$R_1 := 1\cdot k\Omega \qquad R_2 := 220\cdot k\Omega$

$C_1 := 680\cdot pF \qquad C_2 := 56\cdot pF \qquad C_3 := 120\cdot pF$

$$\omega_0 := \sqrt{\frac{1}{R_1\cdot R_2\cdot C_2\cdot C_3}} \qquad \frac{\omega_0}{2\cdot\pi}\cdot\frac{1}{kHz} = 130.895$$

$$G_0 := \frac{C_1}{C_3} \qquad G_0 = 5.667$$

$$h_{hpf}(s) := \frac{-s^2\cdot\frac{C_1}{C_2}}{s^2 + s\cdot\frac{1}{R_2}\cdot\left(\frac{C_1}{C_2\cdot C_3} + \frac{1}{C_3} + \frac{1}{C_2}\right) + \frac{1}{R_1\cdot R_2\cdot C_2\cdot C_3}}$$

$$Q := \frac{\omega_0}{\left[\frac{1}{R_2}\cdot\left(\frac{C_1}{C_2\cdot C_3} + \frac{1}{C_3} + \frac{1}{C_2}\right)\right]} \qquad Q = 1.42$$

$$G_0\cdot Q = 8.049$$

$A_{ol\_dc} := 100$ in dB $\qquad GBW := 2.4\cdot MHz$

$$A_{ol}(s) := \frac{1}{10^{\frac{-A_{ol\_dc}}{20}} + \frac{s}{2\cdot\pi\cdot GBW}}$$

$$Z_{C1}(s) := \frac{1}{s\cdot C_1} \qquad Z_{C2}(s) := \frac{1}{s\cdot C_2} \qquad Z_{C3}(s) := \frac{1}{s\cdot C_3}$$

$$Z_{p1}(s) := \frac{1}{\frac{1}{Z_{C1}(s)} + \frac{1}{R_1}} \qquad Z_{p2}(s) := \frac{1}{\frac{1}{Z_{p1}(s)} + \frac{1}{Z_{C2}(s)}} \qquad Z_{p3}(s) := \frac{1}{\frac{1}{R_1} + \frac{1}{Z_{C2}(s)}}$$

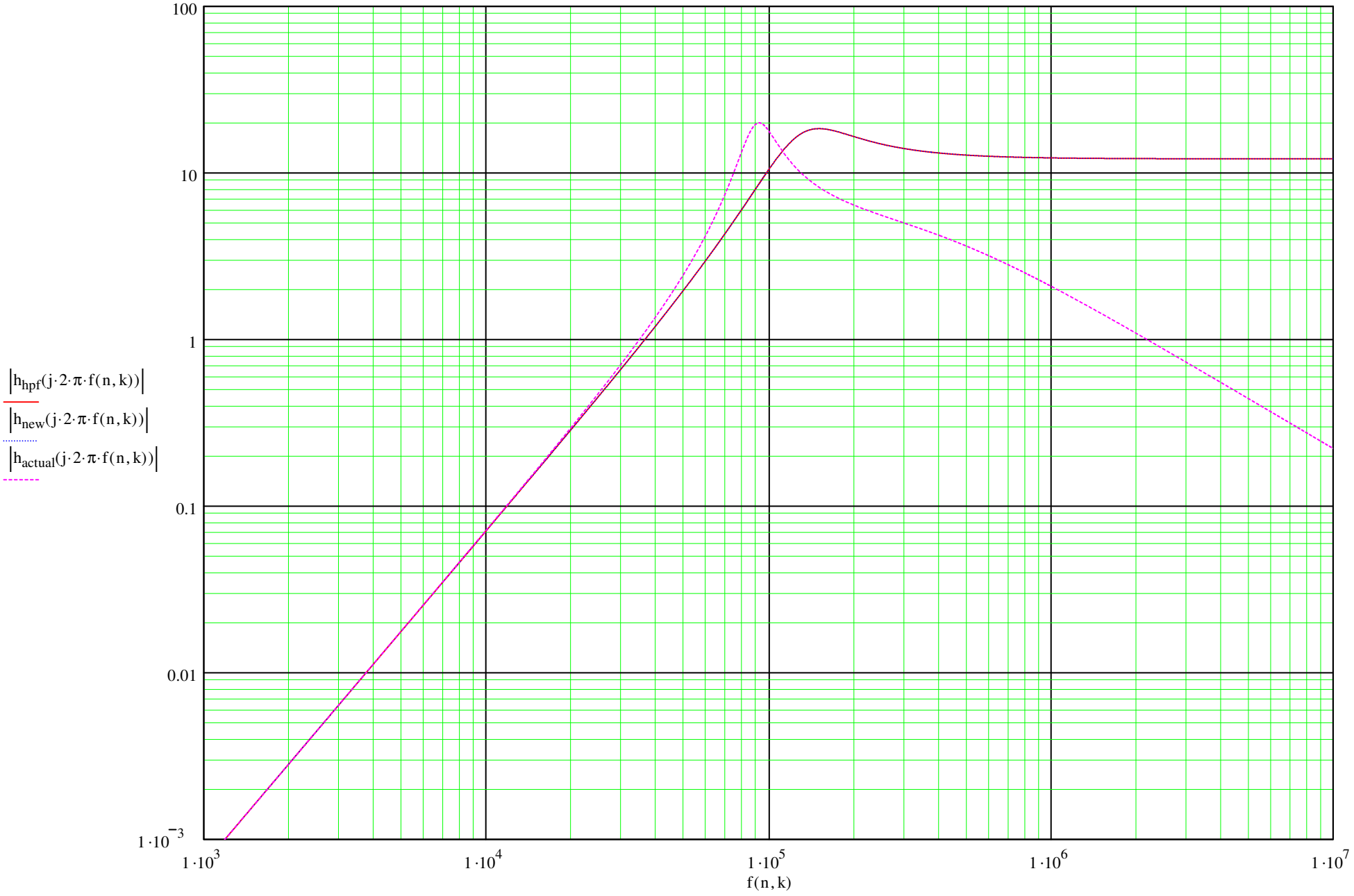
$$\beta(s) := \frac{\frac{Z_{p1}(s)}{Z_{p1}(s) + Z_{C2}(s)}\cdot R_2 + Z_{p2}(s) + Z_{C3}(s)}{R_2 + Z_{p2}(s) + Z_{C3}(s)} \qquad \alpha(s) := \frac{Z_{p3}(s)}{Z_{p3}(s) + Z_{C1}(s)}\cdot\frac{R_2}{R_2 + Z_{p2}(s) + Z_{C3}(s)}$$

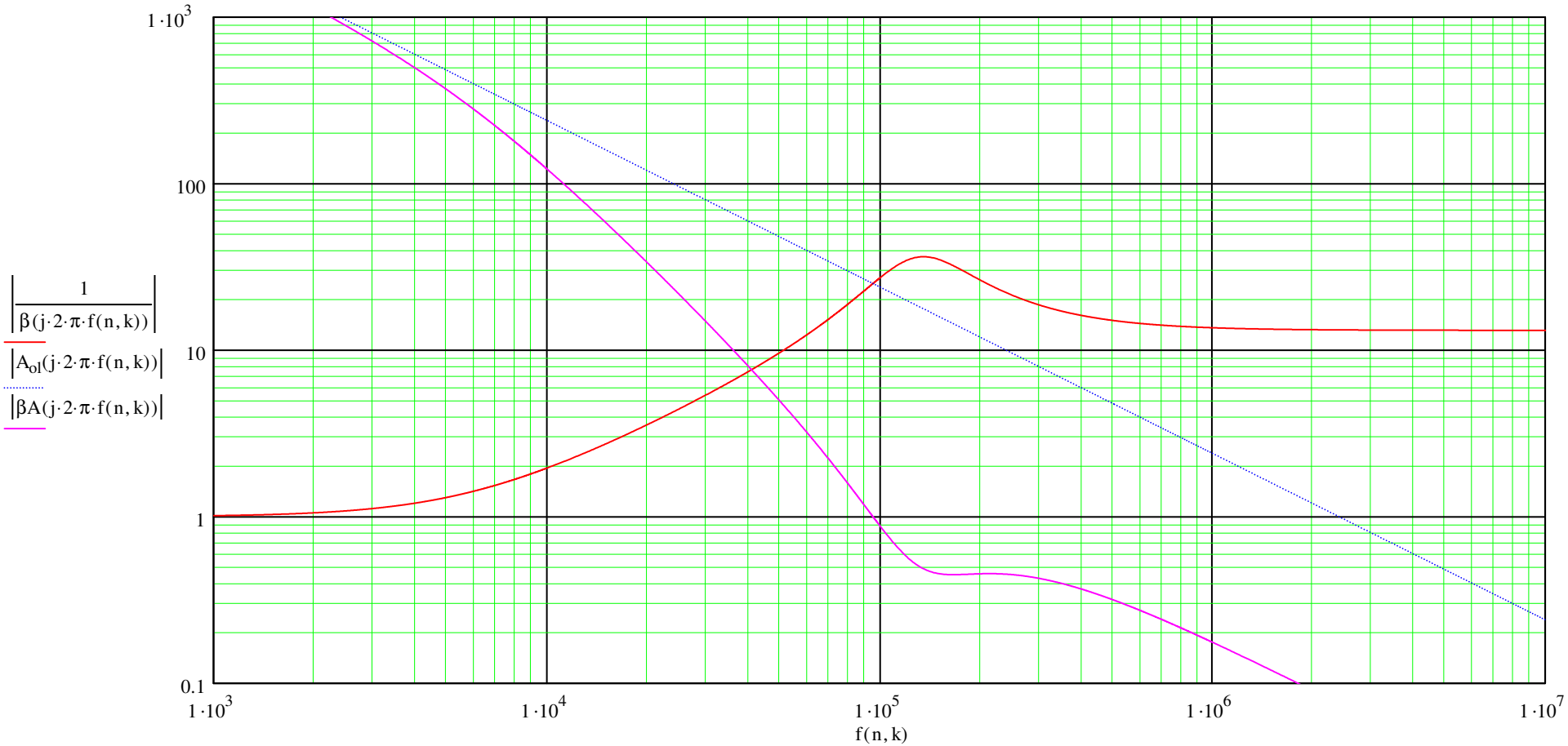
$$h_{new}(s) := \frac{-\alpha(s)}{\beta(s)}$$

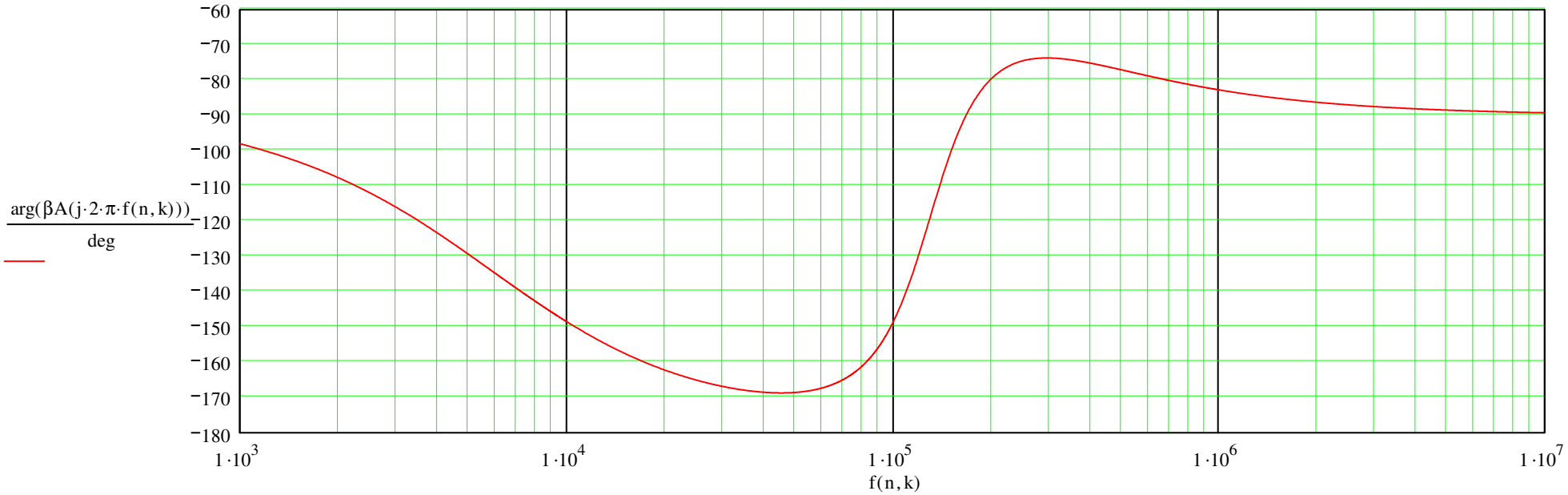
$$munt(s) := \frac{1}{1 + \frac{1}{A_{ol}(s)\cdot\beta(s)}} \qquad \beta A(s) := \beta(s)\cdot A_{ol}(s)$$

$$h_{actual}(s) := h_{new}(s)\cdot munt(s)$$

$$\frac{\arg\left(\beta A(j\cdot 2\cdot 3.14159\cdot 100000)\right)}{deg} = -149.013$$


100
10
1
0.1
0.01
1·10^-3
1·10^3
1·10^4
1·10^5
1·10^6
1·10^7
f(n, k)
|h_hpf(j·2·π·f(n, k))|
|h_new(j·2·π·f(n, k))|
|h_actual(j·2·π·f(n, k))|


$\left|\frac{1}{\beta(j\cdot 2\cdot\pi\cdot f(n,k))}\right|$
$\left|A_{ol}(j\cdot 2\cdot\pi\cdot f(n,k))\right|$
$\left|\beta A(j\cdot 2\cdot\pi\cdot f(n,k))\right|$
$1\cdot 10^3$
100
10
1
0.1
$1\cdot 10^3$
$1\cdot 10^4$
$1\cdot 10^5$
$1\cdot 10^6$
$1\cdot 10^7$
f(n, k)


arg(βA(j·2·π·f(n,k)))
deg
−60
−70
−80
−90
−100
−110
−120
−130
−140
−150
−160
−170
−180
1·10^3
1·10^4
1·10^5
1·10^6
1·10^7
f(n,k)

$\% \equiv \frac{1}{100}$ $m\Omega \equiv 10^{-3}$ $mF \equiv 10^{-3}$ $mH \equiv 10^{-3}$ $mV \equiv 10^{-3}$ $mA \equiv 10^{-3}$ $ms \equiv 10^{-3}$

$kHz \equiv 10^{3}$ $\mu\Omega \equiv 10^{-6}$ $\mu F \equiv 10^{-6}$ $\mu H \equiv 10^{-6}$ $\mu V \equiv 10^{-6}$ $\mu A \equiv 10^{-6}$ $\mu s \equiv 10^{-6}$

$MHz \equiv 10^{6}$ $n\Omega \equiv 10^{-9}$ $nF \equiv 10^{-9}$ $nH \equiv 10^{-9}$ $nV \equiv 10^{-9}$ $nA \equiv 10^{-9}$ $ns \equiv 10^{-9}$

$mm \equiv 10^{-3}$ $mT \equiv 10^{-3}$ $mW \equiv 10^{-3}$ $year \equiv 24 \cdot 365$ $k\Omega \equiv 10^{3}$ $pF \equiv 10^{-12}$ $\mu_0 \equiv 4 \cdot \pi \cdot 10^{-7}$

$n_{min} \equiv 3$ $n_{max} \equiv 7$ $\rho_{Cu} \equiv 0.01754 \cdot 10^{-6}$ $\alpha_{Cu} \equiv 3.93 \cdot 10^{-3}$ $Mrad \equiv 10^{6}$

$n \equiv n_{min}, n_{min} + 1 .. n_{max}$ $k \equiv 0, 0.01 .. 9$ $f(n,k) \equiv 10^{n} \cdot (1 + k)$ n = no. of decades, k = no. of points per decade

$M\Omega \equiv 10^{6}$