infty, \infty, \frac{L_3s}{C_3L_3s^2+1}, \infty, \infty, \frac{L_Ls}{C_LL_Ls^2+1}\right) . . . . .
10.43INVALID-ORDER-43 Z(s) = \left(\infty, \infty, \frac{L_{3s}}{C_3 L_3 s^2 + 1}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)
10.44INVALID-ORDER-44 Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_2 L_2 s^2 + 1}, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)
10.45INVALID-ORDER-45 Z(s) = \left(\infty, \ \infty, \ \frac{L_{3s}}{C_3L_3s^2+1}, \ \infty, \ \infty, \ \frac{R_L(C_LL_Ls^2+1)}{C_LL_Ls^2+C_LR_Ls+1}\right)
10.46INVALID-ORDER-46 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_2 s}, \infty, \infty, \frac{1}{C_4 s}\right)
10.47INVALID-ORDER-47 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_{2s}}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)
10.48INVALID-ORDER-48 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s}\right)
10.49INVALID-ORDER-49 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)
10.50INVALID-ORDER-50 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_0 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1}\right)
10.51INVALID-ORDER-51 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)
10.52INVALID-ORDER-52 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)
10.53INVALID-ORDER-53 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{C_L L_R L_S^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)
10.54INVALID-ORDER-54 Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L(C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1}\right)
10.55INVALID-ORDER-55 Z(s) = (\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, R_L + \frac{1}{C_L s}) . . . .
10.56INVALID-ORDER-56 Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_2 L_2 R_3 s^2 + L_2 s + R_3}, \infty, \infty, L_L s + \frac{1}{C_L s}\right) \dots
10.57INVALID-ORDER-57 Z(s) = \left(\infty, \infty, \frac{L_3 R_{3s}}{C_3 L_3 R_{3s}^2 + L_3 s + R_3}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right).
10.58INVALID-ORDER-58 Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)
10.59INVALID-ORDER-59 Z(s) = \left(\infty, \infty, \frac{L_3 R_{3s}}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \infty, \frac{R_L (C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1}\right)
10.60INVALID-ORDER-60 Z(s) = (\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_2 L_3 s^2 + 1}, \infty, \infty, \frac{1}{C_L s}) \dots \dots
10.61INVALID-ORDER-61 Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_2 L_3 s^2 + 1}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)
10.62INVALID-ORDER-62 Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_3 L_3 s^2 + 1}, \infty, \infty, R_L + \frac{1}{C_L s}\right)
10.63INVALID-ORDER-63 Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_2 L_2 s^2 + 1}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)
10.64INVALID-ORDER-64 Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_2 L_3 s^2 + 1}, \infty, \infty, \frac{L_L s}{C_L L_1 s^2 + 1}\right)
10.65INVALID-ORDER-65 Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_3 L_3 s^2 + 1}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)
10.66INVALID-ORDER-66 Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_2 L_2 s^2 + 1}, \infty, \infty, \infty, \frac{L_L R_L s}{C_1 L_1 R_1 s^2 + L_1 s + R_L}\right)
10.67INVALID-ORDER-67 Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_7 L_3 s^2 + 1}, \infty, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_7 L_3 s^2 + 1}\right)
10.68INVALID-ORDER-68 Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_3 L_3 s^2 + 1}, \infty, \infty, \infty, \frac{R_L \left(C_L L_L s^2 + 1\right)}{C_L L_L s^2 + C_L R_L s + 1}\right)
                                                             \left(\infty, \ \infty, \ \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ \frac{1}{C_Ls}\right)
10.69INVALID-ORDER-69 Z(s) = 1
10.70INVALID-ORDER-70 Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \frac{R_L}{C_LR_Ls+1}\right)
                                                             \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ R_L + \frac{1}{C_Ls}\right)
10.71INVALID-ORDER-71 Z(s) = 1
                                                             \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ L_Ls+\frac{1}{C_{Ls}}\right)
10.72INVALID-ORDER-72 Z(s) = 1
                                                              \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ \frac{L_Ls}{C_LL_Ls^2+1}\right)
10.73INVALID-ORDER-73 Z(s) =
                                                             \infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, L_Ls+R_L+\frac{1}{C_Ls}
                                                                                                                                                        10.74INVALID-ORDER-74 Z(s) = 1
10.75INVALID-ORDER-75 Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \infty, \frac{L_LR_Ls}{C_LL_LR_Ls^2+L_Ls+R_L}\right)
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10.76INVALID-ORDER-76 $Z(s) = \left(\infty, \infty, \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \infty, \frac{C_LL_LR_Ls^2+L_Ls+R_L}{C_LL_Ls^2+1}\right)$)	:
10.77INVALID-ORDER-77 $Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \infty, \frac{R_L(C_LL_Ls^2+1)}{C_LL_Ls^2+C_LR_Ls+1}\right)$		

11 PolynomialError

1 Examined H(z) for CG TIA simple Z3 ZL: $\frac{Z_3Z_Lg_m}{Z_3g_m+Z_Lg_m}$

$$H(z) = \frac{Z_3 Z_L g_m}{Z_3 g_m + Z_L g_m}$$

- 2 HP
- 3 BP
- 3.1 BP-1 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1}\right)$

$H(s) = \frac{L_L R_3 s}{C_L L_L R_3 s^2 + L_L s + R_3}$

Parameters:

Q:
$$C_L R_3 \sqrt{\frac{1}{C_L L_L}}$$

wo: $\sqrt{\frac{1}{C_L L_L}}$
bandwidth: $\frac{1}{C_L R_3}$
K-LP: 0
K-HP: 0
K-BP: R_3
Qz: None
Wz: None

3.2 BP-2 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)$

$H(s) = \frac{L_L R_3 R_L s}{C_L L_L R_3 R_L s^2 + R_3 R_L + s \left(L_L R_3 + L_L R_L\right)}$

Parameters:

Q:
$$\frac{C_L R_3 R_L \sqrt{\frac{1}{C_L L_L}}}{R_3 + R_L}$$
wo:
$$\sqrt{\frac{1}{C_L L_L}}$$
bandwidth:
$$\frac{R_3 + R_L}{C_L R_3 R_L}$$
K-LP: 0
K-HP: 0
K-BP:
$$\frac{R_3 R_L}{R_3 + R_L}$$
Qz: None
Wz: None

3.3 BP-3 $Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)$

$$H(s) = \frac{L_L R_L s}{L_L s + R_L + s^2 (C_3 L_L R_L + C_L L_L R_L)}$$

Q:
$$C_3 R_L \sqrt{\frac{1}{C_3 L_L + C_L L_L}} + C_L R_L \sqrt{\frac{1}{C_3 L_L + C_L L_L}}$$

wo: $\sqrt{\frac{1}{C_3 L_L + C_L L_L}}$
bandwidth: $\frac{\sqrt{\frac{1}{C_3 L_L + C_L L_L}}}{C_3 R_L \sqrt{\frac{1}{C_3 L_L + C_L L_L}} + C_L R_L \sqrt{\frac{1}{C_3 L_L + C_L L_L}}}$
K-LP: 0
K-HP: 0
K-BP: R_L

3.4 BP-4
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1}\right)$$

Q:
$$C_3R_3\sqrt{\frac{1}{C_3L_L+C_LL_L}} + C_LR_3\sqrt{\frac{1}{C_3L_L+C_LL_L}}$$
 wo: $\sqrt{\frac{1}{C_3L_L+C_LL_L}}$ bandwidth: $\frac{\sqrt{\frac{1}{C_3L_L+C_LL_L}}}{C_3R_3\sqrt{\frac{1}{C_3L_L+C_LL_L}} + C_LR_3\sqrt{\frac{1}{C_3L_L+C_LL_L}}}$ K-LP: 0 K-HP: 0 K-BP: R_3 Qz: None Wz: None

3.5 BP-5
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)$$

Parameters:

$$\begin{array}{l} \text{Q:} \ \frac{C_{3}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{L}+C_{L}L_{L}}} + C_{L}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{L}+C_{L}L_{L}}}}{R_{3}+R_{L}} \\ \text{wo:} \ \sqrt{\frac{1}{C_{3}L_{L}+C_{L}L_{L}}} \\ \text{bandwidth:} \ \frac{(R_{3}+R_{L})\sqrt{\frac{1}{C_{3}L_{L}+C_{L}L_{L}}}}{C_{3}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{L}+C_{L}L_{L}}} + C_{L}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{L}+C_{L}L_{L}}}} \\ \text{K-LP:} \ 0 \\ \text{K-HP:} \ 0 \\ \text{K-BP:} \ \frac{R_{3}R_{L}}{R_{3}+R_{L}} \\ \text{Qz:} \ \text{None} \\ \text{Wz:} \ \text{None} \end{array}$$

3.6 BP-6
$$Z(s) = \left(\infty, \infty, \frac{L_{3s}}{C_{3}L_{3}s^{2}+1}, \infty, \infty, R_{L}\right)$$

Q:
$$C_3R_L\sqrt{\frac{1}{C_3L_3}}$$

wo: $\sqrt{\frac{1}{C_3L_3}}$
bandwidth: $\frac{1}{C_3R_L}$
K-LP: 0
K-HP: 0
K-BP: R_L
Qz: None
Wz: None

$$H(s) = \frac{L_{L}R_{3}s}{L_{L}s + R_{3} + s^{2}\left(C_{3}L_{L}R_{3} + C_{L}L_{L}R_{3}\right)}$$

$$H(s) = \frac{L_{L}R_{3}R_{L}s}{R_{3}R_{L} + s^{2}\left(C_{3}L_{L}R_{3}R_{L} + C_{L}L_{L}R_{3}R_{L}\right) + s\left(L_{L}R_{3} + L_{L}R_{L}\right)}$$

$$H(s) = \frac{L_3 R_L s}{C_3 L_3 R_L s^2 + L_3 s + R_L}$$

3.7 BP-7
$$Z(s) = \left(\infty, \infty, \frac{L_{3s}}{C_{3}L_{3s^{2}+1}}, \infty, \infty, \frac{R_{L}}{C_{L}R_{L}s+1}\right)$$

$$H(s) = \frac{L_3 R_L s}{L_3 s + R_L + s^2 \left(C_3 L_3 R_L + C_L L_3 R_L \right)}$$

$$\begin{array}{l} \text{Q: } C_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}} + C_{L}R_{L}\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}\\ \text{wo: } \sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}\\ \text{bandwidth: } \frac{\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}}{C_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}} + C_{L}R_{L}\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}}\\ \text{K-LP: 0}\\ \text{K-HP: 0}\\ \text{K-BP: } R_{L}\\ \text{Qz: None}\\ \text{Wz: None} \end{array}$$

3.8 BP-8 $Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)$

$$H(s) = \frac{L_3 L_L R_L s}{L_3 L_L s + L_3 R_L + L_L R_L + s^2 \left(C_3 L_3 L_L R_L + C_L L_3 L_L R_L \right)}$$

Parameters:

$$\begin{array}{c} \text{Q: } C_{3}R_{L}\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}} + C_{L}R_{L}\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}} \\ \text{wo: } \sqrt{\frac{L_{3}+L_{L}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}}} \\ \text{bandwidth: } \frac{\sqrt{\frac{L_{3}+L_{L}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}}}}{C_{3}R_{L}\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}}} + C_{L}R_{L}\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}}}} \\ \text{K-LP: 0} \\ \text{K-HP: 0} \\ \text{K-BP: } \frac{R_{L}\sqrt{\frac{L_{3}}{C_{3}L_{L}+C_{L}}L_{L}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}}}{\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}}L_{3}L_{L}}}} \\ \text{Qz: None} \\ \text{Wz: None} \end{array}$$

3.9 BP-9 $Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, R_L\right)$

$$H(s) = \frac{L_3 R_3 R_L s}{C_3 L_3 R_3 R_L s^2 + R_3 R_L + s \left(L_3 R_3 + L_3 R_L\right)}$$

Parameters:

$$\begin{array}{l} \text{Q:} \ \frac{C_{3}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}}}}{R_{3}+R_{L}} \\ \text{wo:} \ \sqrt{\frac{1}{C_{3}L_{3}}} \\ \text{bandwidth:} \ \frac{R_{3}+R_{L}}{C_{3}R_{3}R_{L}} \\ \text{K-LP:} \ 0 \\ \text{K-HP:} \ 0 \\ \text{K-BP:} \ \frac{R_{3}R_{L}}{R_{3}+R_{L}} \\ \text{Qz:} \ \text{None} \\ \text{Wz:} \ \text{None} \end{array}$$

3.10 BP-10 $Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{1}{C_L s}\right)$

$$H(s) = \frac{L_3 R_3 s}{L_3 s + R_3 + s^2 \left(C_3 L_3 R_3 + C_L L_3 R_3\right)}$$

Q:
$$C_3R_3\sqrt{\frac{1}{C_3L_3+C_LL_3}}+C_LR_3\sqrt{\frac{1}{C_3L_3+C_LL_3}}$$
 wo: $\sqrt{\frac{1}{C_3L_3+C_LL_3}}$ bandwidth: $\frac{\sqrt{\frac{1}{C_3L_3+C_LL_3}}}{C_3R_3\sqrt{\frac{1}{C_3L_3+C_LL_3}}+C_LR_3\sqrt{\frac{1}{C_3L_3+C_LL_3}}}$ K-LP: 0 K-HP: 0 K-BP: R_3 Qz: None Wz: None

3.11 BP-11
$$Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$$

$$H(s) = \frac{L_{3}R_{3}R_{L}s}{R_{3}R_{L} + s^{2}\left(C_{3}L_{3}R_{3}R_{L} + C_{L}L_{3}R_{3}R_{L}\right) + s\left(L_{3}R_{3} + L_{3}R_{L}\right)}$$

$$\begin{array}{l} \text{Q:} \ \frac{C_{3}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}+C_{L}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}}{R_{3}+R_{L}} \\ \text{wo:} \ \sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}} \\ \text{bandwidth:} \ \frac{(R_{3}+R_{L})\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}}{C_{3}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}+C_{L}R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}+C_{L}L_{3}}}} \\ \text{K-LP:} \ 0 \\ \text{K-HP:} \ 0 \\ \text{K-BP:} \ \frac{R_{3}R_{L}}{R_{3}+R_{L}} \\ \text{Qz:} \ \text{None} \\ \text{Wz:} \ \text{None} \end{array}$$

3.12 BP-12
$$Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{L_3 L_L R_3 s}{L_3 L_L s + L_3 R_3 + L_L R_3 + s^2 \left(C_3 L_3 L_L R_3 + C_L L_3 L_L R_3 \right)}$$

Parameters:

$$\begin{array}{c} \text{Q: } C_{3}R_{3}\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} + C_{L}R_{3}\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} \\ \text{wo: } \sqrt{\frac{L_{3}+L_{L}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} \\ \text{bandwidth: } \frac{\sqrt{\frac{L_{3}+L_{L}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}}}{C_{3}R_{3}\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} + C_{L}R_{3}\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} \\ \text{K-LP: 0} \\ \text{K-HP: 0} \\ \text{K-BP: } \frac{R_{3}\sqrt{\frac{1}{C_{3}L_{L}+C_{L}L_{L}} + \frac{1}{C_{3}L_{3}+C_{L}L_{3}}}}{\sqrt{\frac{L_{3}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}} + \frac{L_{L}}{C_{3}L_{3}L_{L}+C_{L}L_{3}L_{L}}}} \\ \text{Qz: None} \\ \text{Wz: None} \end{array}$$

3.13 BP-13
$$Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)$$

$$H(s) = \frac{L_3 L_L R_3 R_L s}{L_3 R_3 R_L + L_L R_3 R_L + s^2 \left(C_3 L_3 L_L R_3 R_L + C_L L_3 L_L R_3 R_L \right) + s \left(L_3 L_L R_3 + L_3 L_L R_L \right)}$$

$$Q \colon \frac{C_3 R_3 R_L \sqrt{\frac{L_3}{C_3 L_3 L_L + C_L L_3 L_L}} + \frac{L_L}{C_3 L_3 L_L + C_L L_3 L_L}}{R_3 + R_L} + C_L R_3 R_L \sqrt{\frac{L_3}{C_3 L_3 L_L + C_L L_3 L_L}} + \frac{L_L}{C_3 L_3 L_L + C_L L_3 L_L}}$$
 wo:
$$\sqrt{\frac{L_3 + L_L}{C_3 L_3 L_L + C_L L_3 L_L}}$$
 bandwidth:
$$\frac{\sqrt{\frac{L_3 + L_L}{C_3 L_3 L_L + C_L L_3 L_L}}}{R_3 + R_L} (R_3 + R_L)$$

- 4 LP
- 5 BS
- **5.1** BS-1 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, L_L s + \frac{1}{C_L s}\right)$

Q:
$$\frac{L_L \sqrt{\frac{1}{C_L L_L}}}{R_3}$$
 wo:
$$\sqrt{\frac{1}{C_L L_L}}$$
 bandwidth:
$$\frac{R_3}{L_L}$$
 K-LP: R_3 K-HP: R_3 K-BP: 0 Qz: None Wz:
$$\sqrt{\frac{1}{C_L L_L}}$$

5.2 BS-2 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{R_L(C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1}\right)$

Parameters:

$$Q: \frac{L_{L}R_{3}\sqrt{\frac{1}{C_{L}L_{L}}} + L_{L}R_{L}\sqrt{\frac{1}{C_{L}L_{L}}}}{R_{3}R_{L}}$$
wo: $\sqrt{\frac{1}{C_{L}L_{L}}}$
bandwidth: $\frac{R_{3}R_{L}\sqrt{\frac{1}{C_{L}L_{L}}}}{L_{L}R_{3}\sqrt{\frac{1}{C_{L}L_{L}}} + L_{L}R_{L}\sqrt{\frac{1}{C_{L}L_{L}}}}$
K-LP: $\frac{R_{3}R_{L}}{R_{3}+R_{L}}$
K-HP: $\frac{R_{3}R_{L}}{R_{3}+R_{L}}$
K-BP: 0
Qz: None
Wz: $\sqrt{\frac{1}{C_{L}L_{L}}}$

5.3 BS-3 $Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, R_L\right)$

Q:
$$\frac{L_3\sqrt{\frac{1}{C_3L_3}}}{R_L}$$
 wo:
$$\sqrt{\frac{1}{C_3L_3}}$$

$$H(s) = \frac{C_L L_L R_3 s^2 + R_3}{C_L L_L s^2 + C_L R_3 s + 1}$$

$$H(s) = \frac{C_L L_L R_3 R_L s^2 + R_3 R_L}{C_L R_3 R_L s + R_3 + R_L + s^2 (C_L L_L R_3 + C_L L_L R_L)}$$

$$H(s) = \frac{C_3 L_3 R_L s^2 + R_L}{C_3 L_3 s^2 + C_3 R_L s + 1}$$

bandwidth: $\frac{R_L}{L_3}$ K-LP: R_L K-HP: R_L K-BP: 0 Qz: None Wz: $\sqrt{\frac{1}{C_3L_3}}$

5.4 BS-4
$$Z(s) = \left(\infty, \infty, \frac{R_3(C_3L_3s^2+1)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, R_L\right)$$

Parameters:

$$\begin{array}{l} \text{Q:} \ \frac{L_{3}R_{3}\sqrt{\frac{1}{C_{3}L_{3}}} + L_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}}}}{R_{3}R_{L}} \\ \text{wo:} \ \sqrt{\frac{1}{C_{3}L_{3}}} \\ \text{bandwidth:} \ \frac{R_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}}}}{L_{3}R_{3}\sqrt{\frac{1}{C_{3}L_{3}}} + L_{3}R_{L}\sqrt{\frac{1}{C_{3}L_{3}}}} \\ \text{K-LP:} \ \frac{R_{3}R_{L}}{R_{3}+R_{L}} \\ \text{K-HP:} \ \frac{R_{3}R_{L}}{R_{3}+R_{L}} \\ \text{K-BP:} \ 0 \\ \text{Qz:} \ \text{None} \\ \text{Wz:} \ \sqrt{\frac{1}{C_{3}L_{3}}} \end{array}$$

6 GE

6.1 GE-1
$$Z(s) = \left(\infty, \infty, R_3, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)$$

Parameters:

$$\begin{aligned} &\text{Q: } \frac{L_L \sqrt{\frac{1}{C_L L_L}}}{R_3 + R_L} \\ &\text{wo: } \sqrt{\frac{1}{C_L L_L}} \\ &\text{bandwidth: } \frac{R_3 + R_L}{L_L} \\ &\text{K-LP: } R_3 \\ &\text{K-HP: } R_3 \\ &\text{K-BP: } \frac{R_3 R_L}{R_3 + R_L} \\ &\text{Qz: } \frac{L_L \sqrt{\frac{1}{C_L L_L}}}{R_L} \\ &\text{Wz: } \sqrt{\frac{1}{C_L L_L}} \end{aligned}$$

6.2 GE-2 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)$

Q:
$$C_L R_3 \sqrt{\frac{1}{C_L L_L}} + C_L R_L \sqrt{\frac{1}{C_L L_L}}$$

wo: $\sqrt{\frac{1}{C_L L_L}}$
bandwidth: $\frac{\sqrt{\frac{1}{C_L L_L}}}{C_L R_3 \sqrt{\frac{1}{C_L L_L}} + C_L R_L \sqrt{\frac{1}{C_L L_L}}}$

$$H(s) = \frac{C_3 L_3 R_3 R_L s^2 + R_3 R_L}{C_3 R_3 R_L s + R_3 + R_L + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L)}$$

$$H(s) = \frac{C_L L_L R_3 s^2 + C_L R_3 R_L s + R_3}{C_L L_L s^2 + s \left(C_L R_3 + C_L R_L \right) + 1}$$

$$H(s) = \frac{C_L L_L R_3 R_L s^2 + L_L R_3 s + R_3 R_L}{L_L s + R_3 + R_L + s^2 (C_L L_L R_3 + C_L L_L R_L)}$$

K-LP:
$$\frac{R_3R_L}{R_3+R_L}$$

K-HP: $\frac{R_3R_L}{R_3+R_L}$
K-BP: R_3
Qz: $C_LR_L\sqrt{\frac{1}{C_LL_L}}$
Wz: $\sqrt{\frac{1}{C_LL_L}}$

6.3 GE-3
$$Z(s) = \left(\infty, \ \infty, \ L_3 s + R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ R_L\right)$$

$H(s) = \frac{C_3 L_3 R_L s^2 + C_3 R_3 R_L s + R_L}{C_3 L_3 s^2 + s \left(C_3 R_3 + C_3 R_L \right) + 1}$

Parameters:

$$\begin{array}{l} \text{Q:} \ \frac{L_{3}\sqrt{\frac{1}{C_{3}L_{3}}}}{R_{3}+R_{L}} \\ \text{wo:} \ \sqrt{\frac{1}{C_{3}L_{3}}} \\ \text{bandwidth:} \ \frac{R_{3}+R_{L}}{L_{3}} \\ \text{K-LP:} \ R_{L} \\ \text{K-HP:} \ R_{L} \\ \text{K-BP:} \ \frac{R_{3}R_{L}}{R_{3}+R_{L}} \\ \text{Qz:} \ \frac{L_{3}\sqrt{\frac{1}{C_{3}L_{3}}}}{R_{3}} \\ \text{Wz:} \ \sqrt{\frac{1}{C_{3}L_{3}}} \end{array}$$

6.4 GE-4
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, R_L\right)$$

$H(s) = \frac{C_3 L_3 R_3 R_L s^2 + L_3 R_L s + R_3 R_L}{L_3 s + R_3 + R_L + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L)}$

Parameters:

Q:
$$C_3 R_3 \sqrt{\frac{1}{C_3 L_3}} + C_3 R_L \sqrt{\frac{1}{C_3 L_3}}$$

wo: $\sqrt{\frac{1}{C_3 L_3}}$
bandwidth: $\frac{\sqrt{\frac{1}{C_3 L_3}}}{C_3 R_3 \sqrt{\frac{1}{C_3 L_3}} + C_3 R_L \sqrt{\frac{1}{C_3 L_3}}}$
K-LP: $\frac{R_3 R_L}{R_3 + R_L}$
K-HP: $\frac{R_3 R_L}{R_3 + R_L}$
K-BP: R_L
Qz: $C_3 R_3 \sqrt{\frac{1}{C_3 L_3}}$
Wz: $\sqrt{\frac{1}{C_3 L_3}}$

7 AP

8 INVALID-NUMER

8.1 INVALID-NUMER-1
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L R_3 R_L s + R_3}{C_3 C_L R_3 R_L s^2 + s \left(C_3 R_3 + C_L R_3 + C_L R_L\right) + 1}$$

Q:
$$\frac{C_3 C_L R_3 R_L \sqrt{\frac{1}{C_3 C_L R_3 R_L}}}{C_3 R_3 + C_L R_3 + C_L R_L}$$

wo:
$$\sqrt{\frac{1}{C_3C_LR_3R_L}}$$

K-LP: R_3 K-HP: 0

K-BP: $\frac{C_L R_3 R_L}{C_3 R_3 + C_L R_3 + C_L R_L}$ Qz: None

Wz: None

8.2 INVALID-NUMER-2 $Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$

 $H(s) = \frac{C_3 R_3 R_L s + R_L}{C_3 C_L R_3 R_L s^2 + s \left(C_3 R_3 + C_3 R_L + C_L R_L\right) + 1}$

Parameters:

Q:
$$\frac{C_3 C_L R_3 R_L \sqrt{\frac{1}{C_3 C_L R_3 R_L}}}{C_3 R_3 + C_3 R_L + C_L R_L}$$

wo: $\sqrt{\frac{1}{C_3C_LR_3R_L}}$ bandwidth: $\frac{C_3R_3+C_3R_L+C_LR_L}{C_3C_LR_3R_L}$ K-LP: R_L

K-HP: 0 K-BP: $\frac{C_3R_3R_L}{C_3R_3+C_3R_L+C_LR_L}$ Qz: None

Wz: None

INVALID-WZ

INVALID-ORDER

10.1 INVALID-ORDER-1 $Z(s) = (\infty, \infty, R_3, \infty, \infty, R_L)$

 $H(s) = \frac{R_3 R_L}{R_3 + R_L}$

10.2 INVALID-ORDER-2 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{1}{C_L s}\right)$

 $H(s) = \frac{R_3}{C_L R_3 s + 1}$

10.3 INVALID-ORDER-3 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$

 $H(s) = \frac{R_3 R_L}{C_L R_3 R_L s + R_3 + R_L}$

10.4 INVALID-ORDER-4 $Z(s) = \left(\infty, \infty, R_3, \infty, \infty, R_L + \frac{1}{C_L s}\right)$

 $H(s) = \frac{C_L R_3 R_L s + R_3}{s (C_L R_3 + C_L R_L) + 1}$

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10.5 INVALID-ORDER-5
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, R_L\right)$$

$$H(s) = \frac{R_L}{C_3 R_L s + 1}$$

10.6 INVALID-ORDER-6
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s}\right)$$

$$H(s) = \frac{1}{s(C_3 + C_L)}$$

10.7 INVALID-ORDER-7
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$$

$$H(s) = \frac{R_L}{s\left(C_3R_L + C_LR_L\right) + 1}$$

10.8 INVALID-ORDER-8
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L R_L s + 1}{C_3 C_L R_L s^2 + s (C_3 + C_L)}$$

10.9 INVALID-ORDER-9
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L L_L s^2 + 1}{C_3 C_L L_L s^3 + s (C_3 + C_L)}$$

10.10 INVALID-ORDER-10
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{L_L s}{s^2 (C_3 L_L + C_L L_L) + 1}$$

10.11 INVALID-ORDER-11
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L L_L s^2 + C_L R_L s + 1}{C_3 C_L L_L s^3 + C_3 C_L R_L s^2 + s (C_3 + C_L)}$$

10.12 INVALID-ORDER-12
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_3 C_L L_L R_L s^3 + C_3 R_L s + s^2 (C_3 L_L + C_L L_L) + 1}$$

10.13 INVALID-ORDER-13
$$Z(s) = \left(\infty, \infty, \frac{1}{C_3 s}, \infty, \infty, \frac{R_L \left(C_L L_L s^2 + 1\right)}{C_L L_L s^2 + C_L R_L s + 1}\right)$$

$$H(s) = \frac{C_L L_L R_L s^2 + R_L}{C_3 C_L L_L R_L s^3 + C_L L_L s^2 + s \left(C_3 R_L + C_L R_L \right) + 1}$$

10.14 INVALID-ORDER-14
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, R_L\right)$$

$$H(s) = \frac{R_3 R_L}{C_3 R_3 R_L s + R_3 + R_L}$$

10.15 INVALID-ORDER-15
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{1}{C_L s}\right)$$

$$H(s) = \frac{R_3}{s(C_3R_3 + C_LR_3) + 1}$$

10.16 INVALID-ORDER-16
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$$

$$H(s) = \frac{R_3 R_L}{R_3 + R_L + s \left(C_3 R_3 R_L + C_L R_3 R_L \right)}$$

10.17 INVALID-ORDER-17
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L L_L R_3 s^2 + R_3}{C_3 C_L L_L R_3 s^3 + C_L L_L s^2 + s (C_3 R_3 + C_L R_3) + 1}$$

10.18 INVALID-ORDER-18
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L L_L R_3 s^2 + C_L R_3 R_L s + R_3}{C_3 C_L L_L R_3 s^3 + s^2 \left(C_3 C_L R_3 R_L + C_L L_L \right) + s \left(C_3 R_3 + C_L R_3 + C_L R_L \right) + 1}$$

10.19 INVALID-ORDER-19
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_L L_L R_3 R_L s^2 + L_L R_3 s + R_3 R_L}{C_3 C_L L_L R_3 R_L s^3 + R_3 + R_L + s^2 \left(C_3 L_L R_3 + C_L L_L R_3 + C_L L_L R_L \right) + s \left(C_3 R_3 R_L + L_L \right)}$$

10.20 INVALID-ORDER-20
$$Z(s) = \left(\infty, \infty, \frac{R_3}{C_3 R_3 s + 1}, \infty, \infty, \frac{R_L \left(C_L L_L s^2 + 1\right)}{C_L L_L s^2 + C_L R_L s + 1}\right)$$

$$H(s) = \frac{C_L L_L R_3 R_L s^2 + R_3 R_L}{C_3 C_L L_L R_3 R_L s^3 + R_3 + R_L + s^2 \left(C_L L_L R_3 + C_L L_L R_L \right) + s \left(C_3 R_3 R_L + C_L R_3 R_L \right)}$$

10.21 INVALID-ORDER-21 $Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, R_L\right)$

$$H(s) = \frac{C_3 R_3 R_L s + R_L}{s (C_3 R_3 + C_3 R_L) + 1}$$

10.22 INVALID-ORDER-22 $Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s}\right)$

$$H(s) = \frac{C_3 R_3 s + 1}{C_3 C_L R_3 s^2 + s (C_3 + C_L)}$$

10.23 INVALID-ORDER-23 $Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s}\right)$

$$H(s) = \frac{C_3 C_L R_3 R_L s^2 + s \left(C_3 R_3 + C_L R_L \right) + 1}{s^2 \left(C_3 C_L R_3 + C_3 C_L R_L \right) + s \left(C_3 + C_L \right)}$$

10.24 INVALID-ORDER-24
$$Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3 C_L L_L R_3 s^3 + C_3 R_3 s + C_L L_L s^2 + 1}{C_3 C_L L_L s^3 + C_3 C_L R_3 s^2 + s \left(C_3 + C_L\right)}$$

10.25 INVALID-ORDER-25
$$Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_3 L_L R_3 s^2 + L_L s}{C_3 C_L L_L R_3 s^3 + C_3 R_3 s + s^2 \left(C_3 L_L + C_L L_L \right) + 1}$$

10.26 INVALID-ORDER-26
$$Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3 C_L L_L R_3 s^3 + s^2 \left(C_3 C_L R_3 R_L + C_L L_L \right) + s \left(C_3 R_3 + C_L R_L \right) + 1}{C_3 C_L L_L s^3 + s^2 \left(C_3 C_L R_3 + C_3 C_L R_L \right) + s \left(C_3 + C_L \right)}$$

10.27 INVALID-ORDER-27
$$Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)$$

$$H(s) = \frac{C_3 L_L R_3 R_L s^2 + L_L R_L s}{C_3 C_L L_L R_3 R_L s^3 + R_L + s^2 \left(C_3 L_L R_3 + C_3 L_L R_L + C_L L_L R_L \right) + s \left(C_3 R_3 R_L + L_L \right)}$$

10.28 INVALID-ORDER-28
$$Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_3 C_L L_L R_3 R_L s^3 + R_L + s^2 \left(C_3 L_L R_3 + C_L L_L R_L \right) + s \left(C_3 R_3 R_L + L_L \right)}{s^3 \left(C_3 C_L L_L R_3 + C_3 C_L L_L R_L \right) + s^2 \left(C_3 L_L + C_L L_L \right) + s \left(C_3 R_3 + C_3 R_L \right) + 1}$$

10.29 INVALID-ORDER-29
$$Z(s) = \left(\infty, \infty, R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L(C_L L_L s^2 + 1)}{C_L L_L s^2 + C_L R_L s + 1}\right)$$

$$H(s) = \frac{C_3C_LL_LR_3R_Ls^3 + C_3R_3R_Ls + C_LL_LR_Ls^2 + R_L}{s^3\left(C_3C_LL_LR_3 + C_3C_LL_LR_L\right) + s^2\left(C_3C_LR_3R_L + C_LL_L\right) + s\left(C_3R_3 + C_3R_L + C_LR_L\right) + 1}$$

10.30 INVALID-ORDER-30
$$Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3 L_3 s^2 + 1}{C_3 C_L L_3 s^3 + s (C_3 + C_L)}$$

10.31 INVALID-ORDER-31 $Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$

$$H(s) = \frac{C_3 L_3 R_L s^2 + R_L}{C_3 C_L L_3 R_L s^3 + C_3 L_3 s^2 + s \left(C_3 R_L + C_L R_L\right) + 1}$$

10.32 INVALID-ORDER-32 $Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s}\right)$

$$H(s) = \frac{C_3 C_L L_3 R_L s^3 + C_3 L_3 s^2 + C_L R_L s + 1}{C_3 C_L L_3 s^3 + C_3 C_L R_L s^2 + s (C_3 + C_L)}$$

10.33 INVALID-ORDER-33
$$Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L s^4 + s^2 (C_3 L_3 + C_L L_L) + 1}{s^3 (C_3 C_L L_3 + C_3 C_L L_L) + s (C_3 + C_L)}$$

10.34 INVALID-ORDER-34
$$Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_3 L_3 L_L s^3 + L_L s}{C_3 C_L L_3 L_L s^4 + s^2 (C_3 L_3 + C_3 L_L + C_L L_L) + 1}$$

10.35 INVALID-ORDER-35
$$Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L s^4 + C_3 C_L L_3 R_L s^3 + C_L R_L s + s^2 (C_3 L_3 + C_L L_L) + 1}{C_3 C_L R_L s^2 + s^3 (C_3 C_L L_3 + C_3 C_L L_L) + s (C_3 + C_L)}$$

10.36 INVALID-ORDER-36
$$Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)$$

$$H(s) = \frac{C_3 L_3 L_L R_L s^3 + L_L R_L s}{C_3 C_L L_3 L_L R_L s^4 + C_3 L_3 L_L s^3 + L_L s + R_L + s^2 \left(C_3 L_3 R_L + C_3 L_L R_L + C_L L_L R_L \right)}$$

10.37 INVALID-ORDER-37
$$Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L R_L s^4 + C_3 L_3 L_L s^3 + L_L s + R_L + s^2 \left(C_3 L_3 R_L + C_L L_L R_L \right)}{C_3 C_L L_3 L_L s^4 + C_3 C_L L_L R_L s^3 + C_3 R_L s + s^2 \left(C_3 L_3 + C_3 L_L + C_L L_L \right) + 1}$$

10.38 INVALID-ORDER-38
$$Z(s) = \left(\infty, \infty, L_3 s + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L \left(C_L L_L s^2 + 1\right)}{C_L L_L s^2 + C_L R_L s + 1}\right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L R_L s^4 + R_L + s^2 \left(C_3 L_3 R_L + C_L L_L R_L \right)}{C_3 C_L L_3 L_L s^4 + s^3 \left(C_3 C_L L_3 R_L + C_3 C_L L_L R_L \right) + s^2 \left(C_3 L_3 + C_L L_L \right) + s \left(C_3 R_L + C_L R_L \right) + 1}$$

10.39 INVALID-ORDER-39 $Z(s) = \left(\infty, \infty, \frac{L_{3s}}{C_3L_3s^2+1}, \infty, \infty, \frac{1}{C_Ls}\right)$

$$H(s) = \frac{L_3 s}{s^2 (C_3 L_3 + C_L L_3) + 1}$$

10.40 INVALID-ORDER-40 $Z(s) = \left(\infty, \infty, \frac{L_{3s}}{C_3L_3s^2+1}, \infty, \infty, R_L + \frac{1}{C_Ls}\right)$

$$H(s) = \frac{C_L L_3 R_L s^2 + L_3 s}{C_3 C_L L_3 R_L s^3 + C_L R_L s + s^2 (C_3 L_3 + C_L L_3) + 1}$$

10.41 INVALID-ORDER-41 $Z(s) = \left(\infty, \infty, \frac{L_3s}{C_3L_3s^2+1}, \infty, \infty, L_Ls + \frac{1}{C_Ls}\right)$

$$H(s) = \frac{C_L L_3 L_L s^3 + L_3 s}{C_3 C_L L_3 L_L s^4 + s^2 (C_3 L_3 + C_L L_3 + C_L L_L) + 1}$$

10.42 INVALID-ORDER-42 $Z(s) = \left(\infty, \infty, \frac{L_3s}{C_3L_3s^2+1}, \infty, \infty, \frac{L_Ls}{C_LL_Ls^2+1}\right)$

$$H(s) = \frac{L_3 L_L s}{L_3 + L_L + s^2 (C_3 L_3 L_L + C_L L_3 L_L)}$$

10.43 INVALID-ORDER-43 $Z(s) = \left(\infty, \infty, \frac{L_3s}{C_3L_3s^2+1}, \infty, \infty, L_Ls + R_L + \frac{1}{C_Ls}\right)$

$$H(s) = \frac{C_L L_3 L_L s^3 + C_L L_3 R_L s^2 + L_3 s}{C_3 C_L L_3 L_L s^4 + C_3 C_L L_3 R_L s^3 + C_L R_L s + s^2 (C_3 L_3 + C_L L_3 + C_L L_L) + 1}$$

10.44 INVALID-ORDER-44
$$Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_L L_3 L_L R_L s^3 + L_3 L_L s^2 + L_3 R_L s}{C_3 C_L L_3 L_L R_L s^4 + R_L + s^3 \left(C_3 L_3 L_L + C_L L_3 L_L \right) + s^2 \left(C_3 L_3 R_L + C_L L_L R_L \right) + s \left(L_3 + L_L \right)}$$

10.45 INVALID-ORDER-45
$$Z(s) = \left(\infty, \infty, \frac{L_3 s}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{R_L \left(C_L L_L s^2 + 1\right)}{C_L L_L s^2 + C_L R_L s + 1}\right)$$

$$H(s) = \frac{C_L L_3 L_L R_L s^3 + L_3 R_L s}{C_3 C_L L_3 L_L R_L s^4 + C_L L_3 L_L s^3 + L_3 s + R_L + s^2 \left(C_3 L_3 R_L + C_L L_3 R_L + C_L L_1 R_L \right)}$$

10.46 INVALID-ORDER-46
$$Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3 L_3 s^2 + C_3 R_3 s + 1}{C_3 C_L L_3 s^3 + C_3 C_L R_3 s^2 + s (C_3 + C_L)}$$

10.47 INVALID-ORDER-47
$$Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{R_L}{C_L R_L s + 1}\right)$$

$$H(s) = \frac{C_3L_3R_Ls^2 + C_3R_3R_Ls + R_L}{C_3C_LL_3R_Ls^3 + s^2\left(C_3C_LR_3R_L + C_3L_3\right) + s\left(C_3R_3 + C_3R_L + C_LR_L\right) + 1}$$

10.48 INVALID-ORDER-48
$$Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3 C_L L_3 R_L s^3 + s^2 (C_3 C_L R_3 R_L + C_3 L_3) + s (C_3 R_3 + C_L R_L) + 1}{C_3 C_L L_3 s^3 + s^2 (C_3 C_L R_3 + C_3 C_L R_L) + s (C_3 + C_L)}$$

10.49 INVALID-ORDER-49
$$Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L s^4 + C_3 C_L L_L R_3 s^3 + C_3 R_3 s + s^2 (C_3 L_3 + C_L L_L) + 1}{C_3 C_L R_3 s^2 + s^3 (C_3 C_L L_3 + C_3 C_L L_L) + s (C_3 + C_L)}$$

10.50 INVALID-ORDER-50
$$Z(s) = \left(\infty, \ \infty, \ L_3 s + R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{L_L s}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_3L_3L_Ls^3 + C_3L_LR_3s^2 + L_Ls}{C_3C_LL_3L_Ls^4 + C_3C_LL_LR_3s^3 + C_3R_3s + s^2\left(C_3L_3 + C_3L_L + C_LL_L\right) + 1}$$

10.51 INVALID-ORDER-51
$$Z(s) = \left(\infty, \ \infty, \ L_3 s + R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ L_L s + R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_3C_LL_3L_Ls^4 + s^3\left(C_3C_LL_3R_L + C_3C_LL_LR_3\right) + s^2\left(C_3C_LR_3R_L + C_3L_3 + C_LL_L\right) + s\left(C_3R_3 + C_LR_L\right) + 1}{s^3\left(C_3C_LL_3 + C_3C_LL_L\right) + s^2\left(C_3C_LR_3 + C_3C_LR_L\right) + s\left(C_3R_3 + C_LR_L\right) + s\left(C_3R_L\right) + s\left(C_3R_L\right) + s\left(C_3R_L\right) + s\left(C_2R_L\right) + s\left(C_2R_L\right) + s\left(C_2R_L\right)$$

10.52 INVALID-ORDER-52
$$Z(s) = \left(\infty, \infty, L_3 s + R_3 + \frac{1}{C_3 s}, \infty, \infty, \frac{L_L R_L s}{C_L L_L R_L s^2 + L_L s + R_L}\right)$$

$$H(s) = \frac{C_3L_3L_LR_Ls^3 + C_3L_LR_3R_Ls^2 + L_LR_Ls}{C_3C_LL_2R_Ls^4 + R_L + s^3\left(C_3C_LL_LR_3R_L + C_3L_3L_L\right) + s^2\left(C_3L_3R_L + C_3L_LR_3 + C_3L_LR_L + C_LL_LR_L\right) + s\left(C_3R_3R_L + L_L\right)}$$

$$\textbf{10.53} \quad \textbf{INVALID-ORDER-53} \ Z(s) = \left(\infty, \ \infty, \ L_3 s + R_3 + \frac{1}{C_3 s}, \ \infty, \ \infty, \ \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1} \right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L R_L s^4 + R_L + s^3 \left(C_3 C_L L_L R_3 R_L + C_3 L_3 L_L \right) + s^2 \left(C_3 L_3 R_L + C_3 L_L R_3 + C_L L_L R_L \right) + s \left(C_3 R_3 R_L + L_L \right) }{C_3 C_L L_3 L_L s^4 + s^3 \left(C_3 C_L L_L R_3 + C_3 C_L L_L R_L \right) + s^2 \left(C_3 L_3 + C_3 L_L + C_L L_L \right) + s \left(C_3 R_3 + C_3 R_L \right) + 1 }$$

10.54 INVALID-ORDER-54
$$Z(s) = \left(\infty, \ \infty, \ L_3s + R_3 + \frac{1}{C_3s}, \ \infty, \ \infty, \ \frac{R_L\left(C_LL_Ls^2 + 1\right)}{C_LL_Ls^2 + C_LR_Ls + 1}\right)$$

$$H(s) = \frac{C_3C_LL_3L_LR_2s^4 + C_3C_LL_LR_3R_Ls^3 + C_3R_3R_Ls + R_L + s^2\left(C_3L_3R_L + C_LL_LR_L\right)}{C_3C_LL_3L_Ls^4 + s^3\left(C_3C_LL_3R_L + C_3C_LL_LR_3 + C_3C_LL_LR_L\right) + s^2\left(C_3C_LR_3R_L + C_3L_L\right) + s\left(C_3R_3 + C_3R_L + C_LR_L\right) + 1}$$

10.55 INVALID-ORDER-55
$$Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L L_3 R_3 R_L s^2 + L_3 R_3 s}{C_3 C_L L_3 R_3 R_L s^3 + R_3 + s^2 \left(C_3 L_3 R_3 + C_L L_3 R_3 + C_L L_3 R_L \right) + s \left(C_L R_3 R_L + L_3 \right)}$$

10.56 INVALID-ORDER-56
$$Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, L_L s + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L L_3 L_L R_3 s^3 + L_3 R_3 s}{C_3 C_L L_3 L_L R_3 s^4 + C_L L_3 L_L s^3 + L_3 s + R_3 + s^2 \left(C_3 L_3 R_3 + C_L L_3 R_3 + C_L L_L R_3 \right)}$$

10.57 INVALID-ORDER-57
$$Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, L_L s + R_L + \frac{1}{C_L s}\right)$$

$$H(s) = \frac{C_L L_3 L_L R_3 s^3 + C_L L_3 R_3 R_L s^2 + L_3 R_3 s}{C_3 C_L L_3 L_L R_3 s^4 + R_3 + s^3 \left(C_3 C_L L_3 R_3 R_L + C_L L_3 L_L \right) + s^2 \left(C_3 L_3 R_3 + C_L L_3 R_3 + C_L L_3 R_4 + C_L L_4 R_3 \right) + s \left(C_L R_3 R_L + L_3 \right)}$$

10.58 INVALID-ORDER-58
$$Z(s) = \left(\infty, \ \infty, \ \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \ \infty, \ \infty, \ \frac{C_L L_L R_L s^2 + L_L s + R_L}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_L L_3 L_L R_3 R_L s^3 + L_3 L_L R_3 s^2 + L_3 R_3 R_L s}{C_3 C_L L_3 L_L R_3 R_L s^4 + R_3 R_L + s^3 \left(C_3 L_3 L_L R_3 + C_L L_3 L_L R_3 + C_L L_3 L_L R_L \right) + s^2 \left(C_3 L_3 R_3 R_L + C_L L_L R_3 R_L + L_3 L_L \right) + s \left(L_3 R_3 + L_3 R_L + L_L R_3 \right)}$$

10.59 INVALID-ORDER-59
$$Z(s) = \left(\infty, \infty, \frac{L_3 R_3 s}{C_3 L_3 R_3 s^2 + L_3 s + R_3}, \infty, \infty, \frac{R_L \left(C_L L_L s^2 + 1\right)}{C_L L_L s^2 + C_L R_L s + 1}\right)$$

$$H(s) = \frac{C_L L_3 L_L R_3 R_L s^3 + L_3 R_3 R_L s}{C_3 C_L L_3 L_L R_3 R_L s^4 + R_3 R_L + s^3 \left(C_L L_3 L_L R_3 + C_L L_3 L_L R_L \right) + s^2 \left(C_3 L_3 R_3 R_L + C_L L_3 R_3 R_L + C_L L_L R_3 R_L \right) + s \left(L_3 R_3 + L_3 R_L \right)}$$

10.60 INVALID-ORDER-60
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, \frac{1}{C_Ls}\right)$$

$$H(s) = \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_3 C_L L_3 R_3 s^3 + C_L R_3 s + s^2 (C_3 L_3 + C_L L_3) + 1}$$

10.61 INVALID-ORDER-61
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, \frac{R_L}{C_LR_Ls + 1}\right)$$

$$H(s) = \frac{C_3 L_3 R_3 R_L s^2 + L_3 R_L s + R_3 R_L}{C_3 C_L L_3 R_3 R_L s^3 + R_3 + R_L + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L + C_L L_3 R_L) + s (C_L R_3 R_L + L_3)}$$

10.62 INVALID-ORDER-62
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, R_L + \frac{1}{C_Ls}\right)$$

$$H(s) = \frac{C_3 C_L L_3 R_3 R_L s^3 + R_3 + s^2 \left(C_3 L_3 R_3 + C_L L_3 R_L \right) + s \left(C_L R_3 R_L + L_3 \right)}{s^3 \left(C_3 C_L L_3 R_3 + C_3 C_L L_3 R_L \right) + s^2 \left(C_3 L_3 + C_L L_3 \right) + s \left(C_L R_3 + C_L R_L \right) + 1}$$

10.63 INVALID-ORDER-63
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, L_Ls + \frac{1}{C_Ls}\right)$$

$$H(s) = \frac{C_3 C_L L_3 L_L R_3 s^4 + C_L L_3 L_L s^3 + L_3 s + R_3 + s^2 \left(C_3 L_3 R_3 + C_L L_L R_3\right)}{C_3 C_L L_3 L_L s^4 + C_3 C_L L_3 R_3 s^3 + C_L R_3 s + s^2 \left(C_3 L_3 + C_L L_3 + C_L L_1\right) + 1}$$

10.64 INVALID-ORDER-64
$$Z(s) = \left(\infty, \infty, \frac{C_3 L_3 R_3 s^2 + L_3 s + R_3}{C_3 L_3 s^2 + 1}, \infty, \infty, \frac{L_L s}{C_L L_L s^2 + 1}\right)$$

$$H(s) = \frac{C_3 L_3 L_L R_3 s^3 + L_3 L_L s^2 + L_L R_3 s}{C_3 C_L L_3 L_L R_3 s^4 + R_3 + s^3 \left(C_3 L_3 L_L + C_L L_3 L_L \right) + s^2 \left(C_3 L_3 R_3 + C_L L_L R_3 \right) + s \left(L_3 + L_L \right)}$$

10.65 INVALID-ORDER-65
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, L_Ls + R_L + \frac{1}{C_Ls}\right)$$

$$H(s) = \frac{C_3C_LL_3L_LR_3s^4 + R_3 + s^3\left(C_3C_LL_3R_3R_L + C_LL_3L_L\right) + s^2\left(C_3L_3R_3 + C_LL_3R_L + C_LL_LR_3\right) + s\left(C_LR_3R_L + L_3\right)}{C_3C_LL_3L_Ls^4 + s^3\left(C_3C_LL_3R_3 + C_3C_LL_3R_L\right) + s^2\left(C_3L_3R_3 + C_LL_3 + C_LL_1\right) + s\left(C_LR_3 + C_LR_L\right) + 1}$$

10.66 INVALID-ORDER-66
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, \frac{L_LR_Ls}{C_LL_LR_Ls^2 + L_Ls + R_L}\right)$$

$$H(s) = \frac{C_3L_3L_LR_3R_Ls^3 + L_3L_LR_2s^2 + L_LR_3R_Ls}{C_3C_LL_3L_LR_3R_Ls^4 + R_3R_L + s^3\left(C_3L_3L_LR_3 + C_3L_3L_LR_L + C_LL_3L_LR_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_LR_3R_L + L_3L_L\right) + s\left(L_3R_L + L_LR_3 + L_LR_L\right)}$$

10.67 INVALID-ORDER-67
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, \frac{C_LL_LR_Ls^2 + L_Ls + R_L}{C_LL_Ls^2 + 1}\right)$$

$$H(s) = \frac{C_3C_LL_3L_LR_3R_Ls^4 + R_3R_L + s^3\left(C_3L_3L_LR_3 + C_LL_3L_LR_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_LR_3R_L + L_3L_L\right) + s\left(L_3R_L + L_LR_3\right)}{R_3 + R_L + s^4\left(C_3C_LL_3L_LR_3 + C_3C_LL_3L_LR_L\right) + s^3\left(C_3L_3L_LR_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_LR_3R_L + L_3L_L\right) + s\left(L_3R_L + L_LR_3\right)}$$

10.68 INVALID-ORDER-68
$$Z(s) = \left(\infty, \infty, \frac{C_3L_3R_3s^2 + L_3s + R_3}{C_3L_3s^2 + 1}, \infty, \infty, \infty, \frac{R_L(C_LL_Ls^2 + 1)}{C_LL_Ls^2 + C_LR_Ls + 1}\right)$$

$$H(s) = \frac{C_3C_LL_3L_LR_3R_Ls^4 + C_LL_3L_LR_Ls^3 + L_3R_Ls + R_3R_L + s^2\left(C_3L_3R_3R_L + C_LL_LR_3R_L\right)}{R_3 + R_L + s^4\left(C_3C_LL_3L_LR_3 + C_3C_LL_3L_LR_L\right) + s^3\left(C_3C_LL_3R_3R_L + C_LL_3L_L\right) + s^2\left(C_3L_3R_3 + C_3L_3R_L + C_LL_2R_3 + C_LL_2R_3 + C_LL_2R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L + C_LL_3R_L\right) + s^2\left(C_3L_3R_3R_L + C_LL_3R_L +$$

10.69 INVALID-ORDER-69
$$Z(s) = \left(\infty, \infty, \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \frac{1}{C_Ls}\right)$$

$$H(s) = \frac{C_3 L_3 R_3 s^2 + R_3}{C_3 C_L L_3 R_3 s^3 + C_3 L_3 s^2 + s \left(C_3 R_3 + C_L R_3\right) + 1}$$

10.70 INVALID-ORDER-70
$$Z(s) = \left(\infty, \infty, \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \infty, \infty, \infty, \frac{R_L}{C_LR_Ls+1}\right)$$

$$H(s) = \frac{C_3 L_3 R_3 R_L s^2 + R_3 R_L}{C_3 C_L L_3 R_3 R_L s^3 + R_3 + R_L + s^2 (C_3 L_3 R_3 + C_3 L_3 R_L) + s (C_3 R_3 R_L + C_L R_3 R_L)}$$

10.71 INVALID-ORDER-71
$$Z(s) = \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ R_L + \frac{1}{C_Ls}\right)$$

$$H(s) = \frac{C_3C_LL_3R_3R_Ls^3 + C_3L_3R_3s^2 + C_LR_3R_Ls + R_3}{s^3\left(C_3C_LL_3R_3 + C_3C_LL_3R_3\right) + s^2\left(C_3C_LR_3R_L + C_3L_3\right) + s\left(C_3R_3 + C_LR_3 + C_LR_3\right) + 1}$$

$$\textbf{10.72} \quad \textbf{INVALID-ORDER-72} \ \ Z(s) = \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ L_Ls + \frac{1}{C_Ls} \right)$$

$$H(s) = \frac{C_3C_LL_3L_LR_3s^4 + R_3 + s^2\left(C_3L_3R_3 + C_LL_LR_3\right)}{C_3C_LL_3L_Ls^4 + s^3\left(C_3C_LL_3R_3 + C_3C_LL_LR_3\right) + s^2\left(C_3L_3 + C_LL_L\right) + s\left(C_3R_3 + C_LR_3\right) + 1}$$

10.73 INVALID-ORDER-73
$$Z(s) = \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ \frac{L_Ls}{C_LL_Ls^2+1}\right)$$

$$H(s) = \frac{C_3L_3L_LR_3s^3 + L_LR_3s}{C_3C_LL_3L_LR_3s^4 + C_3L_3L_Ls^3 + L_Ls + R_3 + s^2\left(C_3L_3R_3 + C_3L_LR_3 + C_LL_LR_3\right)}$$

$$\begin{aligned} \textbf{10.74} \quad \textbf{INVALID-ORDER-74} \ \ Z(s) &= \left(\infty, \ \ \infty, \ \ \frac{R_3\left(C_3L_3s^2 + 1\right)}{C_3L_3s^2 + C_3R_3s + 1}, \ \ \infty, \ \ \infty, \ \ L_Ls + R_L + \frac{1}{C_Ls} \right) \\ & H(s) &= \frac{C_3C_LL_3L_LR_3s^4 + C_3C_LL_3R_3R_Ls^3 + C_LR_3R_Ls + R_3 + s^2\left(C_3L_3R_3 + C_LL_LR_3\right)}{C_3C_LL_3L_Ls^4 + s^3\left(C_3C_LL_3R_3 + C_3C_LL_3R_4 + C_3C_LL_R\right) + s^2\left(C_3C_LR_3R_L + C_3L_3 + C_LL_L\right) + s\left(C_3R_3 + C_LR_3 + C_LR_4\right) + 1} \end{aligned}$$

10.75 INVALID-ORDER-75
$$Z(s) = \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3S^2+C_3R_3s+1}, \ \infty, \ \infty, \ \frac{L_LR_Ls}{C_LL_LR_Ls^2+L_Ls+R_L}\right)$$

$$H(s) = \frac{C_3L_3L_LR_3R_Ls^3 + L_LR_3R_Ls}{C_3C_LL_3L_LR_3R_Ls^4 + R_3R_L + s^3\left(C_3L_3L_LR_3 + C_3L_3L_LR_3\right) + s^2\left(C_3L_3R_3R_L + C_3L_LR_3R_L\right) + s\left(L_LR_3R_L\right) + s\left(L_LR_3R_L\right)}$$

$$\textbf{10.76} \quad \textbf{INVALID-ORDER-76} \ \ Z(s) = \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ \frac{C_LL_LR_Ls^2+L_Ls+R_L}{C_LL_Ls^2+1} \right) \\ H(s) = \frac{C_3C_LL_3L_LR_3R_Ls^4 + C_3L_3L_LR_3s^3 + L_LR_3s + R_3R_L + s^2\left(C_3L_3R_3R_L + C_LL_LR_3R_L\right)}{R_3 + R_L + s^4\left(C_3C_LL_3L_LR_3 + C_3C_LL_3L_LR_L\right) + s^3\left(C_3C_LL_RR_3R_L + C_3L_3L_L\right) + s^2\left(C_3L_3R_3 + C_3L_RR_3 + C_LL_RR_3 + C_LL_RR_1\right) + s\left(C_3R_3R_L + L_L\right)}$$

10.77 INVALID-ORDER-77
$$Z(s) = \left(\infty, \ \infty, \ \frac{R_3\left(C_3L_3s^2+1\right)}{C_3L_3s^2+C_3R_3s+1}, \ \infty, \ \infty, \ \frac{R_L\left(C_LL_Ls^2+1\right)}{C_LL_Ls^2+C_LR_Ls+1}\right)$$

$$H(s) = \frac{C_3C_LL_3L_LR_3R_Ls^4 + R_3R_L + s^2\left(C_3L_3R_3R_L + C_LL_LR_3R_L\right)}{R_3 + R_L + s^4\left(C_3C_LL_3L_LR_3 + C_3C_LL_3L_LR_L\right) + s^3\left(C_3C_LL_3R_3R_L + C_3C_LL_LR_3R_L\right) + s^2\left(C_3L_3R_3 + C_3L_3R_3 + C_3L_3R_4 + C_4L_4R_3\right) + s^2\left(C_3L_3R_3 + C_3L_3R_4 + C_4L_4R_3 + C_4L_4R_4\right) + s^2\left(C_3R_3R_4 + C_4R_4\right) + s^2\left(C_3R_3R_4 + C_4R_4\right) + s^2\left(C_3R_3R_4 + C_4R_4\right) + s^2\left(C_3R_4R_4 + C_4R_4\right) + s^2\left(C_4R_4R_4 + C_4R_4\right) + s^2\left(C_4R_4R_4 + C_4R_4\right) + s^2\left(C_4R_4 + C_4R_4\right) + s^2\left(C_4$$

11 PolynomialError