Filter Summary Report: TIA,simple,Z1

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Contents

1 Examined $H(z)$ for TIA simple Z1: $\infty \operatorname{sign}\left(\frac{Z_1 g_m}{Z_1 g_m+1}\right)$

$$H(z) = \infty \operatorname{sign}\left(\frac{Z_1 g_m}{Z_1 g_m + 1}\right)$$

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 $Z(s) = (R_1,\ \infty,\ \infty,\ \infty,\ \infty,\ \infty)$

$$H(s) = \begin{cases} \text{NaN} & \text{for } \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.2 INVALID-ORDER-2 $Z(s) = (L_1 s,\ \infty,\ \infty,\ \infty,\ \infty,\ \infty)$

$$H(s) = \begin{cases} \text{NaN} & \text{for } \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.3 INVALID-ORDER-3 $Z(s) = \left(\frac{1}{C_1 s},\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for } \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.4 INVALID-ORDER-4 $Z(s) = \left(\frac{R_1}{C_1 R_1 s+1},\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for}\ \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.5 INVALID-ORDER-5 $Z(s) = \left(R_1 + \frac{1}{C_1 s},\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for}\ \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.6 INVALID-ORDER-6 $Z(s) = \left(L_1 s + \frac{1}{C_1 s},\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for}\ \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.7 INVALID-ORDER-7 $Z(s) = \left(\frac{L_1 s}{C_1 L_1 s^2+1},\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for}\ \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.8 INVALID-ORDER-8 $Z(s) = \left(L_1 s + R_1 + \frac{1}{C_1 s},\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for}\ \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.9 INVALID-ORDER-9 $Z(s) = \left(\frac{L_1 R_1 s}{C_1 L_1 R_1 s^2 + L_1 s + R_1},\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for}\ \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.10 INVALID-ORDER-10 $Z(s) = \left(\frac{L_1 s}{C_1 L_1 s^2+1} + R_1,\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for}\ \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$

10.11 INVALID-ORDER-11 $Z(s) = \left(\frac{R_1\left(C_1 L_1 s^2+1\right)}{C_1 L_1 s^2 + C_1 R_1 s + 1},\ \infty,\ \infty,\ \infty,\ \infty,\ \infty\right)$

$$H(s) = \begin{cases} \text{NaN} & \text{for}\ \frac{Z_1 g_m}{Z_1 g_m+1} = 0 \\ \frac{\infty Z_1 g_m}{(Z_1 g_m+1)\left|\frac{Z_1 g_m}{Z_1 g_m+1}\right|} & \text{otherwise} \end{cases}$$