

Filter Summary Report: TIA,simple,Z2,Z5

Generated by MacAnalog-Symbolix

December 11, 2024

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10.40INVALID-ORDER-40	$Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$	11
10.41INVALID-ORDER-41	$Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$	11
10.42INVALID-ORDER-42	$Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 R_5 s^2 + L_5 s + R_5}, \infty \right)$	11
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10.45INVALID-ORDER-45	$Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{1}{C_5 s}, \infty \right)$	12
10.46INVALID-ORDER-46	$Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \infty \right)$	12
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10.48INVALID-ORDER-48	$Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, L_5 s + \frac{1}{C_5 s}, \infty \right)$	12
10.49INVALID-ORDER-49	$Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$	12
10.50INVALID-ORDER-50	$Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$	12
10.51INVALID-ORDER-51	$Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 R_5 s^2 + L_5 s + R_5}, \infty \right)$	12
10.52INVALID-ORDER-52	$Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1} + R_5, \infty \right)$	12

10.53INVALID-ORDER-53	$Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{R_5(C_5 L_5 s^2 + 1)}{C_5 L_5 s^2 + C_5 R_5 s + 1}, \infty \right)$	13
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10.55INVALID-ORDER-55	$Z(s) = \left(\infty, \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \infty \right)$	13
10.56INVALID-ORDER-56	$Z(s) = \left(\infty, \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \infty, \infty, R_5 + \frac{1}{C_5 s}, \infty \right)$	13
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10.58INVALID-ORDER-58	$Z(s) = \left(\infty, \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$	13
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10.62INVALID-ORDER-62	$Z(s) = \left(\infty, \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \infty, \infty, \frac{R_5(C_5 L_5 s^2 + 1)}{C_5 L_5 s^2 + C_5 R_5 s + 1}, \infty \right)$	14
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10.65INVALID-ORDER-65	$Z(s) = \left(\infty, \frac{R_2(C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, R_5 + \frac{1}{C_5 s}, \infty \right)$	14
10.66INVALID-ORDER-66	$Z(s) = \left(\infty, \frac{R_2(C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, L_5 s + \frac{1}{C_5 s}, \infty \right)$	14
10.67INVALID-ORDER-67	$Z(s) = \left(\infty, \frac{R_2(C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$	14
10.68INVALID-ORDER-68	$Z(s) = \left(\infty, \frac{R_2(C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$	14
10.69INVALID-ORDER-69	$Z(s) = \left(\infty, \frac{R_2(C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 R_5 s^2 + L_5 s + R_5}, \infty \right)$	14
10.70INVALID-ORDER-70	$Z(s) = \left(\infty, \frac{R_2(C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1} + R_5, \infty \right)$	14
10.71INVALID-ORDER-71	$Z(s) = \left(\infty, \frac{R_2(C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{R_5(C_5 L_5 s^2 + 1)}{C_5 L_5 s^2 + C_5 R_5 s + 1}, \infty \right)$	15

11 PolynomialError

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1 Examined $H(z)$ for TIA simple Z2 Z5: $\frac{Z_2 Z_5 g_m - Z_2 + Z_5}{2Z_2 g_m + 4}$

$$H(z) = \frac{Z_2 Z_5 g_m - Z_2 + Z_5}{2Z_2 g_m + 4}$$

2 HP

3 BP

4 LP

5 BS

6 GE

6.1 GE-1

$$Z(s) = \left(\infty, R_2, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 R_5 s^2 + L_5 s + R_5}, \infty \right)$$

$$H(s) = \frac{-C_5 L_5 R_2 R_5 s^2 - R_2 R_5 + s (L_5 R_2 R_5 g_m - L_5 R_2 + L_5 R_5)}{2R_2 R_5 g_m + 4R_5 + s^2 (2C_5 L_5 R_2 R_5 g_m + 4C_5 L_5 R_5) + s (2L_5 R_2 g_m + 4L_5)}$$

Parameters:

$$\begin{aligned} \text{Q: } & C_5 R_5 \sqrt{\frac{1}{C_5 L_5}} \\ \text{wo: } & \sqrt{\frac{1}{C_5 L_5}} \\ \text{bandwidth: } & \frac{1}{C_5 R_5} \\ \text{K-LP: } & -\frac{R_2}{2R_2 g_m + 4} \\ \text{K-HP: } & -\frac{R_2}{2R_2 g_m + 4} \\ \text{K-BP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2(R_2 g_m + 2)} \\ \text{QZ: } & -\frac{C_5 R_2 R_5 \sqrt{\frac{1}{C_5 L_5}}}{R_2 R_5 g_m - R_2 + R_5} \\ \text{WZ: } & \sqrt{\frac{1}{C_5 L_5}} \end{aligned}$$

6.2 GE-2

$$Z(s) = \left(\infty, R_2, \infty, \infty, \frac{R_5 (C_5 L_5 s^2 + 1)}{C_5 L_5 s^2 + C_5 R_5 s + 1}, \infty \right)$$

$$H(s) = \frac{-C_5 R_2 R_5 s + R_2 R_5 g_m - R_2 + R_5 + s^2 (C_5 L_5 R_2 R_5 g_m - C_5 L_5 R_2 + C_5 L_5 R_5)}{2R_2 g_m + s^2 (2C_5 L_5 R_2 g_m + 4C_5 L_5) + s (2C_5 R_2 R_5 g_m + 4C_5 R_5) + 4}$$

Parameters:

$$\begin{aligned} \text{Q: } & \frac{L_5 \sqrt{\frac{1}{C_5 L_5}}}{R_5} \\ \text{wo: } & \sqrt{\frac{1}{C_5 L_5}} \\ \text{bandwidth: } & \frac{R_5}{L_5} \\ \text{K-LP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2(R_2 g_m + 2)} \\ \text{K-HP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2(R_2 g_m + 2)} \\ \text{K-BP: } & -\frac{R_2}{2R_2 g_m + 4} \\ \text{QZ: } & \frac{L_5 \sqrt{\frac{1}{C_5 L_5}} (-R_2 R_5 g_m + R_2 - R_5)}{R_2 R_5} \\ \text{WZ: } & \sqrt{\frac{1}{C_5 L_5}} \end{aligned}$$

6.3 GE-3 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, R_5, \infty \right)$

$$H(s) = \frac{C_2 R_5 s + R_5 g_m + s^2 (C_2 L_2 R_5 g_m - C_2 L_2) - 1}{2 C_2 L_2 g_m s^2 + 4 C_2 s + 2 g_m}$$

Parameters:

$$\begin{aligned} \text{Q: } & \frac{L_2 g_m \sqrt{\frac{1}{C_2 L_2}}}{2} \\ \text{wo: } & \sqrt{\frac{1}{C_2 L_2}} \\ \text{bandwidth: } & \frac{2}{L_2 g_m} \\ \text{K-LP: } & \frac{R_5 g_m - 1}{2 g_m} \\ \text{K-HP: } & \frac{R_5 g_m - 1}{2 g_m} \\ \text{K-BP: } & \frac{R_5}{4} \\ \text{QZ: } & \frac{L_2 \sqrt{\frac{1}{C_2 L_2}} (R_5 g_m - 1)}{R_5} \\ \text{WZ: } & \sqrt{\frac{1}{C_2 L_2}} \end{aligned}$$

6.4 GE-4 $Z(s) = \left(\infty, L_2 s + R_2 + \frac{1}{C_2 s}, \infty, \infty, R_5, \infty \right)$

$$H(s) = \frac{R_5 g_m + s^2 (C_2 L_2 R_5 g_m - C_2 L_2) + s (C_2 R_2 R_5 g_m - C_2 R_2 + C_2 R_5) - 1}{2 C_2 L_2 g_m s^2 + 2 g_m + s (2 C_2 R_2 g_m + 4 C_2)}$$

Parameters:

$$\begin{aligned} \text{Q: } & \frac{L_2 g_m \sqrt{\frac{1}{C_2 L_2}}}{R_2 g_m + 2} \\ \text{wo: } & \sqrt{\frac{1}{C_2 L_2}} \\ \text{bandwidth: } & \frac{R_2 g_m + 2}{L_2 g_m} \\ \text{K-LP: } & \frac{R_5 g_m - 1}{2 g_m} \\ \text{K-HP: } & \frac{R_5 g_m - 1}{2 g_m} \\ \text{K-BP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2 (R_2 g_m + 2)} \\ \text{QZ: } & \frac{L_2 \sqrt{\frac{1}{C_2 L_2}} (R_5 g_m - 1)}{R_2 R_5 g_m - R_2 + R_5} \\ \text{WZ: } & \sqrt{\frac{1}{C_2 L_2}} \end{aligned}$$

6.5 GE-5 $Z(s) = \left(\infty, \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \infty, \infty, R_5, \infty \right)$

$$H(s) = \frac{R_2 R_5 g_m - R_2 + R_5 + s^2 (C_2 L_2 R_2 R_5 g_m - C_2 L_2 R_2 + C_2 L_2 R_5) + s (L_2 R_5 g_m - L_2)}{2 L_2 g_m s + 2 R_2 g_m + s^2 (2 C_2 L_2 R_2 g_m + 4 C_2 L_2) + 4}$$

Parameters:

$$\begin{aligned} \text{Q: } & \frac{C_2 \sqrt{\frac{1}{C_2 L_2}} (R_2 g_m + 2)}{g_m} \\ \text{wo: } & \sqrt{\frac{1}{C_2 L_2}} \\ \text{bandwidth: } & \frac{g_m}{C_2 (R_2 g_m + 2)} \\ \text{K-LP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2 (R_2 g_m + 2)} \\ \text{K-HP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2 (R_2 g_m + 2)} \\ \text{K-BP: } & \frac{R_5 g_m - 1}{2 g_m} \\ \text{QZ: } & \frac{C_2 \sqrt{\frac{1}{C_2 L_2}} (R_2 R_5 g_m - R_2 + R_5)}{R_5 g_m - 1} \\ \text{WZ: } & \sqrt{\frac{1}{C_2 L_2}} \end{aligned}$$

6.6 GE-6 $Z(s) = \left(\infty, \frac{R_2(C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, R_5, \infty \right)$

$$H(s) = \frac{C_2 R_2 R_5 s + R_2 R_5 g_m - R_2 + R_5 + s^2 (C_2 L_2 R_2 R_5 g_m - C_2 L_2 R_2 + C_2 L_2 R_5)}{4 C_2 R_2 s + 2 R_2 g_m + s^2 (2 C_2 L_2 R_2 g_m + 4 C_2 L_2) + 4}$$

Parameters:

$$\begin{aligned} \text{Q: } & \frac{L_2 \sqrt{\frac{1}{C_2 L_2}} (R_2 g_m + 2)}{2 R_2} \\ \text{wo: } & \sqrt{\frac{1}{C_2 L_2}} \\ \text{bandwidth: } & \frac{2 R_2}{L_2 (R_2 g_m + 2)} \\ \text{K-LP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2 (R_2 g_m + 2)} \\ \text{K-HP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2 (R_2 g_m + 2)} \\ \text{K-BP: } & \frac{R_5}{4} \\ \text{QZ: } & \frac{L_2 \sqrt{\frac{1}{C_2 L_2}} (R_2 R_5 g_m - R_2 + R_5)}{R_2 R_5} \\ \text{Wz: } & \sqrt{\frac{1}{C_2 L_2}} \end{aligned}$$

7 AP

8 INVALID-NUMER

8.1 INVALID-NUMER-1 $Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{R_5 g_m + s (C_2 R_5 - C_5 R_5) - 1}{4 C_2 C_5 R_5 s^2 + 2 g_m + s (4 C_2 + 2 C_5 R_5 g_m)}$$

Parameters:

$$\begin{aligned} \text{Q: } & \frac{\sqrt{2} C_2 C_5 R_5 \sqrt{\frac{g_m}{C_2 C_5 R_5}}}{2 C_2 + C_5 R_5 g_m} \\ \text{wo: } & \frac{\sqrt{2} \sqrt{\frac{g_m}{C_2 C_5 R_5}}}{2} \\ \text{bandwidth: } & \frac{2 C_2 + C_5 R_5 g_m}{2 C_2 C_5 R_5} \\ \text{K-LP: } & \frac{R_5 g_m - 1}{2 g_m} \\ \text{K-HP: } & 0 \\ \text{K-BP: } & \frac{R_5 (C_2 - C_5)}{2 (2 C_2 + C_5 R_5 g_m)} \\ \text{QZ: } & 0 \\ \text{Wz: } & \text{None} \end{aligned}$$

8.2 INVALID-NUMER-2 $Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{R_2 R_5 g_m - R_2 + R_5 + s (C_2 R_2 R_5 - C_5 R_2 R_5)}{4 C_2 C_5 R_2 R_5 s^2 + 2 R_2 g_m + s (4 C_2 R_2 + 2 C_5 R_2 R_5 g_m + 4 C_5 R_5) + 4}$$

Parameters:

$$\begin{aligned} \text{Q: } & \frac{\sqrt{2} C_2 C_5 R_2 R_5 \sqrt{\frac{R_2 g_m + 2}{C_2 C_5 R_2 R_5}}}{2 C_2 R_2 + C_5 R_2 R_5 g_m + 2 C_5 R_5} \\ \text{wo: } & \frac{\sqrt{2} \sqrt{\frac{R_2 g_m + 2}{C_2 C_5 R_2 R_5}}}{2} \\ \text{bandwidth: } & \frac{2 C_2 R_2 + C_5 R_2 R_5 g_m + 2 C_5 R_5}{2 C_2 C_5 R_2 R_5} \\ \text{K-LP: } & \frac{R_2 R_5 g_m - R_2 + R_5}{2 (R_2 g_m + 2)} \\ \text{K-HP: } & 0 \\ \text{K-BP: } & \frac{R_2 R_5 (C_2 - C_5)}{2 (2 C_2 R_2 + C_5 R_2 R_5 g_m + 2 C_5 R_5)} \\ \text{QZ: } & 0 \\ \text{Wz: } & \text{None} \end{aligned}$$

9 INVALID-WZ

9.1 INVALID-WZ-1 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 R_2 R_5 s^2 + R_5 g_m + s (C_2 R_2 R_5 g_m - C_2 R_2 + C_2 R_5 - C_5 R_5) - 1}{2g_m + s^2 (2C_2 C_5 R_2 R_5 g_m + 4C_2 C_5 R_5) + s (2C_2 R_2 g_m + 4C_2 + 2C_5 R_5 g_m)}$$

Parameters:

Q: $\frac{C_2 C_5 R_5 \sqrt{\frac{g_m}{C_2 C_5 R_5 (R_2 g_m + 2)}} (R_2 g_m + 2)}{C_2 R_2 g_m + 2C_2 + C_5 R_5 g_m}$

wo: $\sqrt{\frac{g_m}{C_2 C_5 R_5 (R_2 g_m + 2)}}$

bandwidth: $\frac{C_2 R_2 g_m + 2C_2 + C_5 R_5 g_m}{C_2 C_5 R_5 (R_2 g_m + 2)}$

K-LP: $\frac{R_5 g_m - 1}{2g_m}$

K-HP: $-\frac{R_2}{2R_2 g_m + 4}$

K-BP: $\frac{C_2 R_2 R_5 g_m - C_2 R_2 + C_2 R_5 - C_5 R_5}{2(C_2 R_2 g_m + 2C_2 + C_5 R_5 g_m)}$

QZ: $-\frac{C_2 C_5 R_2 R_5 \sqrt{\frac{g_m}{C_2 C_5 R_5 (R_2 g_m + 2)}}}{C_2 R_2 R_5 g_m - C_2 R_2 + C_2 R_5 - C_5 R_5}$

WZ: $\sqrt{\frac{-R_5 g_m + 1}{C_2 C_5 R_2 R_5}}$

10 INVALID-ORDER

10.1 INVALID-ORDER-1 $Z(s) = (\infty, R_2, \infty, \infty, R_5, \infty)$

$$H(s) = \frac{R_2 R_5 g_m - R_2 + R_5}{2R_2 g_m + 4}$$

10.2 INVALID-ORDER-2 $Z(s) = \left(\infty, R_2, \infty, \infty, \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{-C_5 R_2 s + R_2 g_m + 1}{s (2C_5 R_2 g_m + 4C_5)}$$

10.3 INVALID-ORDER-3 $Z(s) = \left(\infty, R_2, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{-C_5 R_2 R_5 s + R_2 R_5 g_m - R_2 + R_5}{2R_2 g_m + s (2C_5 R_2 R_5 g_m + 4C_5 R_5) + 4}$$

10.4 INVALID-ORDER-4 $Z(s) = \left(\infty, R_2, \infty, \infty, R_5 + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{R_2 g_m + s (C_5 R_2 R_5 g_m - C_5 R_2 + C_5 R_5) + 1}{s (2C_5 R_2 g_m + 4C_5)}$$

10.5 INVALID-ORDER-5 $Z(s) = \left(\infty, R_2, \infty, \infty, L_5 s + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{-C_5 R_2 s + R_2 g_m + s^2 (C_5 L_5 R_2 g_m + C_5 L_5) + 1}{s (2C_5 R_2 g_m + 4C_5)}$$

10.6 INVALID-ORDER-6 $Z(s) = \left(\infty, R_2, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$

$$H(s) = \frac{-C_5 L_5 R_2 s^2 - R_2 + s (L_5 R_2 g_m + L_5)}{2R_2 g_m + s^2 (2C_5 L_5 R_2 g_m + 4C_5 L_5) + 4}$$

$$10.7 \quad \text{INVALID-ORDER-7} \quad Z(s) = \left(\infty, R_2, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{R_2 g_m + s^2 (C_5 L_5 R_2 g_m + C_5 L_5) + s (C_5 R_2 R_5 g_m - C_5 R_2 + C_5 R_5) + 1}{s (2C_5 R_2 g_m + 4C_5)}$$

$$10.8 \quad \text{INVALID-ORDER-8} \quad Z(s) = \left(\infty, R_2, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1} + R_5, \infty \right)$$

$$H(s) = \frac{R_2 R_5 g_m - R_2 + R_5 + s^2 (C_5 L_5 R_2 R_5 g_m - C_5 L_5 R_2 + C_5 L_5 R_5) + s (L_5 R_2 g_m + L_5)}{2R_2 g_m + s^2 (2C_5 L_5 R_2 g_m + 4C_5 L_5) + 4}$$

$$10.9 \quad \text{INVALID-ORDER-9} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, R_5, \infty \right)$$

$$H(s) = \frac{C_2 R_5 s + R_5 g_m - 1}{4C_2 s + 2g_m}$$

$$10.10 \quad \text{INVALID-ORDER-10} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{g_m + s (C_2 - C_5)}{4C_2 C_5 s^2 + 2C_5 g_m s}$$

$$10.11 \quad \text{INVALID-ORDER-11} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, R_5 + \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{C_2 C_5 R_5 s^2 + g_m + s (C_2 + C_5 R_5 g_m - C_5)}{4C_2 C_5 s^2 + 2C_5 g_m s}$$

$$10.12 \quad \text{INVALID-ORDER-12} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, L_5 s + \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{C_2 C_5 L_5 s^3 + C_5 L_5 g_m s^2 + g_m + s (C_2 - C_5)}{4C_2 C_5 s^2 + 2C_5 g_m s}$$

$$10.13 \quad \text{INVALID-ORDER-13} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$$

$$H(s) = \frac{L_5 g_m s + s^2 (C_2 L_5 - C_5 L_5) - 1}{4C_2 C_5 L_5 s^3 + 4C_2 s + 2C_5 L_5 g_m s^2 + 2g_m}$$

$$10.14 \quad \text{INVALID-ORDER-14} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{C_2 C_5 L_5 s^3 + g_m + s^2 (C_2 C_5 R_5 + C_5 L_5 g_m) + s (C_2 + C_5 R_5 g_m - C_5)}{4C_2 C_5 s^2 + 2C_5 g_m s}$$

$$10.15 \quad \text{INVALID-ORDER-15} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 R_5 s^2 + L_5 s + R_5}, \infty \right)$$

$$H(s) = \frac{-R_5 + s^2 (C_2 L_5 R_5 - C_5 L_5 R_5) + s (L_5 R_5 g_m - L_5)}{4C_2 C_5 L_5 R_5 s^3 + 2R_5 g_m + s^2 (4C_2 L_5 + 2C_5 L_5 R_5 g_m) + s (4C_2 R_5 + 2L_5 g_m)}$$

$$10.16 \quad \text{INVALID-ORDER-16} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1} + R_5, \infty \right)$$

$$H(s) = \frac{C_2 C_5 L_5 R_5 s^3 + R_5 g_m + s^2 (C_2 L_5 + C_5 L_5 R_5 g_m - C_5 L_5) + s (C_2 R_5 + L_5 g_m) - 1}{4C_2 C_5 L_5 s^3 + 4C_2 s + 2C_5 L_5 g_m s^2 + 2g_m}$$

$$10.17 \quad \text{INVALID-ORDER-17} \quad Z(s) = \left(\infty, \frac{1}{C_2 s}, \infty, \infty, \frac{R_5(C_5 L_5 s^2 + 1)}{C_5 L_5 s^2 + C_5 R_5 s + 1}, \infty \right)$$

$$H(s) = \frac{C_2 C_5 L_5 R_5 s^3 + R_5 g_m + s^2 (C_5 L_5 R_5 g_m - C_5 L_5) + s (C_2 R_5 - C_5 R_5) - 1}{4 C_2 C_5 L_5 s^3 + 2 g_m + s^2 (4 C_2 C_5 R_5 + 2 C_5 L_5 g_m) + s (4 C_2 + 2 C_5 R_5 g_m)}$$

$$10.18 \quad \text{INVALID-ORDER-18} \quad Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, R_5, \infty \right)$$

$$H(s) = \frac{C_2 R_2 R_5 s + R_2 R_5 g_m - R_2 + R_5}{4 C_2 R_2 s + 2 R_2 g_m + 4}$$

$$10.19 \quad \text{INVALID-ORDER-19} \quad Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{R_2 g_m + s (C_2 R_2 - C_5 R_2) + 1}{4 C_2 C_5 R_2 s^2 + s (2 C_5 R_2 g_m + 4 C_5)}$$

$$10.20 \quad \text{INVALID-ORDER-20} \quad Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, R_5 + \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{C_2 C_5 R_2 R_5 s^2 + R_2 g_m + s (C_2 R_2 + C_5 R_2 R_5 g_m - C_5 R_2 + C_5 R_5) + 1}{4 C_2 C_5 R_2 s^2 + s (2 C_5 R_2 g_m + 4 C_5)}$$

$$10.21 \quad \text{INVALID-ORDER-21} \quad Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, L_5 s + \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{C_2 C_5 L_5 R_2 s^3 + R_2 g_m + s^2 (C_5 L_5 R_2 g_m + C_5 L_5) + s (C_2 R_2 - C_5 R_2) + 1}{4 C_2 C_5 R_2 s^2 + s (2 C_5 R_2 g_m + 4 C_5)}$$

$$10.22 \quad \text{INVALID-ORDER-22} \quad Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$$

$$H(s) = \frac{-R_2 + s^2 (C_2 L_5 R_2 - C_5 L_5 R_2) + s (L_5 R_2 g_m + L_5)}{4 C_2 C_5 L_5 R_2 s^3 + 4 C_2 R_2 s + 2 R_2 g_m + s^2 (2 C_5 L_5 R_2 g_m + 4 C_5 L_5) + 4}$$

$$10.23 \quad \text{INVALID-ORDER-23} \quad Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$$

$$H(s) = \frac{C_2 C_5 L_5 R_2 s^3 + R_2 g_m + s^2 (C_2 C_5 R_2 R_5 + C_5 L_5 R_2 g_m + C_5 L_5) + s (C_2 R_2 + C_5 R_2 R_5 g_m - C_5 R_2 + C_5 R_5) + 1}{4 C_2 C_5 R_2 s^2 + s (2 C_5 R_2 g_m + 4 C_5)}$$

$$10.24 \quad \text{INVALID-ORDER-24} \quad Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 R_5 s^2 + L_5 s + R_5}, \infty \right)$$

$$H(s) = \frac{-R_2 R_5 + s^2 (C_2 L_5 R_2 R_5 - C_5 L_5 R_2 R_5) + s (L_5 R_2 R_5 g_m - L_5 R_2 + L_5 R_5)}{4 C_2 C_5 L_5 R_2 R_5 s^3 + 2 R_2 R_5 g_m + 4 R_5 + s^2 (4 C_2 L_5 R_2 + 2 C_5 L_5 R_2 R_5 g_m + 4 C_5 L_5 R_5) + s (4 C_2 R_2 R_5 + 2 L_5 R_2 g_m + 4 L_5)}$$

$$10.25 \quad \text{INVALID-ORDER-25} \quad Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1} + R_5, \infty \right)$$

$$H(s) = \frac{C_2 C_5 L_5 R_2 R_5 s^3 + R_2 R_5 g_m - R_2 + R_5 + s^2 (C_2 L_5 R_2 + C_5 L_5 R_2 R_5 g_m - C_5 L_5 R_2 + C_5 L_5 R_5) + s (C_2 R_2 R_5 + L_5 R_2 g_m + L_5)}{4 C_2 C_5 L_5 R_2 s^3 + 4 C_2 R_2 s + 2 R_2 g_m + s^2 (2 C_5 L_5 R_2 g_m + 4 C_5 L_5) + 4}$$

10.26 INVALID-ORDER-26 $Z(s) = \left(\infty, \frac{R_2}{C_2 R_2 s + 1}, \infty, \infty, \frac{R_5(C_5 L_5 s^2 + 1)}{C_5 L_5 s^2 + C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{C_2 C_5 L_5 R_2 R_5 s^3 + R_2 R_5 g_m - R_2 + R_5 + s^2 (C_5 L_5 R_2 R_5 g_m - C_5 L_5 R_2 + C_5 L_5 R_5) + s (C_2 R_2 R_5 - C_5 R_2 R_5)}{4 C_2 C_5 L_5 R_2 s^3 + 2 R_2 g_m + s^2 (4 C_2 C_5 R_2 R_5 + 2 C_5 L_5 R_2 g_m + 4 C_5 L_5) + s (4 C_2 R_2 + 2 C_5 R_2 R_5 g_m + 4 C_5 R_5) + 4}$$

10.27 INVALID-ORDER-27 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, R_5, \infty \right)$

$$H(s) = \frac{R_5 g_m + s (C_2 R_2 R_5 g_m - C_2 R_2 + C_2 R_5) - 1}{2 g_m + s (2 C_2 R_2 g_m + 4 C_2)}$$

10.28 INVALID-ORDER-28 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 R_2 s^2 + g_m + s (C_2 R_2 g_m + C_2 - C_5)}{2 C_5 g_m s + s^2 (2 C_2 C_5 R_2 g_m + 4 C_2 C_5)}$$

10.29 INVALID-ORDER-29 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, R_5 + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{g_m + s^2 (C_2 C_5 R_2 R_5 g_m - C_2 C_5 R_2 + C_2 C_5 R_5) + s (C_2 R_2 g_m + C_2 + C_5 R_5 g_m - C_5)}{2 C_5 g_m s + s^2 (2 C_2 C_5 R_2 g_m + 4 C_2 C_5)}$$

10.30 INVALID-ORDER-30 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, L_5 s + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{g_m + s^3 (C_2 C_5 L_5 R_2 g_m + C_2 C_5 L_5) + s^2 (-C_2 C_5 R_2 + C_5 L_5 g_m) + s (C_2 R_2 g_m + C_2 - C_5)}{2 C_5 g_m s + s^2 (2 C_2 C_5 R_2 g_m + 4 C_2 C_5)}$$

10.31 INVALID-ORDER-31 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_5 R_2 s^3 + s^2 (C_2 L_5 R_2 g_m + C_2 L_5 - C_5 L_5) + s (-C_2 R_2 + L_5 g_m) - 1}{2 C_5 L_5 g_m s^2 + 2 g_m + s^3 (2 C_2 C_5 L_5 R_2 g_m + 4 C_2 C_5 L_5) + s (2 C_2 R_2 g_m + 4 C_2)}$$

10.32 INVALID-ORDER-32 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{g_m + s^3 (C_2 C_5 L_5 R_2 g_m + C_2 C_5 L_5) + s^2 (C_2 C_5 R_2 R_5 g_m - C_2 C_5 R_2 + C_2 C_5 R_5 + C_5 L_5 g_m) + s (C_2 R_2 g_m + C_2 + C_5 R_5 g_m - C_5)}{2 C_5 g_m s + s^2 (2 C_2 C_5 R_2 g_m + 4 C_2 C_5)}$$

10.33 INVALID-ORDER-33 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 R_5 s^2 + L_5 s + R_5}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_5 R_2 R_5 s^3 - R_5 + s^2 (C_2 L_5 R_2 R_5 g_m - C_2 L_5 R_2 + C_2 L_5 R_5 - C_5 L_5 R_5) + s (-C_2 R_2 R_5 + L_5 R_5 g_m - L_5)}{2 R_5 g_m + s^3 (2 C_2 C_5 L_5 R_2 R_5 g_m + 4 C_2 C_5 L_5 R_5) + s^2 (2 C_2 L_5 R_2 g_m + 4 C_2 L_5 + 2 C_5 L_5 R_5 g_m) + s (2 C_2 R_2 R_5 g_m + 4 C_2 R_5 + 2 L_5 g_m)}$$

10.34 INVALID-ORDER-34 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1} + R_5, \infty \right)$

$$H(s) = \frac{R_5 g_m + s^3 (C_2 C_5 L_5 R_2 R_5 g_m - C_2 C_5 L_5 R_2 + C_2 C_5 L_5 R_5) + s^2 (C_2 L_5 R_2 g_m + C_2 L_5 + C_5 L_5 R_5 g_m - C_5 L_5) + s (C_2 R_2 R_5 g_m - C_2 R_2 + C_2 R_5 + L_5 g_m) - 1}{2 C_5 L_5 g_m s^2 + 2 g_m + s^3 (2 C_2 C_5 L_5 R_2 g_m + 4 C_2 C_5 L_5) + s (2 C_2 R_2 g_m + 4 C_2)}$$

10.35 INVALID-ORDER-35 $Z(s) = \left(\infty, R_2 + \frac{1}{C_2 s}, \infty, \infty, \frac{R_5(C_5 L_5 s^2 + 1)}{C_5 L_5 s^2 + C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{R_5 g_m + s^3 (C_2 C_5 L_5 R_2 R_5 g_m - C_2 C_5 L_5 R_2 + C_2 C_5 L_5 R_5) + s^2 (-C_2 C_5 R_2 R_5 + C_5 L_5 R_5 g_m - C_5 L_5) + s (C_2 R_2 R_5 g_m - C_2 R_2 + C_2 R_5 - C_5 R_5) - 1}{2g_m + s^3 (2C_2 C_5 L_5 R_2 g_m + 4C_2 C_5 L_5) + s^2 (2C_2 C_5 R_2 R_5 g_m + 4C_2 C_5 R_5 + 2C_5 L_5 g_m) + s (2C_2 R_2 g_m + 4C_2 + 2C_5 R_5 g_m)}$$

10.36 INVALID-ORDER-36 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_2 s^3 + C_2 L_2 g_m s^2 + g_m + s (C_2 - C_5)}{2C_2 C_5 L_2 g_m s^3 + 4C_2 C_5 s^2 + 2C_5 g_m s}$$

10.37 INVALID-ORDER-37 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_2 R_5 s^3 + R_5 g_m + s^2 (C_2 L_2 R_5 g_m - C_2 L_2) + s (C_2 R_5 - C_5 R_5) - 1}{2C_2 C_5 L_2 R_5 g_m s^3 + 2g_m + s^2 (4C_2 C_5 R_5 + 2C_2 L_2 g_m) + s (4C_2 + 2C_5 R_5 g_m)}$$

10.38 INVALID-ORDER-38 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, R_5 + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{g_m + s^3 (C_2 C_5 L_2 R_5 g_m - C_2 C_5 L_2) + s^2 (C_2 C_5 R_5 + C_2 L_2 g_m) + s (C_2 + C_5 R_5 g_m - C_5)}{2C_2 C_5 L_2 g_m s^3 + 4C_2 C_5 s^2 + 2C_5 g_m s}$$

10.39 INVALID-ORDER-39 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, L_5 s + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{C_2 C_5 L_2 L_5 g_m s^4 + g_m + s^3 (-C_2 C_5 L_2 + C_2 C_5 L_5) + s^2 (C_2 L_2 g_m + C_5 L_5 g_m) + s (C_2 - C_5)}{2C_2 C_5 L_2 g_m s^3 + 4C_2 C_5 s^2 + 2C_5 g_m s}$$

10.40 INVALID-ORDER-40 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_2 L_5 s^4 + C_2 L_2 L_5 g_m s^3 + L_5 g_m s + s^2 (-C_2 L_2 + C_2 L_5 - C_5 L_5) - 1}{2C_2 C_5 L_2 L_5 g_m s^4 + 4C_2 C_5 L_5 s^3 + 4C_2 s + 2g_m + s^2 (2C_2 L_2 g_m + 2C_5 L_5 g_m)}$$

10.41 INVALID-ORDER-41 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{C_2 C_5 L_2 L_5 g_m s^4 + g_m + s^3 (C_2 C_5 L_2 R_5 g_m - C_2 C_5 L_2 + C_2 C_5 L_5) + s^2 (C_2 C_5 R_5 + C_2 L_2 g_m + C_5 L_5 g_m) + s (C_2 + C_5 R_5 g_m - C_5)}{2C_2 C_5 L_2 g_m s^3 + 4C_2 C_5 s^2 + 2C_5 g_m s}$$

10.42 INVALID-ORDER-42 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 R_5 s^2 + L_5 s + R_5}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_2 L_5 R_5 s^4 - R_5 + s^3 (C_2 L_2 L_5 R_5 g_m - C_2 L_2 L_5) + s^2 (-C_2 L_2 R_5 + C_2 L_5 R_5 - C_5 L_5 R_5) + s (L_5 R_5 g_m - L_5)}{2C_2 C_5 L_2 L_5 R_5 g_m s^4 + 2R_5 g_m + s^3 (4C_2 C_5 L_5 R_5 + 2C_2 L_2 L_5 g_m) + s^2 (2C_2 L_2 R_5 g_m + 4C_2 L_5 + 2C_5 L_5 R_5 g_m) + s (4C_2 R_5 + 2L_5 g_m)}$$

10.43 INVALID-ORDER-43 $Z(s) = \left(\infty, L_2 s + \frac{1}{C_2 s}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1} + R_5, \infty \right)$

$$H(s) = \frac{R_5 g_m + s^4 (C_2 C_5 L_2 L_5 R_5 g_m - C_2 C_5 L_2 L_5) + s^3 (C_2 C_5 L_5 R_5 + C_2 L_2 L_5 g_m) + s^2 (C_2 L_2 R_5 g_m - C_2 L_2 + C_2 L_5 + C_5 L_5 R_5 g_m - C_5 L_5) + s (C_2 R_5 + L_5 g_m) - 1}{2C_2 C_5 L_2 L_5 g_m s^4 + 4C_2 C_5 L_5 s^3 + 4C_2 s + 2g_m + s^2 (2C_2 L_2 g_m + 2C_5 L_5 g_m)}$$

10.44 INVALID-ORDER-44 $Z(s) = \left(\infty, L_2s + \frac{1}{C_2s}, \infty, \infty, \frac{R_5(C_5L_5s^2+1)}{C_5L_5s^2+C_5R_5s+1}, \infty \right)$

$$H(s) = \frac{R_5g_m + s^4(C_2C_5L_2L_5R_5g_m - C_2C_5L_2L_5) + s^3(-C_2C_5L_2R_5 + C_2C_5L_5R_5) + s^2(C_2L_2R_5g_m - C_2L_2 + C_5L_5R_5g_m - C_5L_5) + s(C_2R_5 - C_5R_5) - 1}{2C_2C_5L_2L_5g_ms^4 + 2g_m + s^3(2C_2C_5L_2R_5g_m + 4C_2C_5L_5) + s^2(4C_2C_5R_5 + 2C_2L_2g_m + 2C_5L_5g_m) + s(4C_2 + 2C_5R_5g_m)}$$

10.45 INVALID-ORDER-45 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, \frac{1}{C_5s}, \infty \right)$

$$H(s) = \frac{-C_2C_5L_2s^3 + g_m + s^2(-C_2C_5R_2 + C_2L_2g_m) + s(C_2R_2g_m + C_2 - C_5)}{2C_2C_5L_2g_ms^3 + 2C_5g_ms + s^2(2C_2C_5R_2g_m + 4C_2C_5)}$$

10.46 INVALID-ORDER-46 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, \frac{R_5}{C_5R_5s+1}, \infty \right)$

$$H(s) = \frac{-C_2C_5L_2R_5s^3 + R_5g_m + s^2(-C_2C_5R_2R_5 + C_2L_2R_5g_m - C_2L_2) + s(C_2R_2R_5g_m - C_2R_2 + C_2R_5 - C_5R_5) - 1}{2C_2C_5L_2R_5g_ms^3 + 2g_m + s^2(2C_2C_5R_2R_5g_m + 4C_2C_5R_5 + 2C_2L_2g_m) + s(2C_2R_2g_m + 4C_2 + 2C_5R_5g_m)}$$

10.47 INVALID-ORDER-47 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, R_5 + \frac{1}{C_5s}, \infty \right)$

$$H(s) = \frac{g_m + s^3(C_2C_5L_2R_5g_m - C_2C_5L_2) + s^2(C_2C_5R_2R_5g_m - C_2C_5R_2 + C_2C_5R_5 + C_2L_2g_m) + s(C_2R_2g_m + C_2 + C_5R_5g_m - C_5)}{2C_2C_5L_2g_ms^3 + 2C_5g_ms + s^2(2C_2C_5R_2g_m + 4C_2C_5)}$$

10.48 INVALID-ORDER-48 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, L_5s + \frac{1}{C_5s}, \infty \right)$

$$H(s) = \frac{C_2C_5L_2L_5g_ms^4 + g_m + s^3(-C_2C_5L_2 + C_2C_5L_5R_2g_m + C_2C_5L_5) + s^2(-C_2C_5R_2 + C_2L_2g_m + C_5L_5g_m) + s(C_2R_2g_m + C_2 - C_5)}{2C_2C_5L_2g_ms^3 + 2C_5g_ms + s^2(2C_2C_5R_2g_m + 4C_2C_5)}$$

10.49 INVALID-ORDER-49 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, \frac{L_5s}{C_5L_5s^2+1}, \infty \right)$

$$H(s) = \frac{-C_2C_5L_2L_5s^4 + s^3(-C_2C_5L_5R_2 + C_2L_2L_5g_m) + s^2(-C_2L_2 + C_2L_5R_2g_m + C_2L_5 - C_5L_5) + s(-C_2R_2 + L_5g_m) - 1}{2C_2C_5L_2L_5g_ms^4 + 2g_m + s^3(2C_2C_5L_5R_2g_m + 4C_2C_5L_5) + s^2(2C_2L_2g_m + 2C_5L_5g_m) + s(2C_2R_2g_m + 4C_2)}$$

10.50 INVALID-ORDER-50 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, L_5s + R_5 + \frac{1}{C_5s}, \infty \right)$

$$H(s) = \frac{C_2C_5L_2L_5g_ms^4 + g_m + s^3(C_2C_5L_2R_5g_m - C_2C_5L_2 + C_2C_5L_5R_2g_m + C_2C_5L_5) + s^2(C_2C_5R_2R_5g_m - C_2C_5R_2 + C_2C_5R_5 + C_2L_2g_m + C_5L_5g_m) + s(C_2R_2g_m + C_2 + C_5R_5g_m - C_5)}{2C_2C_5L_2g_ms^3 + 2C_5g_ms + s^2(2C_2C_5R_2g_m + 4C_2C_5)}$$

10.51 INVALID-ORDER-51 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, \frac{L_5R_5s}{C_5L_5R_5s^2+L_5s+R_5}, \infty \right)$

$$H(s) = \frac{-C_2C_5L_2L_5R_5s^4 - R_5 + s^3(-C_2C_5L_5R_2R_5 + C_2L_2L_5R_5g_m - C_2L_2L_5) + s^2(-C_2L_2R_5 + C_2L_5R_2R_5g_m - C_2L_5R_2 + C_2L_5R_5 - C_5L_5R_5) + s(-C_2R_2R_5 + L_5R_5g_m - L_5)}{2C_2C_5L_2L_5R_5g_ms^4 + 2R_5g_m + s^3(2C_2C_5L_5R_2R_5g_m + 4C_2C_5L_5R_5 + 2C_2L_2L_5g_m) + s^2(2C_2L_2R_5g_m + 2C_2L_5R_2g_m + 4C_2L_5 + 2C_5L_5R_5g_m) + s(2C_2R_2R_5g_m + 4C_2R_5 + 2L_5g_m)}$$

10.52 INVALID-ORDER-52 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, \frac{L_5s}{C_5L_5s^2+1} + R_5, \infty \right)$

$$H(s) = \frac{R_5g_m + s^4(C_2C_5L_2L_5R_5g_m - C_2C_5L_2L_5) + s^3(C_2C_5L_5R_2R_5g_m - C_2C_5L_5R_2 + C_2C_5L_5R_5 + C_2L_2L_5g_m) + s^2(C_2L_2R_5g_m - C_2L_2 + C_2L_5R_2g_m + C_2L_5 + C_5L_5R_5g_m - C_5L_5) + s(C_2R_2R_5g_m - C_2R_2 + C_2R_5 + L_5g_m) - 1}{2C_2C_5L_2L_5g_ms^4 + 2g_m + s^3(2C_2C_5L_5R_2g_m + 4C_2C_5L_5) + s^2(2C_2L_2g_m + 2C_5L_5g_m) + s(2C_2R_2g_m + 4C_2)}$$

10.53 INVALID-ORDER-53 $Z(s) = \left(\infty, L_2s + R_2 + \frac{1}{C_2s}, \infty, \infty, \frac{R_5(C_5L_5s^2+1)}{C_5L_5s^2+C_5R_5s+1}, \infty \right)$

$$H(s) = \frac{R_5g_m + s^4(C_2C_5L_2L_5R_5g_m - C_2C_5L_2L_5) + s^3(-C_2C_5L_2R_5 + C_2C_5L_5R_2R_5g_m - C_2C_5L_5R_2 + C_2C_5L_5R_5) + s^2(-C_2C_5R_2R_5 + C_2L_2R_5g_m - C_2L_2 + C_5L_5R_5g_m - C_5L_5) + s(C_2R_2R_5g_m - C_2R_2 + C_2R_5 - C_5R_5) - 1}{2C_2C_5L_2L_5g_ms^4 + 2g_m + s^3(2C_2C_5L_2R_5g_m + 2C_2C_5L_5R_2g_m + 4C_2C_5L_5) + s^2(2C_2C_5R_2R_5g_m + 4C_2C_5R_5 + 2C_2L_2g_m + 2C_5L_5g_m) + s(2C_2R_2g_m + 4C_2 + 2C_5R_5g_m)}$$

10.54 INVALID-ORDER-54 $Z(s) = \left(\infty, \frac{L_2s}{C_2L_2s^2+1} + R_2, \infty, \infty, \frac{1}{C_5s}, \infty \right)$

$$H(s) = \frac{-C_2C_5L_2R_2s^3 + R_2g_m + s^2(C_2L_2R_2g_m + C_2L_2 - C_5L_2) + s(-C_5R_2 + L_2g_m) + 1}{2C_5L_2g_ms^2 + s^3(2C_2C_5L_2R_2g_m + 4C_2C_5L_2) + s(2C_5R_2g_m + 4C_5)}$$

10.55 INVALID-ORDER-55 $Z(s) = \left(\infty, \frac{L_2s}{C_2L_2s^2+1} + R_2, \infty, \infty, \frac{R_5}{C_5R_5s+1}, \infty \right)$

$$H(s) = \frac{-C_2C_5L_2R_2R_5s^3 + R_2R_5g_m - R_2 + R_5 + s^2(C_2L_2R_2R_5g_m - C_2L_2R_2 + C_2L_2R_5 - C_5L_2R_5) + s(-C_5R_2R_5 + L_2R_5g_m - L_2)}{2R_2g_m + s^3(2C_2C_5L_2R_2R_5g_m + 4C_2C_5L_2R_5) + s^2(2C_2L_2R_2g_m + 4C_2L_2 + 2C_5L_2R_5g_m) + s(2C_5R_2R_5g_m + 4C_5R_5 + 2L_2g_m) + 4}$$

10.56 INVALID-ORDER-56 $Z(s) = \left(\infty, \frac{L_2s}{C_2L_2s^2+1} + R_2, \infty, \infty, R_5 + \frac{1}{C_5s}, \infty \right)$

$$H(s) = \frac{R_2g_m + s^3(C_2C_5L_2R_2R_5g_m - C_2C_5L_2R_2 + C_2C_5L_2R_5) + s^2(C_2L_2R_2g_m + C_2L_2 + C_5L_2R_5g_m - C_5L_2) + s(C_5R_2R_5g_m - C_5R_2 + C_5R_5 + L_2g_m) + 1}{2C_5L_2g_ms^2 + s^3(2C_2C_5L_2R_2g_m + 4C_2C_5L_2) + s(2C_5R_2g_m + 4C_5)}$$

10.57 INVALID-ORDER-57 $Z(s) = \left(\infty, \frac{L_2s}{C_2L_2s^2+1} + R_2, \infty, \infty, L_5s + \frac{1}{C_5s}, \infty \right)$

$$H(s) = \frac{R_2g_m + s^4(C_2C_5L_2L_5R_2g_m + C_2C_5L_2L_5) + s^3(-C_2C_5L_2R_2 + C_5L_2L_5g_m) + s^2(C_2L_2R_2g_m + C_2L_2 - C_5L_2 + C_5L_5R_2g_m + C_5L_5) + s(-C_5R_2 + L_2g_m) + 1}{2C_5L_2g_ms^2 + s^3(2C_2C_5L_2R_2g_m + 4C_2C_5L_2) + s(2C_5R_2g_m + 4C_5)}$$

10.58 INVALID-ORDER-58 $Z(s) = \left(\infty, \frac{L_2s}{C_2L_2s^2+1} + R_2, \infty, \infty, \frac{L_5s}{C_5L_5s^2+1}, \infty \right)$

$$H(s) = \frac{-C_2C_5L_2L_5R_2s^4 - R_2 + s^3(C_2L_2L_5R_2g_m + C_2L_2L_5 - C_5L_2L_5) + s^2(-C_2L_2R_2 - C_5L_5R_2 + L_2L_5g_m) + s(-L_2 + L_5R_2g_m + L_5)}{2C_5L_2L_5g_ms^3 + 2L_2g_ms + 2R_2g_m + s^4(2C_2C_5L_2L_5R_2g_m + 4C_2C_5L_2L_5) + s^2(2C_2L_2R_2g_m + 4C_2L_2 + 2C_5L_5R_2g_m + 4C_5L_5) + 4}$$

10.59 INVALID-ORDER-59 $Z(s) = \left(\infty, \frac{L_2s}{C_2L_2s^2+1} + R_2, \infty, \infty, L_5s + R_5 + \frac{1}{C_5s}, \infty \right)$

$$H(s) = \frac{R_2g_m + s^4(C_2C_5L_2L_5R_2g_m + C_2C_5L_2L_5) + s^3(C_2C_5L_2R_2R_5g_m - C_2C_5L_2R_2 + C_2C_5L_2R_5 + C_5L_2L_5g_m) + s^2(C_2L_2R_2g_m + C_2L_2 + C_5L_2R_5g_m - C_5L_2 + C_5L_5R_2g_m + C_5L_5) + s(C_5R_2R_5g_m - C_5R_2 + C_5R_5 + L_2g_m) + 1}{2C_5L_2g_ms^2 + s^3(2C_2C_5L_2R_2g_m + 4C_2C_5L_2) + s(2C_5R_2g_m + 4C_5)}$$

10.60 INVALID-ORDER-60 $Z(s) = \left(\infty, \frac{L_2s}{C_2L_2s^2+1} + R_2, \infty, \infty, \frac{L_5R_5s}{C_5L_5R_5s^2+L_5s+R_5}, \infty \right)$

$$H(s) = \frac{-C_2C_5L_2L_5R_2R_5s^4 - R_2R_5 + s^3(C_2L_2L_5R_2R_5g_m - C_2L_2L_5R_2 + C_2L_2L_5R_5 - C_5L_2L_5R_5) + s^2(-C_2L_2R_2R_5 - C_5L_5R_2R_5 + L_2L_5R_5g_m - L_2L_5) + s(-L_2R_5 + L_5R_2R_5g_m - L_5R_2 + L_5R_5)}{2R_2R_5g_m + 4R_5 + s^4(2C_2C_5L_2L_5R_2R_5g_m + 4C_2C_5L_2L_5R_5) + s^3(2C_2L_2L_5R_2g_m + 4C_2L_2L_5 + 2C_5L_2L_5R_5g_m) + s^2(2C_2L_2R_2R_5g_m + 4C_2L_2R_5 + 2C_5L_5R_2R_5g_m + 4C_5L_5R_5 + 2L_2L_5g_m) + s(2L_2R_5g_m + 2L_5R_2g_m + 4L_5)}$$

10.61 INVALID-ORDER-61 $Z(s) = \left(\infty, \frac{L_2s}{C_2L_2s^2+1} + R_2, \infty, \infty, \frac{L_5s}{C_5L_5s^2+1} + R_5, \infty \right)$

$$H(s) = \frac{R_2R_5g_m - R_2 + R_5 + s^4(C_2C_5L_2L_5R_2R_5g_m - C_2C_5L_2L_5R_2 + C_2C_5L_2L_5R_5) + s^3(C_2L_2L_5R_2g_m + C_2L_2L_5 + C_5L_2L_5R_5g_m - C_5L_2L_5) + s^2(C_2L_2R_2R_5g_m - C_2L_2R_2 + C_2L_2R_5 + C_5L_5R_2R_5g_m - C_5L_5R_2 + C_5L_5R_5 + L_2L_5g_m) + s(L_2R_5g_m - L_2 + L_5R_2g_m)}{2C_5L_2L_5g_ms^3 + 2L_2g_ms + 2R_2g_m + s^4(2C_2C_5L_2L_5R_2g_m + 4C_2C_5L_2L_5) + s^2(2C_2L_2R_2g_m + 4C_2L_2 + 2C_5L_5R_2g_m + 4C_5L_5) + 4}$$

10.62 INVALID-ORDER-62 $Z(s) = \left(\infty, \frac{L_2 s}{C_2 L_2 s^2 + 1} + R_2, \infty, \infty, \frac{R_5 (C_5 L_5 s^2 + 1)}{C_5 L_5 s^2 + C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{R_2 R_5 g_m - R_2 + R_5 + s^4 (C_2 C_5 L_2 L_5 R_2 R_5 g_m - C_2 C_5 L_2 L_5 R_2 + C_2 C_5 L_2 L_5 R_5) + s^3 (-C_2 C_5 L_2 R_2 R_5 + C_5 L_2 L_5 R_5 g_m - C_5 L_2 L_5) + s^2 (C_2 L_2 R_2 R_5 g_m - C_2 L_2 R_2 + C_2 L_2 R_5 - C_5 L_2 R_5 + C_5 L_5 R_2 R_5 g_m - C_5 L_5 R_2 + C_5 L_5 R_5) + s (-C_5 R_2 R_5 + L_2 R_5 g_m - L_2)}{2 R_2 g_m + s^4 (2 C_2 C_5 L_2 L_5 R_2 g_m + 4 C_2 C_5 L_2 L_5) + s^3 (2 C_2 C_5 L_2 R_2 R_5 g_m + 4 C_2 C_5 L_2 R_5 + 2 C_5 L_2 L_5 g_m) + s^2 (2 C_2 L_2 R_2 g_m + 4 C_2 L_2 + 2 C_5 L_2 R_5 g_m + 2 C_5 L_5 R_2 g_m + 4 C_5 L_5) + s (2 C_5 R_2 R_5 g_m + 4 C_5 R_5 + 2 L_2 g_m) + 4}$$

10.63 INVALID-ORDER-63 $Z(s) = \left(\infty, \frac{R_2 (C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_2 R_2 s^3 + R_2 g_m + s^2 (C_2 L_2 R_2 g_m + C_2 L_2) + s (C_2 R_2 - C_5 R_2) + 1}{4 C_2 C_5 R_2 s^2 + s^3 (2 C_2 C_5 L_2 R_2 g_m + 4 C_2 C_5 L_2) + s (2 C_5 R_2 g_m + 4 C_5)}$$

10.64 INVALID-ORDER-64 $Z(s) = \left(\infty, \frac{R_2 (C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_2 R_2 R_5 s^3 + R_2 R_5 g_m - R_2 + R_5 + s^2 (C_2 L_2 R_2 R_5 g_m - C_2 L_2 R_2 + C_2 L_2 R_5) + s (C_2 R_2 R_5 - C_5 R_2 R_5)}{2 R_2 g_m + s^3 (2 C_2 C_5 L_2 R_2 R_5 g_m + 4 C_2 C_5 L_2 R_5) + s^2 (4 C_2 C_5 R_2 R_5 + 2 C_2 L_2 R_2 g_m + 4 C_2 L_2) + s (4 C_2 R_2 + 2 C_5 R_2 R_5 g_m + 4 C_5 R_5) + 4}$$

10.65 INVALID-ORDER-65 $Z(s) = \left(\infty, \frac{R_2 (C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, R_5 + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{R_2 g_m + s^3 (C_2 C_5 L_2 R_2 R_5 g_m - C_2 C_5 L_2 R_2 + C_2 C_5 L_2 R_5) + s^2 (C_2 C_5 R_2 R_5 + C_2 L_2 R_2 g_m + C_2 L_2) + s (C_2 R_2 + C_5 R_2 R_5 g_m - C_5 R_2 + C_5 R_5) + 1}{4 C_2 C_5 R_2 s^2 + s^3 (2 C_2 C_5 L_2 R_2 g_m + 4 C_2 C_5 L_2) + s (2 C_5 R_2 g_m + 4 C_5)}$$

10.66 INVALID-ORDER-66 $Z(s) = \left(\infty, \frac{R_2 (C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, L_5 s + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{R_2 g_m + s^4 (C_2 C_5 L_2 L_5 R_2 g_m + C_2 C_5 L_2 L_5) + s^3 (-C_2 C_5 L_2 R_2 + C_2 C_5 L_5 R_2) + s^2 (C_2 L_2 R_2 g_m + C_2 L_2 + C_5 L_5 R_2 g_m + C_5 L_5) + s (C_2 R_2 - C_5 R_2) + 1}{4 C_2 C_5 R_2 s^2 + s^3 (2 C_2 C_5 L_2 R_2 g_m + 4 C_2 C_5 L_2) + s (2 C_5 R_2 g_m + 4 C_5)}$$

10.67 INVALID-ORDER-67 $Z(s) = \left(\infty, \frac{R_2 (C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_2 L_5 R_2 s^4 - R_2 + s^3 (C_2 L_2 L_5 R_2 g_m + C_2 L_2 L_5) + s^2 (-C_2 L_2 R_2 + C_2 L_5 R_2 - C_5 L_5 R_2) + s (L_5 R_2 g_m + L_5)}{4 C_2 C_5 L_5 R_2 s^3 + 4 C_2 R_2 s + 2 R_2 g_m + s^4 (2 C_2 C_5 L_2 L_5 R_2 g_m + 4 C_2 C_5 L_2 L_5) + s^2 (2 C_2 L_2 R_2 g_m + 4 C_2 L_2 + 2 C_5 L_5 R_2 g_m + 4 C_5 L_5) + 4}$$

10.68 INVALID-ORDER-68 $Z(s) = \left(\infty, \frac{R_2 (C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, L_5 s + R_5 + \frac{1}{C_5 s}, \infty \right)$

$$H(s) = \frac{R_2 g_m + s^4 (C_2 C_5 L_2 L_5 R_2 g_m + C_2 C_5 L_2 L_5) + s^3 (C_2 C_5 L_2 R_2 R_5 g_m - C_2 C_5 L_2 R_2 + C_2 C_5 L_2 R_5 + C_2 C_5 L_5 R_2) + s^2 (C_2 C_5 R_2 R_5 + C_2 L_2 R_2 g_m + C_2 L_2 + C_5 L_5 R_2 g_m + C_5 L_5) + s (C_2 R_2 + C_5 R_2 R_5 g_m - C_5 R_2 + C_5 R_5) + 1}{4 C_2 C_5 R_2 s^2 + s^3 (2 C_2 C_5 L_2 R_2 g_m + 4 C_2 C_5 L_2) + s (2 C_5 R_2 g_m + 4 C_5)}$$

10.69 INVALID-ORDER-69 $Z(s) = \left(\infty, \frac{R_2 (C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 R_5 s}{C_5 L_5 s^2 + L_5 s + R_5}, \infty \right)$

$$H(s) = \frac{-C_2 C_5 L_2 L_5 R_2 R_5 s^4 - R_2 R_5 + s^3 (C_2 L_2 L_5 R_2 R_5 g_m - C_2 L_2 L_5 R_2 + C_2 L_2 L_5 R_5) + s^2 (-C_2 L_2 R_2 R_5 + C_2 L_5 R_2 R_5 - C_5 L_5 R_2 R_5) + s (L_5 R_2 R_5 g_m - L_5 R_2 + L_5 R_5)}{2 R_2 R_5 g_m + 4 R_5 + s^4 (2 C_2 C_5 L_2 L_5 R_2 R_5 g_m + 4 C_2 C_5 L_2 L_5 R_5) + s^3 (4 C_2 C_5 L_5 R_2 R_5 + 2 C_2 L_2 L_5 R_2 g_m + 4 C_2 L_2 L_5) + s^2 (2 C_2 L_2 R_2 R_5 g_m + 4 C_2 L_2 R_5 + 4 C_2 L_5 R_2 + 2 C_5 L_5 R_2 R_5 g_m + 4 C_5 L_5 R_5) + s (4 C_2 R_2 R_5 + 2 L_5 R_2 g_m + 4 L_5)}$$

10.70 INVALID-ORDER-70 $Z(s) = \left(\infty, \frac{R_2 (C_2 L_2 s^2 + 1)}{C_2 L_2 s^2 + C_2 R_2 s + 1}, \infty, \infty, \frac{L_5 s}{C_5 L_5 s^2 + 1} + R_5, \infty \right)$

$$H(s) = \frac{R_2 R_5 g_m - R_2 + R_5 + s^4 (C_2 C_5 L_2 L_5 R_2 R_5 g_m - C_2 C_5 L_2 L_5 R_2 + C_2 C_5 L_2 L_5 R_5) + s^3 (C_2 C_5 L_5 R_2 R_5 + C_2 L_2 L_5 R_2 g_m + C_2 L_2 L_5) + s^2 (C_2 L_2 R_2 R_5 g_m - C_2 L_2 R_2 + C_2 L_2 R_5 + C_2 L_5 R_2 + C_5 L_5 R_2 R_5 g_m - C_5 L_5 R_2 + C_5 L_5 R_5) + s (C_2 R_2 R_5 + L_5 R_2 g_m + L_5)}{4 C_2 C_5 L_5 R_2 s^3 + 4 C_2 R_2 s + 2 R_2 g_m + s^4 (2 C_2 C_5 L_2 L_5 R_2 g_m + 4 C_2 C_5 L_2 L_5) + s^2 (2 C_2 L_2 R_2 g_m + 4 C_2 L_2 + 2 C_5 L_5 R_2 g_m + 4 C_5 L_5) + 4}$$

10.71 INVALID-ORDER-71 $Z(s) = \left(\infty, \frac{R_2(C_2L_2s^2+1)}{C_2L_2s^2+C_2R_2s+1}, \infty, \infty, \frac{R_5(C_5L_5s^2+1)}{C_5L_5s^2+C_5R_5s+1}, \infty \right)$

$$H(s) = \frac{R_2R_5g_m - R_2 + R_5 + s^4(C_2C_5L_2L_5R_2R_5g_m - C_2C_5L_2L_5R_2 + C_2C_5L_2L_5R_5) + s^3(-C_2C_5L_2R_2R_5 + C_2C_5L_5R_2R_5) + s^2(C_2L_2R_2R_5g_m - C_2L_2R_2 + C_2L_2R_5 + C_5L_5R_2R_5g_m - C_5L_5R_2 + C_5L_5R_5) + s(C_2R_2R_5 - C_5R_2R_5)}{2R_2g_m + s^4(2C_2C_5L_2L_5R_2g_m + 4C_2C_5L_2L_5) + s^3(2C_2C_5L_2R_2R_5g_m + 4C_2C_5L_2R_5 + 4C_2C_5L_5R_2) + s^2(4C_2C_5R_2R_5 + 2C_2L_2R_2g_m + 4C_2L_2 + 2C_5L_5R_2g_m + 4C_5L_5) + s(4C_2R_2 + 2C_5R_2R_5g_m + 4C_5R_5) + 4}$$

11 PolynomialError