Page 43 Equation 36 LM5170-Q1 SNVSAQ6 November 2016

I know this is wrong, I do not know how to fix this.

You say:

$$R_{COMP} = \frac{1}{50 \times R_{CS} \times Gm \times |H(2i \times \pi \times f_{CO})|}$$

$R_{CS} = .001\ \Omega$

RS = .050 Ω

Gm = .001 A/V

K_{FF} = 0.104

Lm = 0.0000047 H

It would help if you used the 0.0000047 H and not 4.7 µH to remind us old guys that we have to go back to base units.

$$H(s) = \frac{1}{K_{FF} \times (R_{CS} + R_S)} \times \frac{1}{s \times \frac{L_m}{R_{CS} + R_S} + 1}$$

$$H(2i \times \pi \times f_{CO}) = \frac{1}{K_{FF} \times (R_{CS} + R_S)} \times \frac{1}{(2i \times \pi \times f_{CO}) \times \frac{L_m}{R_{CS} + R_S} + 1}$$

Plugging back into RCOMP Equation you get:

$$R_{COMP} = \frac{1}{50 \times R_{CS} \times Gm \times \left| \frac{1}{K_{FF} \times (R_{CS} + R_S)} \times \frac{1}{(2i \times \pi \times f_{CO}) \times \frac{L_m}{R_{CS} + R_S} + 1} \right|}$$

Which can be converted to:

$$R_{COMP} = \frac{\left| K_{FF} \times (R_{CS} + R_S) \left[(2i \times \pi \times f_{CO}) \times \frac{L_m}{R_{CS} + R_S} + 1 \right] \right|}{50 \times R_{CS} \times Gm}$$

So the right side of the equation is not what Equation 36 or 77 has.

My other issue is that I am very rusty on my Laplace and Fourier Transforms, last studying them over 35 years ago. But I do not think you can substitute $2i \times \pi \times f_{CO} = s$. I think you may have to convert back to time domain first, i.e. take the inverse transform. Can someone better at the math confirm?