

$$1 \quad \text{Examined } H(z) \text{ for TIA full parasitic Z5 ZL: } \frac{Z_{L1}(C_{g2}s - g_m)(Z_{5g}r_{f5} + Z_5 - r_o)}{C_{g2}^2C_{Y5}Z_5Z_{L1}r_o^2s^3 + C_{g2}^2Z_5Z_{L1}g_m r_o^2s^3 + C_{g2}^2Z_5Z_{L1}r_o s^2 + 3C_{g2}^2Z_{L1}r_o s^2 - C_{g2}C_{Y5}Z_5Z_{L1}g_m r_o^2s^2 + C_{g2}C_{Y5}Z_5Z_{L1}r_o s^2 + C_{g2}C_{Y5}Z_5Z_{L1}r_o s + C_{g2}C_{Y5}Z_5r_o^2s^2 + 2C_{g2}C_{Y5}Z_{L1}r_o^2s^2 + C_{g2}C_{Y5}Z_{L1}r_o s^2 - C_{g2}Z_5Z_5Z_{L1}g_m r_o^2s^2 - C_{g2}Z_5Z_{L1}g_m r_o s + C_{g2}Z_5g_m r_o^2s^2 + 2C_{g2}Z_5g_m r_o s + C_{g2}Z_5r_o s + 2C_{g2}Z_{L1}g_m r_o^2s + C_{g2}Z_{L1}g_m r_o s + 2C_{g2}Z_{L1}r_o s + 6C_{g2}Z_{L1}s + C_{g2}Z_{L1}r_o s - C_{Y5}Z_5Z_{L1}g_m r_o s + C_{Y5}Z_5g_m r_o s + C_{Y5}Z_5r_o s + C_{Y5}Z_{L1}g_m r_o s + 2C_{Y5}Z_{L1}r_o s + 2C_{Y5}Z_{L1}s - Z_5g_m r_o - Z_5g_m - 2Z_{L1}g_m^2r_o - 4Z_{L1}g_m - g_m r_o}$$

$$H(z) = \frac{Z_{L1}(C_{g2}s - g_m)(Z_{5g}r_{f5} + Z_5 - r_o)}{C_{g2}^2C_{Y5}Z_5Z_{L1}r_o^2s^3 + C_{g2}^2Z_5Z_{L1}g_m r_o^2s^3 + C_{g2}^2Z_5Z_{L1}r_o s^2 + 3C_{g2}^2Z_{L1}r_o s^2 - C_{g2}C_{Y5}Z_5Z_{L1}g_m r_o^2s^2 + C_{g2}C_{Y5}Z_5Z_{L1}r_o s^2 + C_{g2}C_{Y5}Z_5Z_{L1}r_o s + C_{g2}C_{Y5}Z_5r_o^2s^2 + 2C_{g2}C_{Y5}Z_{L1}r_o^2s^2 + C_{g2}C_{Y5}Z_{L1}r_o s^2 - C_{g2}Z_5Z_5Z_{L1}g_m r_o^2s^2 - C_{g2}Z_5Z_{L1}g_m r_o s + C_{g2}Z_5g_m r_o^2s^2 + 2C_{g2}Z_5g_m r_o s + C_{g2}Z_5r_o s + 2C_{g2}Z_{L1}g_m r_o^2s + C_{g2}Z_{L1}g_m r_o s + 2C_{g2}Z_{L1}r_o s + 6C_{g2}Z_{L1}s + C_{g2}Z_{L1}r_o s - C_{Y5}Z_5Z_{L1}g_m r_o s + C_{Y5}Z_5g_m r_o s + C_{Y5}Z_5r_o s + C_{Y5}Z_{L1}g_m r_o s + 2C_{Y5}Z_{L1}r_o s + 2C_{Y5}Z_{L1}s - Z_5g_m r_o - 2Z_{L1}g_m^2r_o - 4Z_{L1}g_m - g_m r_o}$$

2 HP

3 BP

4 LP

5 BS

6 GE

7 AP

8 INVALID-NUMER

9 INVALID-WZ

10 INVALID-ORDER

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

$$H(s) = \frac{R_L(C_{g0}s - g_{m0})(R_0g_{m0}r_o + R_5r_o)}{C_{g0}^2C_{g0}R_0R_Lr_0^2s^3 + C_{g0}^2R_0R_LR_1g_{m0}r_0^2s^2 + C_{g0}^2R_0R_1R_Lr_0s^2 + 3C_{g0}^2R_LR_1r_0s^2 - C_{g0}C_{g0}R_0R_1L_1g_{m0}r_0s^2 - C_{g0}C_{g0}R_0R_1L_1r_0s^2 + C_{g0}C_{g0}R_0R_1r_0s^2 + 2C_{g0}C_{g0}R_0R_1r_0s^2 + C_{g0}C_{g0}R_LR_1r_0s^2 - C_{g0}R_0R_LR_1g_{m0}r_0s^2 - C_{g0}R_0R_LL_1g_{m0}r_0s^2 + C_{g0}R_LR_1r_0s^2 + C_{g0}R_0R_1r_0s^2 + C_{g0}R_LR_1r_0s^2 + 6C_{g0}R_Lr_0s - C_{g0}R_0R_LL_1g_{m0}r_0s + C_{g0}R_0R_1r_0s + C_{g0}R_Lg_{m0}r_0s + C_{g0}R_0r_0s + C_{g0}R_Lr_0s + 2C_{g0}R_Lr_0s + 2C_{g0}R_Lr_0s - R_0g_{m0}^2r_o - R_Lg_{m0} - 2R_LR_1g_{m0}^2r_o - 4R_LR_1g_{m0}r_0}$$

10.2 INVALID-ORDER-2 $Z(s) = \left(\infty, \infty, \infty, \infty, R_5, \frac{1}{C_L s} \right)$

[illegible]

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

[illegible]

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

[illegible]

10.5 INVALID-ORDER-5 $Z(s) = \left(\infty, \infty, \infty, \infty, R_5, L_L s + \frac{1}{C_L s} \right)$

[illegible]

10.6 INVALID-ORDER-6 $Z(s) = \left(\infty, \infty, \infty, \infty, R_5, \frac{L_L s}{C_L L_L s^2 + 1} \right)$

[illegible]

10.7 INVALID-ORDER-7 $Z(s) = \left(\infty, \infty, \infty, \infty, R_5, L_L s + R_L + \frac{1}{C_L s} \right)$

$$H(s) = C_{L1}C_{L2}^2C_{L3}C_{L4}R_5R_7r_2^{*2}s^8 + C_{L1}C_{L2}^2C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 + C_{L1}C_{L2}^2C_{L4}R_5R_7m_2^{*2}s^8 + C_{L1}C_{L2}^2C_{L4}R_5R_7r_2^{*2}s^8 + 3C_{L1}C_{L2}^2C_{L4}Lr_7r_8^{*2}s^8 + C_{L1}C_{L2}^2C_{L4}R_5R_7Lr_8^{*2}s^8 + C_{L1}C_{L2}^2C_{L4}R_5R_7Lr_8^{*2}s^8 - C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7m_2^{*2}s^8 + C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7r_2^{*2}s^8 + 2C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7r_2^{*2}s^8 + C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7r_2^{*2}s^8 - C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 - C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 + C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 + C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 + 2C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 + C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 - C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 - C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 + C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 + 6C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 - C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8 - C_{L1}C_{L2}C_{L3}C_{L4}R_5R_7Lr_2^{*2}s^8$$

10.8 INVALID-ORDER-8 $Z(s) = \left(\infty, \infty, \infty, \infty, R_5, \frac{1}{C_L s + \frac{1}{R_L + \frac{1}{L_L s}}} \right)$

[illegible]

10.9 INVALID-ORDER-9 $Z(s) = \left(\infty, \infty, \infty, \infty, R_5, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$

[illegible]

10.10 INVALID-ORDER-10 $Z(s) = \left(\infty, \infty, \infty, \infty, R_5, \frac{R_L \left(L_L s + \frac{1}{C_L s} \right)}{L_L s + R_L + \frac{1}{C_L s}} \right)$

[illegible]

10.11 INVALID-ORDER-11 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_5 s}, R_L \right)$

[illegible]

10.12 INVALID-ORDER-12 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_5 s}, \frac{1}{C_L s} \right)$

$$H(s) = \frac{(g_{98} - g_m)(-C_5 v_{98} + g_m r_o + 1)}{s(C_5 C_{L1} C_{98} v_{98} s^2 - C_5 C_{L2} g_{m98} v_{98} s + C_5 C_{98} C_{98} v_{98} s^2 + 2 C_5 C_{98} C_{98} v_{98} s^2 + C_5 C_{98} C_{98} v_{98} s^2 + 2 C_5 g_{98} g_{m98} v_{98} s + 2 C_5 C_{98} v_{98} s + 2 C_5 C_{98} s - 2 C_5 g_{98}^2 v_{98} - 4 C_{98} s + C_{L1} C_{98} C_{98} v_{98} s^2 + C_{L1} C_{98} g_{m98} v_{98} s + C_{L1} C_{98} g_{m98} v_{98} s + C_{L1} C_{98} v_{98} s + 2 C_{L1} C_{98} s + C_{L1} C_{98} g_{m98} v_{98} s + C_{L1} C_{98} v_{98} s + C_{L1} C_{98} s - C_{L1} g_{98}^2 v_{98} - C_{L1} g_{98} s + C_{98}^2 C_{98} v_{98} s^2 + C_{98}^2 g_{m98} v_{98} s^2 + C_{98}^2 g_{98} - C_{98} C_{98} g_{m98} v_{98} s^2 + C_{98} C_{98} v_{98} s - C_{98} g_{98}^2 v_{98} - C_{98} g_{m98} v_{98} s - C_{98} g_{m98} s)$$

10.13 INVALID-ORDER-13 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_{5s}}, \frac{R_L}{C_{RL}s+1} \right)$

[illegible]

10.14 INVALID-ORDER-14 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_5 s}, R_L + \frac{1}{C_L s} \right)$

$$H(s) = \frac{(C_{gd}s - g_m)(C_L R_L s + 1)(-C_5 r_o s + g_m r_o + 1)}{s \left(3C_3 C_1 C_{gd} R_L r_o s^3 + 2C_3 C_1 C_{gd} C_{gs} R_L r_o^2 s^3 + C_5 C_1 C_{gd} C_{gs} R_L r_o s^3 + 2C_3 C_1 C_{gd} R_L g_m r_o^2 s^2 + C_5 C_1 C_{gd} R_L g_m r_o s^2 + 2C_5 C_1 C_{gd} R_L r_o s^2 + 6C_5 C_1 C_{gd} R_L s^2 + C_5 C_1 C_{gd} r_o s^2 + C_5 C_1 C_{gs} R_L g_m r_o s^2 + 2C_5 C_1 C_{gd} C_{gs} R_L r_o s^2 + 2C_5 C_1 C_{gs} R_L s^2 - 2C_5 C_1 R_L g_m r_o s - 4C_5 C_1 R_L g_m s - C_5 C_L g_m r_o s + 3C_5 C_{gd}^2 r_o s^2 + 2C_5 C_{gd} C_{gs} r_o s^2 + C_5 C_{gd} C_{gs} r_o s^2 + 2C_5 C_{gd} g_m r_o s + C_5 C_{gd} g_m r_o s + 2C_5 C_{gd} r_o s + 2C_5 C_{gs} r_o s + 2C_5 C_{gs} r_o s - 2C_5 g_m r_o - 4 \right)}$$

10.15 INVALID-ORDER-15 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_5 s}, L_L s + \frac{1}{C_L s} \right)$

$$H(s) = \frac{(C_{gd}s - g_m)(C_L Ls^2 + 1)(-C_5 r_o s + g_m r_o + 1)}{s \left[3C_5 C_L C_{gd}^2 L L r_o s^4 + 2C_5 C_L C_{gd} C_{gs} L L r_o^2 s^4 + C_5 C_L C_{gd} C_{gs} L L r_o s^4 + 2C_5 C_L C_{gd} L L g_m r_o^2 s^3 + C_5 C_L C_{gd} L L g_m r_o s^3 + 2C_5 C_L C_{gd} L L r_o s^3 + 6C_5 C_L C_{gd} L L s^3 + C_5 C_L C_{gd} r_o s^2 + C_5 C_L C_{gs} L L g_m r_o s^3 + 2C_5 C_L C_{gs} L L r_o s^3 + 2C_5 C_L C_{gs} L L s^3 - 2C_5 C_L L L g_o^2 r_o s^2 - 4C_5 C_L L L g_m s^2 - C_5 C_L g_m r_o s + 3C_5 C_{gd}^2 r_o s^2 + 2C_5 C_{gd} C_{gs} r_o s^2 + C_5 C_{gd} C_{gs} r_o s^2 + 2C_5 C_{gd} g_m r_o s + C_5 C_{gd} g_m r_o s + 2C_5 C_{gd} r_o s + 6C_5 C_{gd} s + C_5 C_{gs} g_m r_o s + 2C_5 C_{gs} r_o s - 2C_5 g_o r_o - 4C_5 g_o \right]}$$

10.16 INVALID-ORDER-16 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_5 s}, \frac{L_L s}{C_L L_L s^2 + 1} \right)$

$$H(s) = \frac{L_L C_g (s g_d s - g_m) (-C_5 r_{\phi s} + g_m r_{\phi} + 1)}{C_5 C_L C_{gd} L_L r_{\phi} s^4 - C_5 C_L L_L g_m r_{\phi} s^3 + 3 C_5 C_{gd}^2 L_L r_{\phi} s^4 + 2 C_5 C_{gd} C_{g_d} L_L r_{\phi}^2 s^4 + C_5 C_{gd} C_{g_d} L_L r_{\phi} s^4 + 2 C_5 C_{gd} L_L g_m r_{\phi}^2 s^3 + C_5 C_{gd} L_L g_m r_{\phi} s^3 + 2 C_5 C_{gd} L_L r_{\phi} s^3 + 2 C_5 C_{g_d} L_L g_m r_{\phi} s^3 + 2 C_5 C_{g_d} L_L r_{\phi} s^3 + 2 C_5 C_{g_d} L_L s^3 - 2 C_5 L_L g_m^2 r_{\phi} s^2 - 4 C_5 L_L g_m s^2 - C_5 g_m r_{\phi} s + C_L C_{gd} C_{g_d} L_L r_{\phi}^2 s^4 + C_L C_{gd} L_L g_m r_{\phi}^2 s^3 + 2 C_L C_{gd} L_L g_m r_{\phi} s^3 + C_L C_{gd} L_L r_{\phi} s^3 + 2 C_L C_{g_d} L_L r_{\phi} s^3 + 2 C_L C_{g_d} L_L s^3}$$

10.17 INVALID-ORDER-17 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_5 s}, L_L s + R_L + \frac{1}{C_L s} \right)$

$$H(s) = s \left(3C_3C_{L_1}C_{g_d}^2L_{L_1}r_o s^4 + 3C_3C_{L_1}C_{g_d}^2R_{L_1}r_o s^3 + 2C_5C_{L_1}C_{g_d}C_{g_s}L_{L_1}r_o^2 s^4 + C_5C_{L_1}C_{g_d}C_{g_s}L_{L_1}r_o s^4 + 2C_5C_{L_1}C_{g_d}C_{g_s}R_{L_1}r_o^2 s^3 + C_5C_{L_1}C_{g_d}C_{g_s}R_{L_1}r_o s^3 + 2C_5C_{L_1}C_{g_d}L_{L_1}g_{m_r}r_o^2 s^3 + C_5C_{L_1}C_{g_d}L_{L_1}g_{m_r}r_o s^3 + 2C_5C_{L_1}C_{g_d}R_{L_1}r_o s^3 + 6C_5C_{L_1}C_{g_d}L_{L_1}s^3 + 2C_5C_{L_1}C_{g_d}R_{L_1}g_{m_r}r_o^2 s^2 + C_5C_{L_1}C_{g_d}R_{L_1}g_{m_r}r_o s^2 + 2C_5C_{L_1}C_{g_d}R_{L_1}r_o s^2 + 6C_5C_{L_1}C_{g_d}R_{L_1}s^2 + C_5C_{L_1}C_{g_d}r_o s^2 + C_5C_{L_1}C_{g_s}L_{L_1}g_{m_r}r_o s^3 + 2C_5C_{L_1}C_{g_s}L_{L_1}r_o s^3 + 2C_5C_{L_1}C_{g_s}L_{L_1}s^3 + C_5C_{L_1}C_{g_s}R_{L_1}g_{m_r}r_o s^2 + 2C_5C_{L_1}C_{g_s}R_{L_1}r_o s^2 + 2C_5C_{L_1}C_{g_s}R_{L_1}s^2 - 2C_3C_{L_1}L_{L_1}g_{m_r}^2r_o s^2 - 4C_5C_{L_1}L_{L_1}g_{m_r}^2s^2 - 2C_5C_{L_1}L_{L_1}g_{m_r}^2r_o s - 4C_5C_{L_1}L_{L_1}g_{m_r}s - C_5C_{L_1}L_{L_1}g_{m_r} - C_5C_{L_1}L_{L_1}r_o s - C_5C_{L_1}L_{L_1}r_o - C_5C_{L_1}L_{L_1} \right)$$

10.18 INVALID-ORDER-18 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_{5s}}, \frac{1}{C_L s + \frac{1}{R_L + \frac{1}{L_L s}}} \right)$

$$H(s) = \frac{L_L R_L s(C_{gd}s - g_m)(-C_3 r_o s + g_m r_o + 1)}{C_5 C_L C_{gd} L_L R_L r_o s^4 - C_5 C_L L_L R_L g_m r_o s^3 + 3C_5^2 C_{gd}^2 L_L R_L r_o s^4 + 2C_5 C_{gd} C_{gs} L_L R_L r_o s^4 + C_5 C_{gd} C_{gs} L_L R_L r_o s^4 + 2C_5 C_{gd} L_L R_L g_m r_o s^3 + C_5 C_{gd} L_L R_L g_m r_o s^3 + 2C_5 C_{gd} L_L R_L r_o s^3 + 6C_5^2 C_{gd} L_L R_L r_o s^3 + C_5 C_{gd} L_L R_L r_o s^3 + C_5 C_{gd} L_L R_L r_o s^3 + C_5 C_{gs} L_L R_L r_o s^3 + 2C_5 C_{gs} L_L R_L r_o s^3 + 2C_5 L_L R_L g_m^2 r_o s^3 - 4C_5 L_L R_L g_m s^2 - C_5 L_L g_m r_o s^2 - C_5 L_L g_m r_o s^2 + C_1 C_{gd} C_{gs} L_L R_L r_o s^2 + C_1 C_{gd} L_L R_L r_o s^2 + 2C_1 C_{gd} L_L R_L g_m r_o s^3 + C_1 C_{gd} L_L R_L r_o s^3 + 2C_1 C_{gd} L_L R_L r_o s^3 + C_1 C_{gs} L_L R_L g_m r_o s^3 + C_1 C_{gs} L_L R_L r_o s^3 + C_1 C_{gd} L_L R_L r_o s^3 -$$

10.19 INVALID-ORDER-19 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{1}{C_5 s}, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$

$$H(s) = \frac{1}{3C_5C_LC_{gd}^2L_LL_LR_o s^4 + 2C_5C_LC_{gd}C_{g9}L_LR_LR_o^2s^5 + C_5C_LC_{gd}C_{g9}L_LR_LR_o s^4 + 2C_5C_LC_{gd}L_LR_Lg_m^2s^4 + C_5C_LC_{gd}L_LR_Lg_mR_o s^4 + 2C_5C_LC_{gd}L_LR_LR_o s^4 + 6C_5C_LC_{gd}L_LR_LR_o s^4 + C_5C_LC_{gd}L_LR_Lg_m^2s^4 + C_5C_LC_{g9}L_LR_Lg_mR_o s^4 + 2C_5C_LC_{g9}L_LR_LR_o s^4 + 2C_5C_LC_{g9}L_LR_LR_o s^4 + 2C_5C_LC_{g9}L_LR_LR_o s^4 - 2C_5C_LL_LR_Lg_m^2R_o s^3 - 4C_5C_LL_LR_Lg_m s^3 - C_5C_LL_Lg_mR_o s^3 + 3C_5C_{gd}^2L_LR_o s^4 + 3C_5C_{gd}^2L_LR_o s^3 + 2C_5C_{gd}C_{g9}L_LR_o^2s^4 + C_5C_{gd}C_{g9}L_LR_o s^4 + 2C_5C_{gd}C_{g9}R_LR_o^2s^3 + C_5C_{gd}C_{g9}R_LR_o s^3 + 2C_5C_{gd}L_LR_Lg_m^2s^3 + C_5C_{gd}L_LR_Lg_mR_o s^3 + 2C_5C_{gd}L_LR_o s^3 + 6C_5C_{gd}L_LR_o s^3 + 2C_5C_{gd}R_LR_o s^3}$$

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

$$H(s) = \frac{3C_5C_1C_{gd}^2L_dL_1R_Lr_o s^5 + 2C_5C_1C_{gd}C_{gs}L_1R_Lr_o^2s^5 + C_5C_1C_{gd}C_{gs}L_1R_Lr_o s^5 + 2C_5C_1C_{gd}L_1R_Lgm r_o^2s^4 + C_5C_1C_{gd}L_1R_Lgm r_o s^4 + 2C_5C_1C_{gd}L_1R_Lr_o s^4 + 6C_5C_1C_{gd}L_1R_Ls^4 + C_5C_1C_{gd}L_1R_o s^4 + C_5C_1C_{gd}R_dL_1r_o s^3 + C_5C_1C_{gs}L_1R_Lgm r_o s^4 + 2C_5C_1C_{gs}L_1R_Lr_o s^4 + 2C_5C_1C_{gs}L_1R_Ls^4 - 2C_5C_1L_1L_1R_Lgm^2r_o s^3 - 4C_5C_1L_1L_1R_Lgm s^3 - C_5C_1L_1L_1gm r_o s^3 - C_5C_1L_1gm r_o s^3 + 3C_5C_{gd}^2L_dR_o s^3 + 2C_5C_{gd}C_{gs}R_Lr_o^2s^3 + C_5C_{gd}C_{gs}R_Lr_o s^3 + 2C_5C_{gd}R_Lgm r_o^2s^2 + C_5C_{gd}R_Lgm r_o s^2 + 2C_5C_{gd}R_Lr_o s^2 + 6C_5C_{gd}R_Ls^2 + C_5C_{gd}r_o s^2 + C_5C_{gs}R_Lgm r_o s^2}{}$$

10.21 INVALID-ORDER-21 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, R_L \right)$

[illegible]

10.22 INVALID-ORDER-22 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \frac{1}{C_L s} \right)$

$$H(s) = - \frac{(C_{gd}s - g_m)(C_5R_5r_o s - R_5g_m r_o - R_5 + r_o)}{C_5C_LC_{gd}R_5r_o s^6 - C_5C_LR_5g_m r_o s^5 + 3C_5C_{gd}^2R_5r_o s^4 + 2C_5C_gC_{gd}C_gR_5r_o s^3 + C_5C_{gd}C_gR_5r_o s^3 + 2C_5C_{gd}R_5g_m r_o s^2 + 2C_5C_gR_5r_o s^2 + 6C_5C_{gd}R_5s^2 + C_5C_{gd}R_5g_m r_o s^2 + 2C_5C_gR_5r_o s^2 + 2C_5C_gR_5s^2 - 2C_5R_5g_m r_o s - 4C_5R_5g_m s + C_LC_{gd}C_gR_5r_o s^5 + C_LC_{gd}R_5g_m r_o s^4 + C_LC_{gd}R_5g_m r_o s^2 + 2C_LC_{gd}R_5r_o s^2 + C_LC_{gd}R_5s^2 + C_LC_{gd}r_o s^2 + C_LC_gR_5g_m r_o s^2 + C_LC_gR_5r_o s^2 + C_LC_gR_5s^2}$$

10.23 INVALID-ORDER-23 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \frac{R_L}{C_L R_L s + 1} \right)$

$$H(s) = -\frac{R_L(C_{gd}s - g_m)(C_5C_3\tau_{os} - R_5g_m\tau_o)}{C_5C_LC_{gd}R_5R_L\tau_{os}^3 - C_5C_LR_5R_Lg_m\tau_{os}^2 + 3C_5C_{gd}^2R_5R_L\tau_{os}^3 + 2C_5C_{gd}C_gR_5R_L\tau_{os}^3 + C_5C_{gd}C_gR_5R_L\tau_{os}^3 + 2C_5C_{gd}R_5R_Lg_m\tau_{os}^2 + 2C_5C_{gd}R_5R_L\tau_{os}^2 + 6C_5C_{gd}R_5R_L\tau_{os}^2 + C_5C_{gd}R_5\tau_{os}^2 + C_5C_gR_5R_Lg_m\tau_{os}^2 + 2C_5C_gR_5R_L\tau_{os}^2 + 2C_5C_gR_5R_L\tau_{os}^2 - 2C_5R_5R_Lg_m^2\tau_{os} - 4C_5R_5R_Lg_m\tau_{os} - C_5R_5g_m\tau_{os} + C_LC_{gd}C_gR_5R_L\tau_{os}^3 + C_LC_{gd}R_5R_Lg_m\tau_{os}^2 + 2C_LC_{gd}R_5R_Lg_m\tau_{os}^2 + 2C_LC_{gd}R_5R_L\tau_{os}^2 + C_LC_{gd}R_5R_L\tau_{os}^2 + C_LC_gR_5R_Lg_m\tau_{os}^2 + C_LC_gR_5R_L\tau_{os}^2 + C_LC_gR_5R_L\tau_{os}^2 - C_LR_5R_Lg_m^2\tau_{os} - C_LR_5R_Lg_m\tau_{os} - C_LR_5R_L\tau_{os}}$$

10.24 INVALID-ORDER-24 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, R_L + \frac{1}{C_L s} \right)$

$$H(s) = -3C_5C_LC_{gd}^2R_5R_Lr_0s^4 + 2C_5C_LC_{gd}C_{gs}R_5R_Lr_0^2s^4 + C_5C_LC_{gd}C_{gs}R_5R_Lr_0s^4 + 2C_5C_LC_{gd}R_5R_Lg_mr_0^3s^3 + C_5C_LC_{gd}R_5R_Lg_mr_0s^3 + 2C_5C_LC_{gd}R_5R_Lr_0s^3 + 6C_5C_LC_{gd}R_5R_Ls^3 + C_5C_LC_{gd}R_5r_0s^3 + C_5C_LC_{gs}R_5R_Lg_mr_0s^3 + 2C_5C_LC_{gs}R_5R_Lr_0s^3 + 2C_5C_LC_{gs}R_5R_Ls^3 - 2C_5C_LR_5R_Lg_m^2r_0s^2 - 4C_5C_LR_5R_Lg_ms^2 - C_5C_LR_5g_mr_0s^2 + 3C_5C_{gd}^2R_5r_0s^3 + 2C_5C_{gd}C_{gs}R_5r_0s^3 + C_5C_{gd}C_{gs}R_5r_0s^3 + 2C_5C_{gd}R_5g_mr_0s^2 + C_5C_{gd}R_5g_ms^2 + 2C_5C_{gd}R_5r_0s^2 + 6C_5C_{gd}R_5s^2 + C_5C_{gs}R_5g_mr_0s^2 + 2C_5C_{gs}R_5r_0s^2 + 2C_5C_{gs}R_5s^2 - 2C_5R_5g_m^2r_0s - 4C_5R_5g_ms^2 - 4C_5R_5g_mr_0s^2 - 4C_5R_5s^2$$

10.25 INVALID-ORDER-25 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, L_L s + \frac{1}{C_L s} \right)$

$$H(s) = -3C_5 C_L C_{gd}^2 L_L R_5 r_o s^5 + 2C_5 C_L C_{gq} C_{gs} L_L R_5 r_o^2 s^5 + C_5 C_L C_{gd} C_{gs} L_L R_5 r_o s^5 + 2C_5 C_L C_{gd} L_L R_5 g_m r_o^2 s^4 + C_5 C_L C_{gd} L_L R_5 g_m r_o s^4 + 2C_5 C_L C_{gd} L_L R_5 r_o s^4 + 6C_5 C_L C_{gd} L_L R_5 s^4 + C_5 C_L C_{gd} R_5 r_o s^3 + C_5 C_L C_{gs} L_L R_5 g_m r_o s^4 + 2C_5 C_L C_{gs} L_L R_5 r_o s^4 + 2C_5 C_L C_{gs} L_L R_5 s^4 - 2C_5 C_L L_L R_5 g_m^2 r_o s^3 - 4C_5 C_L L_L R_5 g_m s^3 - C_5 C_L R_5 g_m r_o s^2 + 3C_5 C_{gd}^2 R_5 r_o s^3 + 2C_5 C_{gd} C_{gs} R_5 r_o^2 s^3 + C_5 C_{gd} C_{gs} R_5 r_o s^3 + 2C_5 C_{gd} R_5 g_m r_o^2 s^2 + C_5 C_{gd} R_5 g_m r_o s^2 + 2C_5 C_{gd} R_5 r_o s^2 + 6C_5 C_{gd} R_5 s^2 + C_5 C_{gs} R_5 g_m r_o s^2 + 2C_5 C_{gs} R_5 r_o s^2 + 2C_5 C_{gs} R_5 s^2 - 2C_5 R_5 g_m^2 r_o s - 4C_5 R_5 r_o s - 4C_5 R_5 s$$

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

[illegible]

10.27 INVALID-ORDER-27 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, L_L s + R_L + \frac{1}{C_L s} \right)$

$$H(s) = -3C_5 C_L C_{g_d}^2 L R_5 r_o s^5 + 3C_5 C_L C_{g_d}^2 R_5 R_1 r_o s^4 + 2C_5 C_L C_{g_d} C_{gs} L L R_5 r_o^2 s^5 + C_5 C_L C_{g_d} C_{gs} L R_5 r_o s^5 + 2C_5 C_L C_{g_d} C_{gs} R_5 R_1 r_o^2 s^4 + C_5 C_L C_{g_d} C_{gs} R_5 R_1 r_o s^4 + 2C_5 C_L C_{g_d} L R_5 g_m r_o^2 s^4 + C_5 C_L C_{g_d} L R_5 g_m r_o s^4 + 2C_5 C_L C_{g_d} L R_5 r_o s^4 + 6C_5 C_L C_{g_d} L R_5 s^4 + 2C_5 C_L C_{g_d} R_5 L g_m r_o^2 s^3 + C_5 C_L C_{g_d} R_5 L g_m r_o s^3 + 2C_5 C_L C_{g_d} R_5 R_1 r_o s^3 + 6C_5 C_L C_{g_d} R_5 R_1 s^3 + C_5 C_L C_{g_d} R_5 r_o s^3 + C_5 C_L C_{gs} L R_5 g_m r_o s^4 + 2C_5 C_L C_{gs} L R_5 r_o s^4 + 2C_5 C_L C_{gs} L R_5 s^4 + C_5 C_L C_{gs} R_5 R_1 g_m r_o s^3 + 2C_5 C_L C_{gs} R_5 R_1 r_o s^3 + 2C_5 C_L C_{gs} R_5 R_1 s^3 - 2C_5 C_L L R_5 g_m^2 r_o s^8 -$$

10.28 INVALID-ORDER-28 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \frac{1}{C_L s + \frac{1}{R_L} + \frac{1}{L_L s}} \right)$

$$H(s) = -C_5 C_L C_{gd} L_L R_5 R_L R_{\tau o} s^4 - C_5 C_L L_L R_5 R_{L1g m} r_o s^3 + 3 C_5 C_{gd}^2 L_L R_5 R_L R_{\tau o} s^4 + 2 C_5 C_{gd} C_{gs} L_L R_5 R_L R_{\tau o}^2 s^4 + C_5 C_{gd} C_{gs} L_L R_5 R_L R_{\tau o} s^4 + 2 C_5 C_{gd} L_L R_5 R_L R_{\tau o} s^3 + 2 C_5 C_{gd} L_L R_5 R_L R_{\tau o} s^3 + 6 C_5 C_{gd} L_L R_5 R_L s^3 + C_5 C_{gd} L_L R_5 R_{\tau o} s^3 + C_5 C_{gd} R_5 R_L R_{\tau o} s^2 + C_5 C_{gs} L_L R_5 R_{L1g m} r_o s^3 + 2 C_5 C_{gs} L_L R_5 R_L R_{\tau o} s^3 + 2 C_5 C_{gs} L_L R_5 R_L s^3 - 2 C_5 L_L R_5 R_{L1g m}^2 r_o s^2 - 4 C_5 L_L R_5 R_{L1g m} s^2 - C_5 L_L R_5 R_{L1g m}^2 r_o s^2 - C_5 R_5 R_{L1g m} r_o s^2 - C_5 R_5 R_{L1g m} R_{\tau o} s + C_L C_{gd} C_{gs} L_L R_5 R_L R_{\tau o}^2 s^4 + C_L C_{gd} L_L R_5 R_{L1g m} r_o^2 s^3 + 2 C_L C_{gd} L_L R_5 R_{L1g m} r_o s^3 + C_L C_{gd} C_{gs} L_L R_5 R_L R_{\tau o} s^3 + 2 C_L C_{gd} L_L R_5 R_L s^3$$

10.29 INVALID-ORDER-29 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \frac{L_L s}{C_L L_L s^2 + 1} + R_L \right)$

$$H(s) = -3C_5 C_L C_{gd}^2 L_L R_5 R_L r_o s^5 + 2C_5 C_L C_{gsd} C_{gd} L_L R_5 R_L r_o s^5 + C_5 C_L C_{gsd} C_{gs} L_L R_5 R_L r_o s^5 + 2C_5 C_L C_{gsd} L_L R_5 R_L g_m r_o^2 s^4 + C_5 C_L C_{gd} L_L R_5 R_L g_m r_o s^4 + 2C_5 C_L C_{gsd} L_L R_5 R_L r_o s^4 + 6C_5 C_L C_{gsd} L_L R_5 R_L s^4 + C_5 C_L C_{gsd} L_L R_5 r_o s^4 + C_5 C_L C_{gs} L_L R_5 R_L g_m r_o s^4 + 2C_5 C_L C_{gs} L_L R_5 R_L r_o s^4 + 2C_5 C_L C_{gs} L_L R_5 R_L r_o s^4 + 2C_5 C_L C_{gs} L_L R_5 R_L s^4 - 2C_5 C_L L_L R_5 R_L g_m^2 r_o s^3 - 4C_5 C_L L_L R_5 R_L g_m s^3 - C_5 C_L L_L R_5 g_m r_o s^3 + 3C_5 C_{gd}^2 L_L R_5 r_o s^4 + 3C_5 C_{gd}^2 L_L R_L r_o s^3 + 2C_5 C_{gd} C_{gs} L_L R_5 r_o^2 s^4 + C_5 C_{gd} C_{gs} L_L R_L r_o s^4 + 2C_5 C_{gd} C_{gs} R_5 R_L r_o s^3 + C_5 C_{gd} C_{gs} R_5 R_L r_o^2 s^3 + C_5 C_{gd} C_{gs} R_5 R_L s^3 + 2C_5 C_{gd} L_L R_5 g_m r_o^2 s^3 + C_5 C_{gd} L_L R_5 g_m r_o s^3$$

10.30 INVALID-ORDER-30 $Z(s) = \left(\infty, \infty, \infty, \infty, \frac{R_5}{C_5 R_5 s + 1}, \frac{R_L \left(L_L s + \frac{1}{C_L s} \right)}{L_L s + R_L + \frac{1}{C_L s}} \right)$

$$H(s) = -3C_5 C_L C_{gd}^2 L_1 R_5 R_L r_o s^5 + 2C_5 C_L C_{gd} C_g L_1 R_5 R_L r_o^2 s^5 + C_5 C_L C_{gd} C_g L_1 R_5 R_L r_o s^5 + 2C_5 C_L C_{gd} L_1 R_5 R_L g_m r_o^2 s^4 + C_5 C_L C_{gd} L_1 R_5 R_L g_m r_o s^4 + 2C_5 C_L C_{gd} L_1 R_5 R_L r_o s^4 + 6C_5 C_L C_{gd} L_1 R_5 R_L s^4 + C_5 C_L C_{gd} L_1 R_5 R_L r_o s^4 + C_5 C_L C_{gd} L_1 R_5 R_L r_o s^3 + C_5 C_L C_g L_1 R_5 R_L g_m r_o s^4 + 2C_5 C_L C_g L_1 R_5 R_L r_o s^4 + 2C_5 C_L C_g L_1 R_5 R_L r_o s^4 - 2C_5 C_L L_1 R_5 R_L g_m^2 r_o s^3 - 4C_5 C_L L_1 R_5 R_L g_m s^3 - C_5 C_L L_1 R_5 g_m r_o s^3 - C_5 C_L R_5 R_L g_m r_o s^3 + 3C_5 C_{gd}^2 R_5 R_L r_o s^3 + 2C_5 C_{gd} C_g R_5 R_L r_o^2 s^3 + C_5 C_{gd} C_g R_5 R_L r_o s^3 + 2C_5 C_{gd} R_5 R_L g_m r_o s^2 + C_5 C_{gd} R_5 R_L g_m r_o s^2 + 2C_5 C_{gd} R_5 R_L g_m r_o s^2$$

10.31 INVALID-ORDER-31 $Z(s) = \left(\infty, \infty, \infty, \infty, R_5 + \frac{1}{C_5 s}, R_L \right)$

$$H(s) = \frac{R_L(C_{gd}s - g_m)(C_5 R_5 g_m r_o s + C_5 R_5 s - C_5 r_o s + g_m r_o + 1)}{C_5^2 C_{gd}^2 C_{gs} R_5 R_L r_o^2 s^4 + C_5 C_{gd}^2 C_{gs} R_L g_m r_o^2 s^3 + C_5 C_{gd}^2 R_5 R_L r_o s^3 + 3C_5^2 C_{gd}^2 R_L r_o s^3 - C_5 C_{gd} C_{gs} R_5 R_L g_m r_o^2 s^3 + C_5 C_{gd} C_{gs} R_5 R_L r_o s^3 + C_5 C_{gd} C_{gs} R_5 r_o^2 s^3 + 2C_5 C_{gd} C_{gs} R_L r_o^2 s^3 + C_5 C_{gd} C_{gs} R_L r_o s^3 - C_5 C_{gd} R_5 R_L g_m r_o^2 s^2 - C_5 C_{gd} R_5 R_L g_m r_o s^2 + C_5 C_{gd} R_5 g_m r_o^2 s^2 + 2C_5 C_{gd} R_5 g_m r_o s^2 + C_5 C_{gd} R_5 r_o s^2 + 6C_5 C_{gd} R_L r_o s^2 + C_5 C_{gd} R_L r_o^2 s^2 - C_5 C_{gs} R_5 R_L g_m r_o s^2 + C_5 C_{gs} R_5 g_m r_o s^2 + C_5 C_{gs} R_5 r_o s^2 + C_5 C_{gs} R_L r_o s^2 + 2C_5 C_{gs} R_L r_o^2 s^2 - C_5 R_5 g_o^2 r_o s^2}$$

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

[illegible]

