Pre and De emphasis - Multisim - [Pre and De emphasis *]

File Edit View Place MCU Simulate Transfer

Design Toolbox

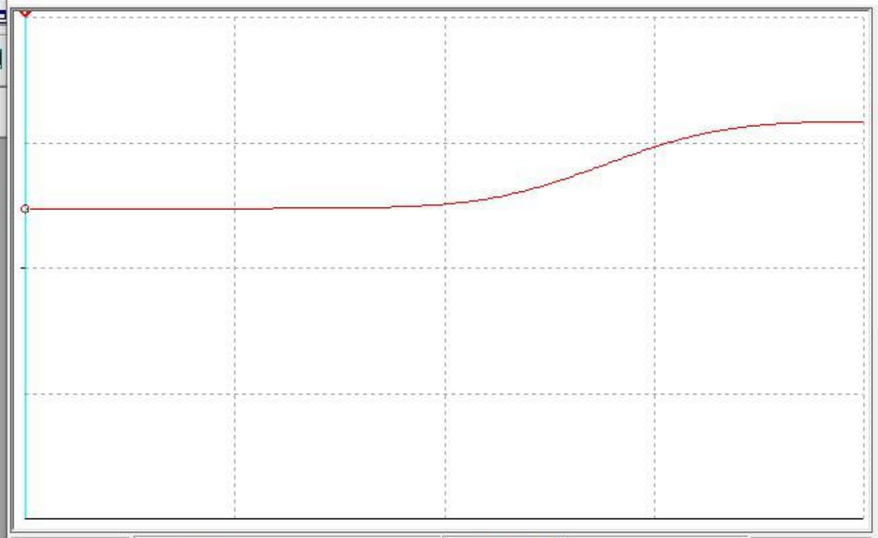
Pre and De emphasis

Pre and De emphasis

Hierarchy Visibility Proj

SPICE Netlist Viewer (ou

Bode Plotter-XBP2



Mode

Magnitude Phase

Horizontal

Log Lin

F 100 kHz

I 10 Hz

Vertical

Log Lin

F 50 dB

I -50 dB

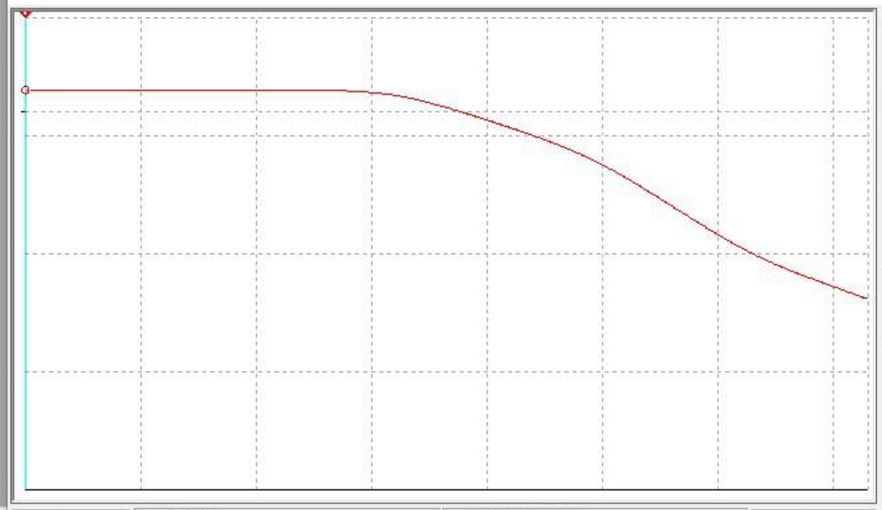
Controls

Reverse Save Set...

10 Hz 11.859 dB

+ In − + Out −

Bode Plotter-XBP1



Mode

Magnitude Phase

Horizontal

Log Lin

F 200 MHz

I 10 Hz

Vertical

Log Lin

F 50 dB

I -200 dB

Controls

Reverse Save Set...

10 Hz 11.859 dB

+ In − + Out −

Pre and De emphasis

Desktop 26% ENG 11:29

DESIGN CALCULATION:

Pre Emphasis, $F_c = \frac{1}{2\pi(\frac{L}{R})}$ $R = 10k\Omega$, $f_c = 2.1kHz$

$$2.1\times10^3 = \frac{10\times10^3}{2\pi\times L}$$

$$L = \frac{10\times10^3}{2\times2.1\times\pi\times10^3}$$

$$\boxed{L = 0.75\,H}$$

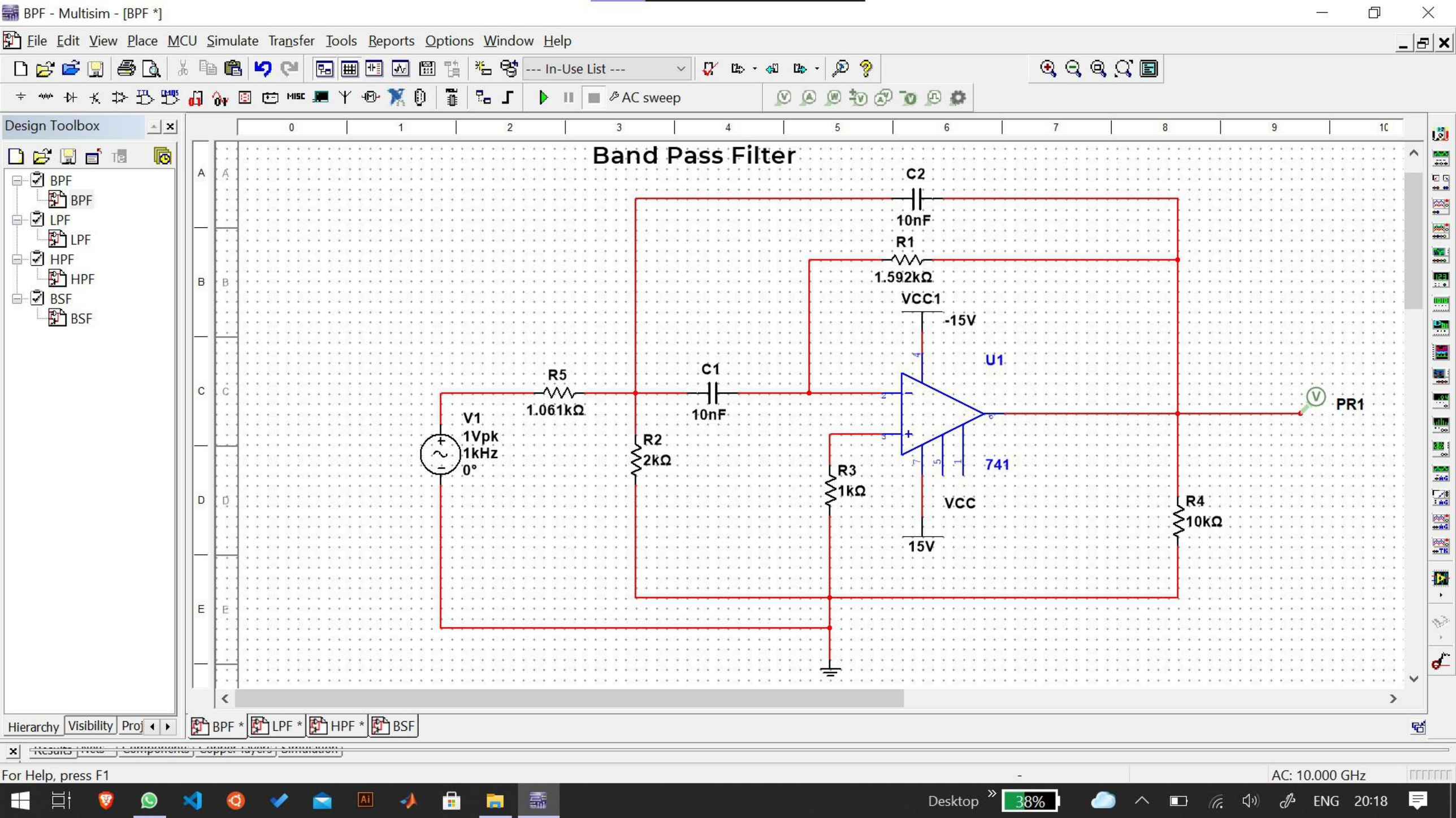
De Emphasis: $R = 75k\Omega$, $f_c = 2.1kHz$

$$F_c = \frac{1}{2\pi RC}$$

$$C = \frac{1}{2\pi R f_c}$$

$$= \frac{1}{2\times\pi\times2.1\times75\times10^6}$$

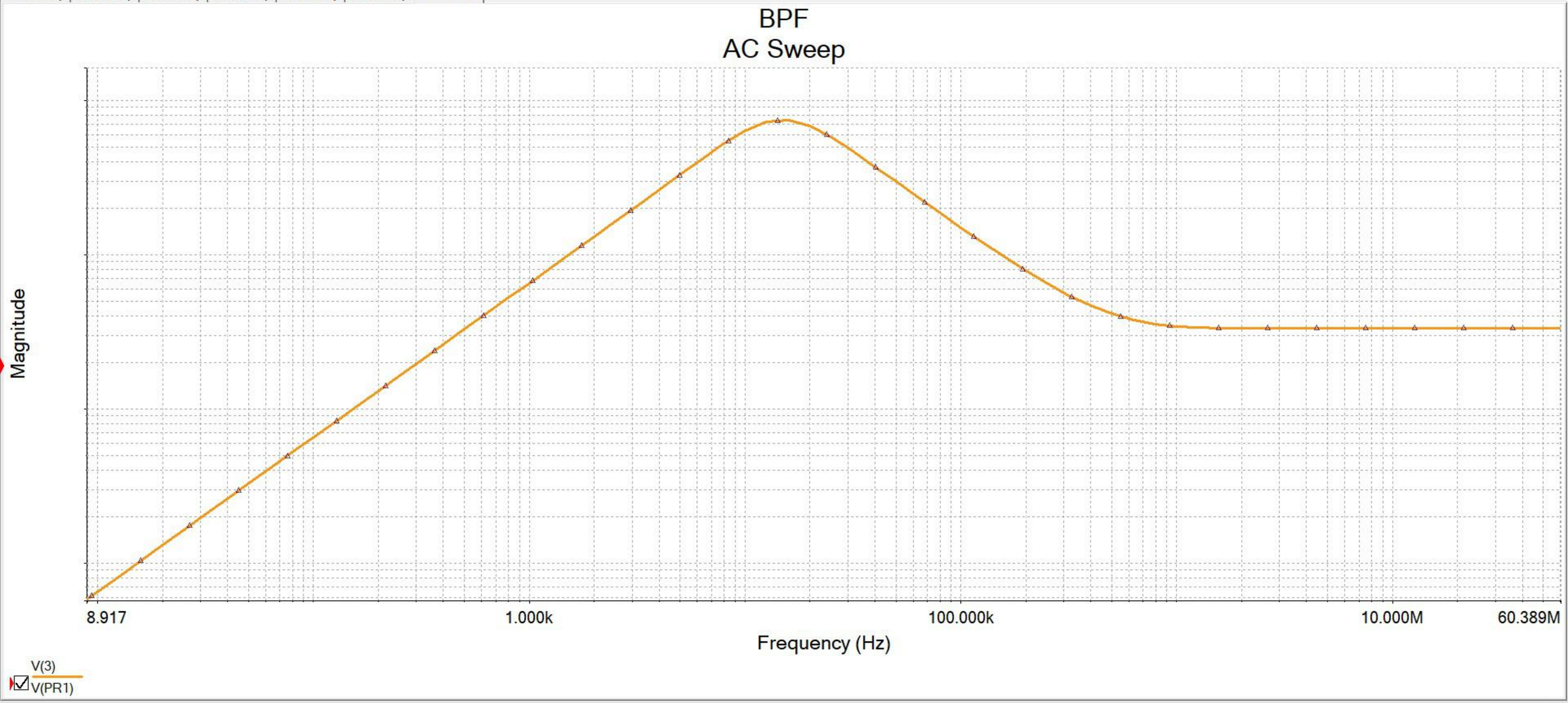
$$\boxed{C = 1nF}$$


BPF - Multisim - [BPF *]
File Edit View Place MCU Simulate Transfer Tools Reports Options Window Help
--- In-Use List ---
AC sweep
Design Toolbox
BPF
BPF
LPF
LPF
HPF
HPF
BSF
BSF
Band Pass Filter
C2
10nF
R1
1.592kΩ
VCC1
-15V
U1
R5
1.061kΩ
C1
10nF
V1
1Vpk
1kHz
0°
R2
2kΩ
R3
1kΩ
741
VCC
15V
R4
10kΩ
PR1
Hierarchy
Visibility
Proj
BPF *
LPF *
HPF *
BSF
For Help, press F1
AC: 10.000 GHz
Desktop
38%
ENG
20:18

Grapher View

File Edit View Graph Trace Cursor Legend Tools Help

AC Sweep | AC Sweep | AC Sweep | AC Sweep | AC Sweep | AC Sweep | AC Sweep

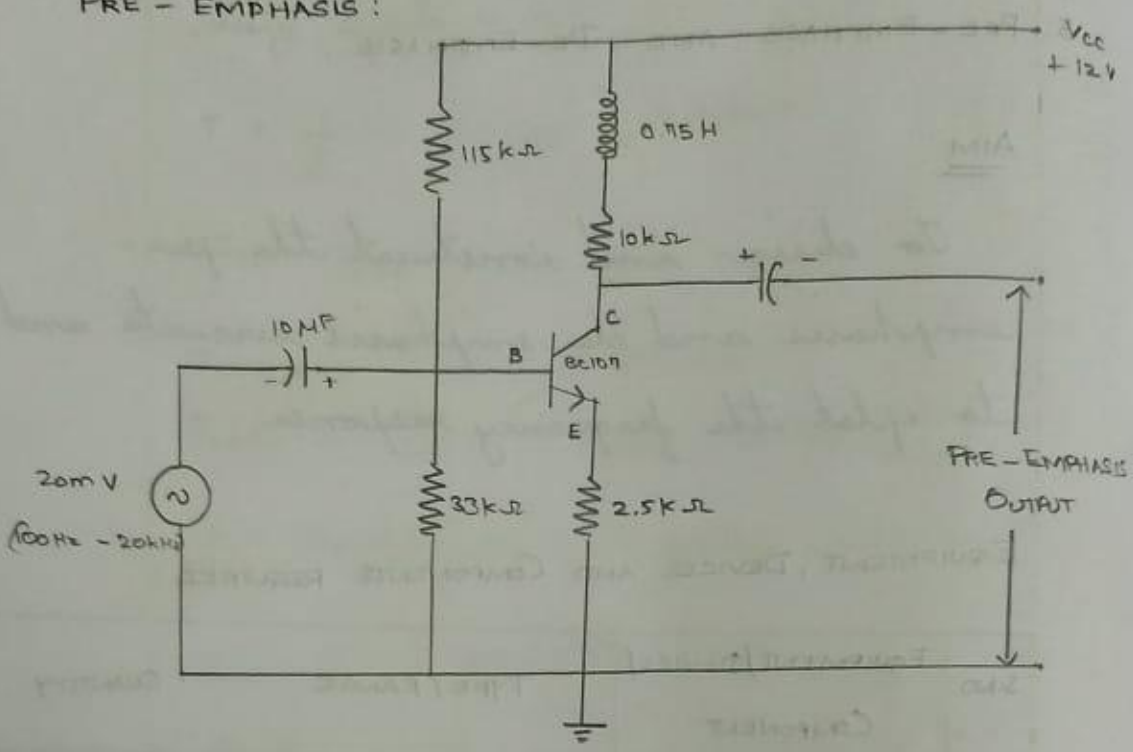


Selected Trace:V(3) | V(PR1)

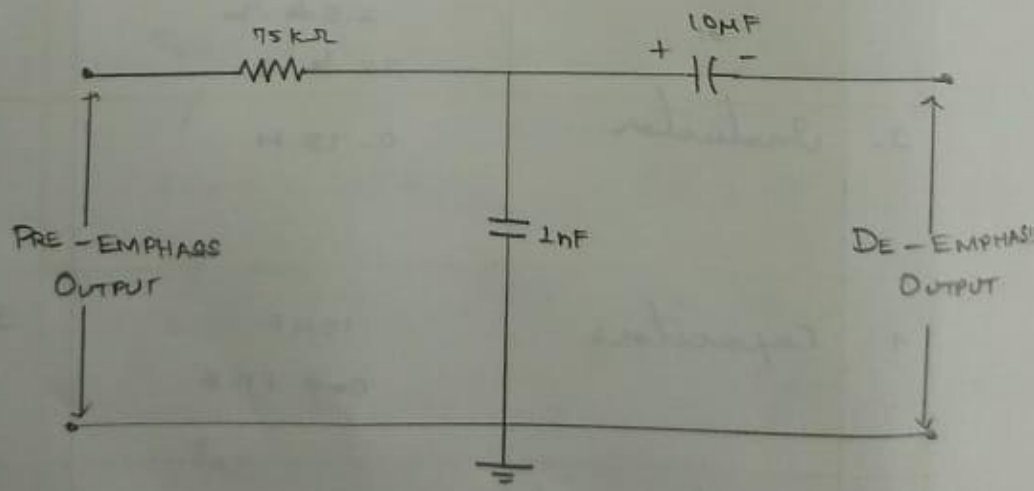
Desktop 36% ENG 20:25

CIRCUIT DIAGRAM:

PRE - EMPHASIS:



DE - EMPHASIS:



Pre and De emphasis - Multisim - [Pre and De emphasis *]

File Edit View Place MCU Simulate Transfer

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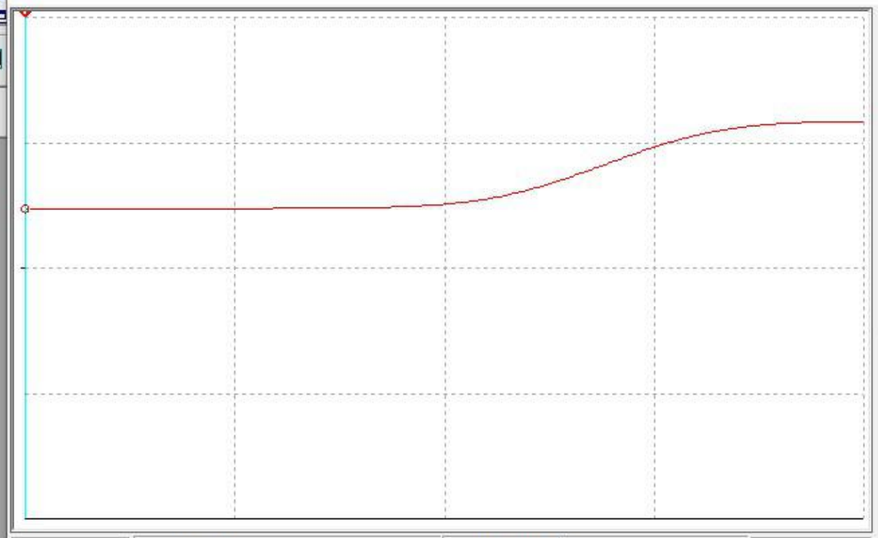

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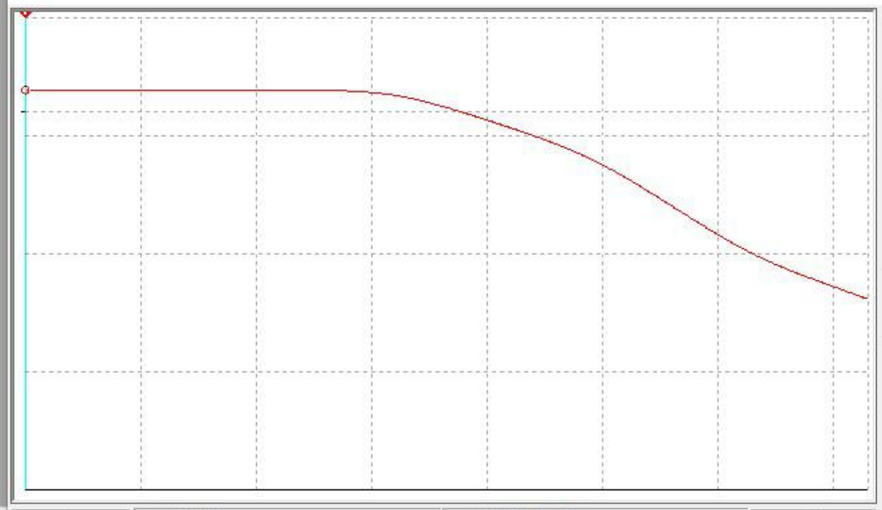
Bode Plotter-XBP1



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+ In − + Out −

Pre and De emphasis

Desktop 26% ENG 11:29

SPECIFICATIONS:

Type Designator : BC107

Material of transistor : Si

Polarity : NPN

Maximum collector power dissipation (P_c), W: 0.3

Maximum collector base voltage $|V_{cb}|$, V: 50

Maximum collector emitter voltage $|V_{ce}|$, V: 45

Maximum emitter base voltage $|V_{eb}|$, V: 6

Maximum collector current $|I_{cmax}|$, A: 0.1

Forward current transfer ratio (h_{FE}), min: 110

DESIGN FORMULA:

CRITICAL FREQUENCY:

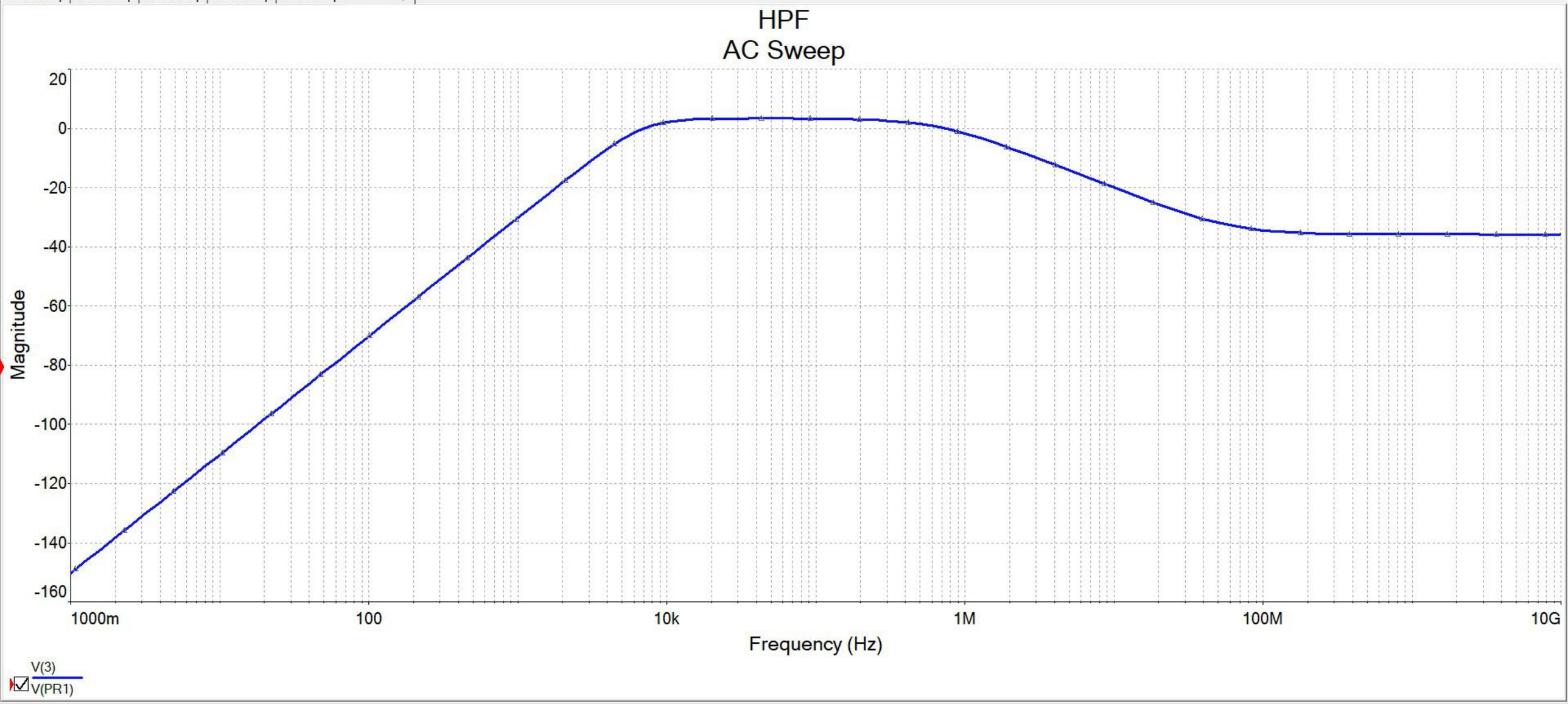
Pre Emphasis : $F_c = \frac{1}{2\pi\left(\frac{L}{R}\right)}$

De Emphasis : $F_c = \frac{1}{2\pi RC}$

Grapher View

File Edit View Graph Trace Cursor Legend Tools Help

AC Sweep | AC Sweep | AC Sweep | AC Sweep | AC Sweep | AC Sweep



Selected Trace:V(3) | V(PR1)