Filter Summary Report: CG,TIA,simple,Z2,Z4

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Contents

1 Examined $H(z)$ for CG TIA simple Z2 Z4: $\frac{Z_4(Z_2g_m+1)}{2Z_2g_m+2}$

$$H(z) = \frac{Z_4\left(Z_2g_m + 1\right)}{2Z_2g_m + 2}$$

2 HP

3 BP

3.1 BP-1 $Z(s) = \left(\infty, \ R_2, \ \infty, \ \frac{L_4R_4s}{C_4L_4R_4s^2+L_4s+R_4}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4R_4s}{2C_4L_4R_4s^2 + 2L_4s + 2R_4}$$

Parameters:

Q: $C_4R_4\sqrt{\frac{1}{C_4L_4}}$

wo: $\sqrt{\frac{1}{C_4L_4}}$

bandwidth: $\frac{1}{C_4R_4}$

K-LP: 0

K-HP: 0

K-BP: $\frac{R_4}{2}$

Qz: 0

Wz: None

3.2 BP-2 $Z(s) = \left(\infty, \ \frac{1}{C_2s}, \ \infty, \ \frac{L_4R_4s}{C_4L_4R_4s^2+L_4s+R_4}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4R_4s}{2C_4L_4R_4s^2 + 2L_4s + 2R_4}$$

Parameters:

Q: $C_4R_4\sqrt{\frac{1}{C_4L_4}}$

wo: $\sqrt{\frac{1}{C_4L_4}}$

bandwidth: $\frac{1}{C_4R_4}$

K-LP: 0

K-HP: 0

K-BP: $\frac{R_4}{2}$

Qz: 0

Wz: None

3.3 BP-3 $Z(s) = \left(\infty, \ \frac{R_2}{C_2R_2s+1}, \ \infty, \ \frac{L_4R_4s}{C_4L_4R_4s^2+L_4s+R_4}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4R_4s}{2C_4L_4R_4s^2 + 2L_4s + 2R_4}$$

Parameters:

Q: $C_4R_4\sqrt{\frac{1}{C_4L_4}}$

wo: $\sqrt{\frac{1}{C_4L_4}}$

bandwidth: $\frac{1}{C_4R_4}$

K-LP: 0

K-HP: 0

K-BP: $\frac{R_4}{2}$

Qz: 0

Wz: None

3.4 **BP-4** $Z(s) = \left(\infty, \ R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 R_4 s}{C_4 L_4 R_4 s^2 + L_4 s + R_4}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4 R_4 s}{2 C_4 L_4 R_4 s^2 + 2 L_4 s + 2 R_4}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{1}{C_4 R_4}$

K-LP: 0

K-HP: 0

K-BP: $\frac{R_4}{2}$

Qz: 0

Wz: None

3.5 **BP-5** $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 R_4 s}{C_4 L_4 R_4 s^2 + L_4 s + R_4}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4 R_4 s}{2 C_4 L_4 R_4 s^2 + 2 L_4 s + 2 R_4}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{1}{C_4 R_4}$

K-LP: 0

K-HP: 0

K-BP: $\frac{R_4}{2}$

Qz: 0

Wz: None

3.6 **BP-6** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 R_4 s}{C_4 L_4 R_4 s^2 + L_4 s + R_4}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4 R_4 s}{2 C_4 L_4 R_4 s^2 + 2 L_4 s + 2 R_4}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{1}{C_4 R_4}$

K-LP: 0

K-HP: 0

K-BP: $\frac{R_4}{2}$

Qz: 0

Wz: None

3.7 **BP-7** $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ \frac{L_4 R_4 s}{C_4 L_4 R_4 s^2 + L_4 s + R_4}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4 R_4 s}{2 C_4 L_4 R_4 s^2 + 2 L_4 s + 2 R_4}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{1}{C_4 R_4}$

K-LP: 0
K-HP: 0
K-BP: $\frac{R_4}{2}$
Qz: 0
Wz: None

3.8 **BP-8** $Z(s) = \left(\infty, \ \frac{R_2\left(C_2L_2s^2+1\right)}{C_2L_2s^2+C_2R_2s+1}, \ \infty, \ \frac{L_4R_4s}{C_4L_4R_4s^2+L_4s+R_4}, \ \infty, \ \infty \right)$

$$H(s) = \frac{L_4R_4s}{2C_4L_4R_4s^2 + 2L_4s + 2R_4}$$

Parameters:

Q: $C_4R_4\sqrt{\frac{1}{C_4L_4}}$

wo: $\sqrt{\frac{1}{C_4L_4}}$

bandwidth: $\frac{1}{C_4R_4}$

K-LP: 0
K-HP: 0
K-BP: $\frac{R_4}{2}$
Qz: 0
Wz: None

4 LP

5 BS

5.1 **BS-1** $Z(s) = \left(\infty, \ R_2, \ \infty, \ \frac{R_4\left(C_4L_4s^2+1\right)}{C_4L_4s^2+C_4R_4s+1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4L_4R_4s^2 + R_4}{2C_4L_4s^2 + 2C_4R_4s + 2}$$

Parameters:

Q: $\frac{L_4\sqrt{\frac{1}{C_4L_4}}}{R_4}$

wo: $\sqrt{\frac{1}{C_4L_4}}$

bandwidth: $\frac{R_4}{L_4}$

K-LP: $\frac{R_4}{2}$
K-HP: $\frac{R_4}{2}$
K-BP: 0
Qz: None
Wz: $\sqrt{\frac{1}{C_4L_4}}$

5.2 **BS-2** $Z(s) = \left(\infty, \ \frac{1}{C_2s}, \ \infty, \ \frac{R_4\left(C_4L_4s^2+1\right)}{C_4L_4s^2+C_4R_4s+1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4L_4R_4s^2 + R_4}{2C_4L_4s^2 + 2C_4R_4s + 2}$$

Parameters:

Q: $\frac{L_4\sqrt{\frac{1}{C_4L_4}}}{R_4}$

wo: $\sqrt{\frac{1}{C_4L_4}}$

bandwidth: $\frac{R_4}{L_4}$

K-LP: $\frac{R_4}{2}$

K-HP: $\frac{R_4}{2}$
K-BP: 0
Qz: None
Wz: $\sqrt{\frac{1}{C_4 L_4}}$

5.3 BS-3 $Z(s) = \left(\infty, \ \frac{R_2}{C_2 R_2 s + 1}, \ \infty, \ \frac{R_4 \left(C_4 L_4 s^2 + 1 \right)}{C_4 L_4 s^2 + C_4 R_4 s + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + R_4}{2 C_4 L_4 s^2 + 2 C_4 R_4 s + 2}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{R_4}{L_4}$

K-LP: $\frac{R_4}{2}$

K-HP: $\frac{R_4}{2}$

K-BP: 0

Qz: None

Wz: $\sqrt{\frac{1}{C_4 L_4}}$

5.4 BS-4 $Z(s) = \left(\infty, \ R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{R_4 \left(C_4 L_4 s^2 + 1 \right)}{C_4 L_4 s^2 + C_4 R_4 s + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + R_4}{2 C_4 L_4 s^2 + 2 C_4 R_4 s + 2}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{R_4}{L_4}$

K-LP: $\frac{R_4}{2}$

K-HP: $\frac{R_4}{2}$

K-BP: 0

Qz: None

Wz: $\sqrt{\frac{1}{C_4 L_4}}$

5.5 BS-5 $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ \frac{R_4 \left(C_4 L_4 s^2 + 1 \right)}{C_4 L_4 s^2 + C_4 R_4 s + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + R_4}{2 C_4 L_4 s^2 + 2 C_4 R_4 s + 2}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{R_4}{L_4}$

K-LP: $\frac{R_4}{2}$

K-HP: $\frac{R_4}{2}$

K-BP: 0

Qz: None

Wz: $\sqrt{\frac{1}{C_4 L_4}}$

5.6 BS-6 $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{R_4\left(C_4 L_4 s^2 + 1\right)}{C_4 L_4 s^2 + C_4 R_4 s + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + R_4}{2 C_4 L_4 s^2 + 2 C_4 R_4 s + 2}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{R_4}{L_4}$

K-LP: $\frac{R_4}{2}$

K-HP: $\frac{R_4}{2}$

K-BP: 0

Qz: None

Wz: $\sqrt{\frac{1}{C_4 L_4}}$

5.7 BS-7 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ \frac{R_4\left(C_4 L_4 s^2 + 1\right)}{C_4 L_4 s^2 + C_4 R_4 s + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + R_4}{2 C_4 L_4 s^2 + 2 C_4 R_4 s + 2}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{R_4}{L_4}$

K-LP: $\frac{R_4}{2}$

K-HP: $\frac{R_4}{2}$

K-BP: 0

Qz: None

Wz: $\sqrt{\frac{1}{C_4 L_4}}$

5.8 BS-8 $Z(s) = \left(\infty, \ \frac{R_2\left(C_2 L_2 s^2 + 1\right)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \ \infty, \ \frac{R_4\left(C_4 L_4 s^2 + 1\right)}{C_4 L_4 s^2 + C_4 R_4 s + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + R_4}{2 C_4 L_4 s^2 + 2 C_4 R_4 s + 2}$$

Parameters:

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

wo: $\sqrt{\frac{1}{C_4 L_4}}$

bandwidth: $\frac{R_4}{L_4}$

K-LP: $\frac{R_4}{2}$

K-HP: $\frac{R_4}{2}$

K-BP: 0

Qz: None

Wz: $\sqrt{\frac{1}{C_4 L_4}}$

6 GE

7 AP

8 INVALID-NUMER

9 INVALID-WZ

10 INVALID-ORDER

10.1 INVALID-ORDER-1 $Z(s) = (\infty, \; R_2, \; \infty, \; R_4, \; \infty, \; \infty)$

$$H(s) = \frac{R_4}{2}$$

10.2 INVALID-ORDER-2 $Z(s) = \left(\infty, \; R_2, \; \infty, \; \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{1}{2C_4 s}$$

10.3 INVALID-ORDER-3 $Z(s) = \left(\infty, \; R_2, \; \infty, \; \frac{R_4}{C_4 R_4 s + 1}, \; \infty, \; \infty\right)$

$$H(s) = \frac{R_4}{2C_4 R_4 s + 2}$$

10.4 INVALID-ORDER-4 $Z(s) = \left(\infty, \; R_2, \; \infty, \; R_4 + \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 R_4 s + 1}{2C_4 s}$$

10.5 INVALID-ORDER-5 $Z(s) = \left(\infty, \; R_2, \; \infty, \; L_4 s + \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + 1}{2C_4 s}$$

10.6 INVALID-ORDER-6 $Z(s) = \left(\infty, \; R_2, \; \infty, \; \frac{L_4 s}{C_4 L_4 s^2 + 1}, \; \infty, \; \infty\right)$

$$H(s) = \frac{L_4 s}{2C_4 L_4 s^2 + 2}$$

10.7 INVALID-ORDER-7 $Z(s) = \left(\infty, \; R_2, \; \infty, \; L_4 s + R_4 + \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + C_4 R_4 s + 1}{2C_4 s}$$

10.8 INVALID-ORDER-8 $Z(s) = \left(\infty, \; R_2, \; \infty, \; \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + L_4 s + R_4}{2C_4 L_4 s^2 + 2}$$

10.9 **INVALID-ORDER-9** $Z(s) = \left(\infty, \ \frac{1}{C_2 s}, \ \infty, \ R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{R_4}{2}$$

10.10 **INVALID-ORDER-10** $Z(s) = \left(\infty, \ \frac{1}{C_2 s}, \ \infty, \ \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{1}{2C_4 s}$$

10.11 **INVALID-ORDER-11** $Z(s) = \left(\infty, \ \frac{1}{C_2 s}, \ \infty, \ \frac{R_4}{C_4 R_4 s + 1}, \ \infty, \ \infty\right)$

$$H(s) = \frac{R_4}{2C_4 R_4 s + 2}$$

10.12 **INVALID-ORDER-12** $Z(s) = \left(\infty, \ \frac{1}{C_2 s}, \ \infty, \ R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 R_4 s + 1}{2C_4 s}$$

10.13 **INVALID-ORDER-13** $Z(s) = \left(\infty, \ \frac{1}{C_2 s}, \ \infty, \ L_4 s + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + 1}{2C_4 s}$$

10.14 **INVALID-ORDER-14** $Z(s) = \left(\infty, \ \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4 s}{2C_4 L_4 s^2 + 2}$$

10.15 **INVALID-ORDER-15** $Z(s) = \left(\infty, \ \frac{1}{C_2 s}, \ \infty, \ L_4 s + R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + C_4 R_4 s + 1}{2C_4 s}$$

10.16 **INVALID-ORDER-16** $Z(s) = \left(\infty, \ \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + L_4 s + R_4}{2C_4 L_4 s^2 + 2}$$

10.17 **INVALID-ORDER-17** $Z(s) = \left(\infty, \ \frac{R_2}{C_2 R_2 s + 1}, \ \infty, \ R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{R_4}{2}$$

10.18 **INVALID-ORDER-18** $Z(s) = \left(\infty, \ \frac{R_2}{C_2 R_2 s + 1}, \ \infty, \ \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{1}{2C_4 s}$$

10.19 **INVALID-ORDER-19** $Z(s) = \left(\infty, \; \frac{R_2}{C_2 R_2 s + 1}, \; \infty, \; \frac{R_4}{C_4 R_4 s + 1}, \; \infty, \; \infty\right)$

$$H(s) = \frac{R_4}{2C_4 R_4 s + 2}$$

10.20 **INVALID-ORDER-20** $Z(s) = \left(\infty, \; \frac{R_2}{C_2 R_2 s + 1}, \; \infty, \; R_4 + \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 R_4 s + 1}{2C_4 s}$$

10.21 **INVALID-ORDER-21** $Z(s) = \left(\infty, \; \frac{R_2}{C_2 R_2 s + 1}, \; \infty, \; L_4 s + \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + 1}{2C_4 s}$$

10.22 **INVALID-ORDER-22** $Z(s) = \left(\infty, \; \frac{R_2}{C_2 R_2 s + 1}, \; \infty, \; \frac{L_4 s}{C_4 L_4 s^2 + 1}, \; \infty, \; \infty\right)$

$$H(s) = \frac{L_4 s}{2C_4 L_4 s^2 + 2}$$

10.23 **INVALID-ORDER-23** $Z(s) = \left(\infty, \; \frac{R_2}{C_2 R_2 s + 1}, \; \infty, \; L_4 s + R_4 + \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + C_4 R_4 s + 1}{2C_4 s}$$

10.24 **INVALID-ORDER-24** $Z(s) = \left(\infty, \; \frac{R_2}{C_2 R_2 s + 1}, \; \infty, \; \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + L_4 s + R_4}{2C_4 L_4 s^2 + 2}$$

10.25 **INVALID-ORDER-25** $Z(s) = \left(\infty, \; R_2 + \frac{1}{C_2 s}, \; \infty, \; R_4, \; \infty, \; \infty\right)$

$$H(s) = \frac{R_4}{2}$$

10.26 **INVALID-ORDER-26** $Z(s) = \left(\infty, \; R_2 + \frac{1}{C_2 s}, \; \infty, \; \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{1}{2C_4 s}$$

10.27 **INVALID-ORDER-27** $Z(s) = \left(\infty, \; R_2 + \frac{1}{C_2 s}, \; \infty, \; \frac{R_4}{C_4 R_4 s + 1}, \; \infty, \; \infty\right)$

$$H(s) = \frac{R_4}{2C_4 R_4 s + 2}$$

10.28 **INVALID-ORDER-28** $Z(s) = \left(\infty, \; R_2 + \frac{1}{C_2 s}, \; \infty, \; R_4 + \frac{1}{C_4 s}, \; \infty, \; \infty\right)$

$$H(s) = \frac{C_4 R_4 s + 1}{2C_4 s}$$

10.29 INVALID-ORDER-29 $Z(s) = \left(\infty, \ R_2 + \frac{1}{C_2 s}, \ \infty, \ L_4 s + \frac{1}{C_4 s}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 s^2 + 1}{2 C_4 s}$$

10.30 INVALID-ORDER-30 $Z(s) = \left(\infty, \ R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{L_4 s}{2 C_4 L_4 s^2 + 2}$$

10.31 INVALID-ORDER-31 $Z(s) = \left(\infty, \ R_2 + \frac{1}{C_2 s}, \ \infty, \ L_4 s + R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 s^2 + C_4 R_4 s + 1}{2 C_4 s}$$

10.32 INVALID-ORDER-32 $Z(s) = \left(\infty, \ R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + L_4 s + R_4}{2 C_4 L_4 s^2 + 2}$$

10.33 INVALID-ORDER-33 $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ R_4, \ \infty, \ \infty \right)$

$$H(s) = \frac{R_4}{2}$$

10.34 INVALID-ORDER-34 $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ \frac{1}{C_4 s}, \ \infty, \ \infty \right)$

$$H(s) = \frac{1}{2 C_4 s}$$

10.35 INVALID-ORDER-35 $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ \frac{R_4}{C_4 R_4 s + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{R_4}{2 C_4 R_4 s + 2}$$

10.36 INVALID-ORDER-36 $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 R_4 s + 1}{2 C_4 s}$$

10.37 INVALID-ORDER-37 $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ L_4 s + \frac{1}{C_4 s}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4 L_4 s^2 + 1}{2 C_4 s}$$

10.38 INVALID-ORDER-38 $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{L_4 s}{2 C_4 L_4 s^2 + 2}$$

10.39 **INVALID-ORDER-39** $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ L_4 s + R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + C_4 R_4 s + 1}{2 C_4 s}$$

10.40 **INVALID-ORDER-40** $Z(s) = \left(\infty, \ L_2 s + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + L_4 s + R_4}{2 C_4 L_4 s^2 + 2}$$

10.41 **INVALID-ORDER-41** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{R_4}{2}$$

10.42 **INVALID-ORDER-42** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{1}{2 C_4 s}$$

10.43 **INVALID-ORDER-43** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{R_4}{C_4 R_4 s + 1}, \ \infty, \ \infty\right)$

$$H(s) = \frac{R_4}{2 C_4 R_4 s + 2}$$

10.44 **INVALID-ORDER-44** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 R_4 s + 1}{2 C_4 s}$$

10.45 **INVALID-ORDER-45** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ L_4 s + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + 1}{2 C_4 s}$$

10.46 **INVALID-ORDER-46** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4 s}{2 C_4 L_4 s^2 + 2}$$

10.47 **INVALID-ORDER-47** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ L_4 s + R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + C_4 R_4 s + 1}{2 C_4 s}$$

10.48 **INVALID-ORDER-48** $Z(s) = \left(\infty, \ L_2 s + R_2 + \frac{1}{C_2 s}, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + L_4 s + R_4}{2 C_4 L_4 s^2 + 2}$$

10.49   INVALID-ORDER-49 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{R_4}{2}$$

10.50   INVALID-ORDER-50 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{1}{2C_4 s}$$

10.51   INVALID-ORDER-51 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ \frac{R_4}{C_4 R_4 s + 1}, \ \infty, \ \infty\right)$

$$H(s) = \frac{R_4}{2C_4 R_4 s + 2}$$

10.52   INVALID-ORDER-52 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 R_4 s + 1}{2C_4 s}$$

10.53   INVALID-ORDER-53 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ L_4 s + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + 1}{2C_4 s}$$

10.54   INVALID-ORDER-54 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1}, \ \infty, \ \infty\right)$

$$H(s) = \frac{L_4 s}{2C_4 L_4 s^2 + 2}$$

10.55   INVALID-ORDER-55 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ L_4 s + R_4 + \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 s^2 + C_4 R_4 s + 1}{2C_4 s}$$

10.56   INVALID-ORDER-56 $Z(s) = \left(\infty, \ \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \ \infty, \ \frac{L_4 s}{C_4 L_4 s^2 + 1} + R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{C_4 L_4 R_4 s^2 + L_4 s + R_4}{2C_4 L_4 s^2 + 2}$$

10.57   INVALID-ORDER-57 $Z(s) = \left(\infty, \ \frac{R_2\left(C_2 L_2 s^2 + 1\right)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \ \infty, \ R_4, \ \infty, \ \infty\right)$

$$H(s) = \frac{R_4}{2}$$

10.58   INVALID-ORDER-58 $Z(s) = \left(\infty, \ \frac{R_2\left(C_2 L_2 s^2 + 1\right)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \ \infty, \ \frac{1}{C_4 s}, \ \infty, \ \infty\right)$

$$H(s) = \frac{1}{2C_4 s}$$

10.59 INVALID-ORDER-59 $Z(s) = \left(\infty, \ \dfrac{R_2\left(C_2L_2s^2+1\right)}{C_2L_2s^2+C_2R_2s+1}, \ \infty, \ \dfrac{R_4}{C_4R_4s+1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{R_4}{2C_4R_4s + 2}$$

10.60 INVALID-ORDER-60 $Z(s) = \left(\infty, \ \dfrac{R_2\left(C_2L_2s^2+1\right)}{C_2L_2s^2+C_2R_2s+1}, \ \infty, \ R_4 + \dfrac{1}{C_4s}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4R_4s + 1}{2C_4s}$$

10.61 INVALID-ORDER-61 $Z(s) = \left(\infty, \ \dfrac{R_2\left(C_2L_2s^2+1\right)}{C_2L_2s^2+C_2R_2s+1}, \ \infty, \ L_4s + \dfrac{1}{C_4s}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4L_4s^2 + 1}{2C_4s}$$

10.62 INVALID-ORDER-62 $Z(s) = \left(\infty, \ \dfrac{R_2\left(C_2L_2s^2+1\right)}{C_2L_2s^2+C_2R_2s+1}, \ \infty, \ \dfrac{L_4s}{C_4L_4s^2+1}, \ \infty, \ \infty \right)$

$$H(s) = \frac{L_4s}{2C_4L_4s^2 + 2}$$

10.63 INVALID-ORDER-63 $Z(s) = \left(\infty, \ \dfrac{R_2\left(C_2L_2s^2+1\right)}{C_2L_2s^2+C_2R_2s+1}, \ \infty, \ L_4s + R_4 + \dfrac{1}{C_4s}, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4L_4s^2 + C_4R_4s + 1}{2C_4s}$$

10.64 INVALID-ORDER-64 $Z(s) = \left(\infty, \ \dfrac{R_2\left(C_2L_2s^2+1\right)}{C_2L_2s^2+C_2R_2s+1}, \ \infty, \ \dfrac{L_4s}{C_4L_4s^2+1} + R_4, \ \infty, \ \infty \right)$

$$H(s) = \frac{C_4L_4R_4s^2 + L_4s + R_4}{2C_4L_4s^2 + 2}$$

11 PolynomialError