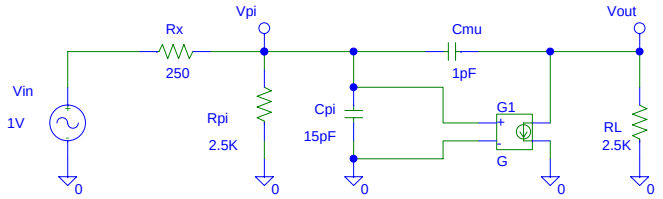
prob 16.53 in Jaeger 3rd edition (compare prob 16.52)

PSpice simulation using a steady-state AC frequency sweep produces a midband gain of +39 dB, $f_L = 0$, and $f_H = 5.52$ MHz. The corresponding hand-worked values, using Miller's theorem in an approximate way, are +39 dB, 0, and 6.04 MHz.

PSpice simulation of the complex input impedance produces the following numbers, also compared with the approximate results from prob. 16.52:

Frequency	prob 16.52 Input Z mag (approx)	prob 16.52 Input Z phase (approx)	prob 16.53 Input Z mag (PSpice)	prob 16.53 Input Z phase (PSice)
0 Hz	2750 Ω	0 deg		
1 kHz	2750 Ω	0 deg		
50 kHz	2,739 Ω	-5 deg	2738 Ω	-5 deg
1 MHz	1341 Ω	-52 deg	1337 Ω	-51 deg
10 MHz	292 Ω	–28 deg	307 Ω	–26 deg
100 MHz	251 Ω	-3 deg	269 Ω	-4 deg

There is excellent agreement up to, and beyond, the frequency of the dominant pole at 5.5 MHz. The approximate use of Miller's theorem explains the discrepancy a 100 MHz.



Jaeger 3rd edition, Prob 16.53 (see prob 16.52)

Vin is an AC source, 1V. Analysis is AC sweep; 0-100MHz. Results are AC steady-state input impedance, and voltage transfer function.

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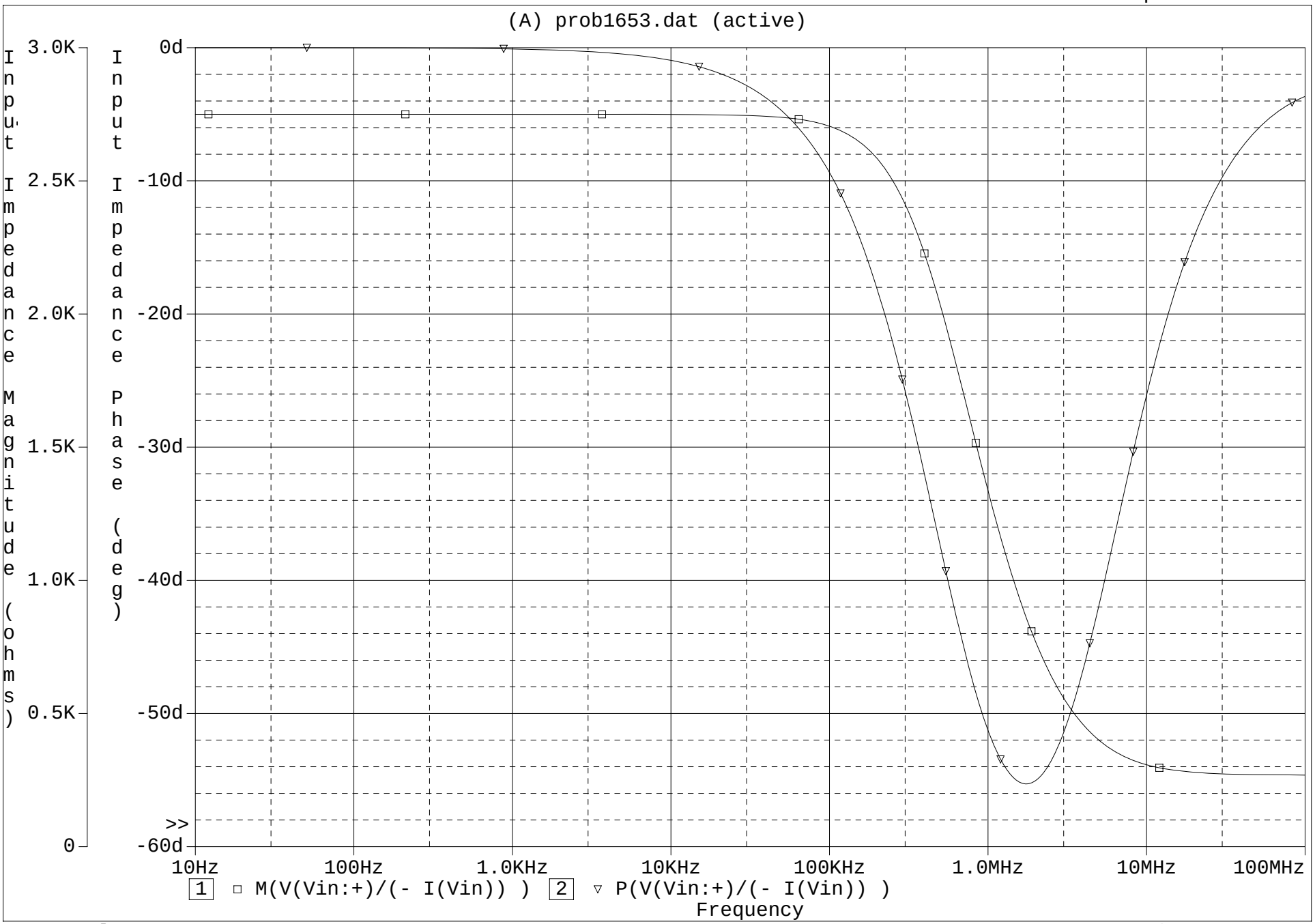
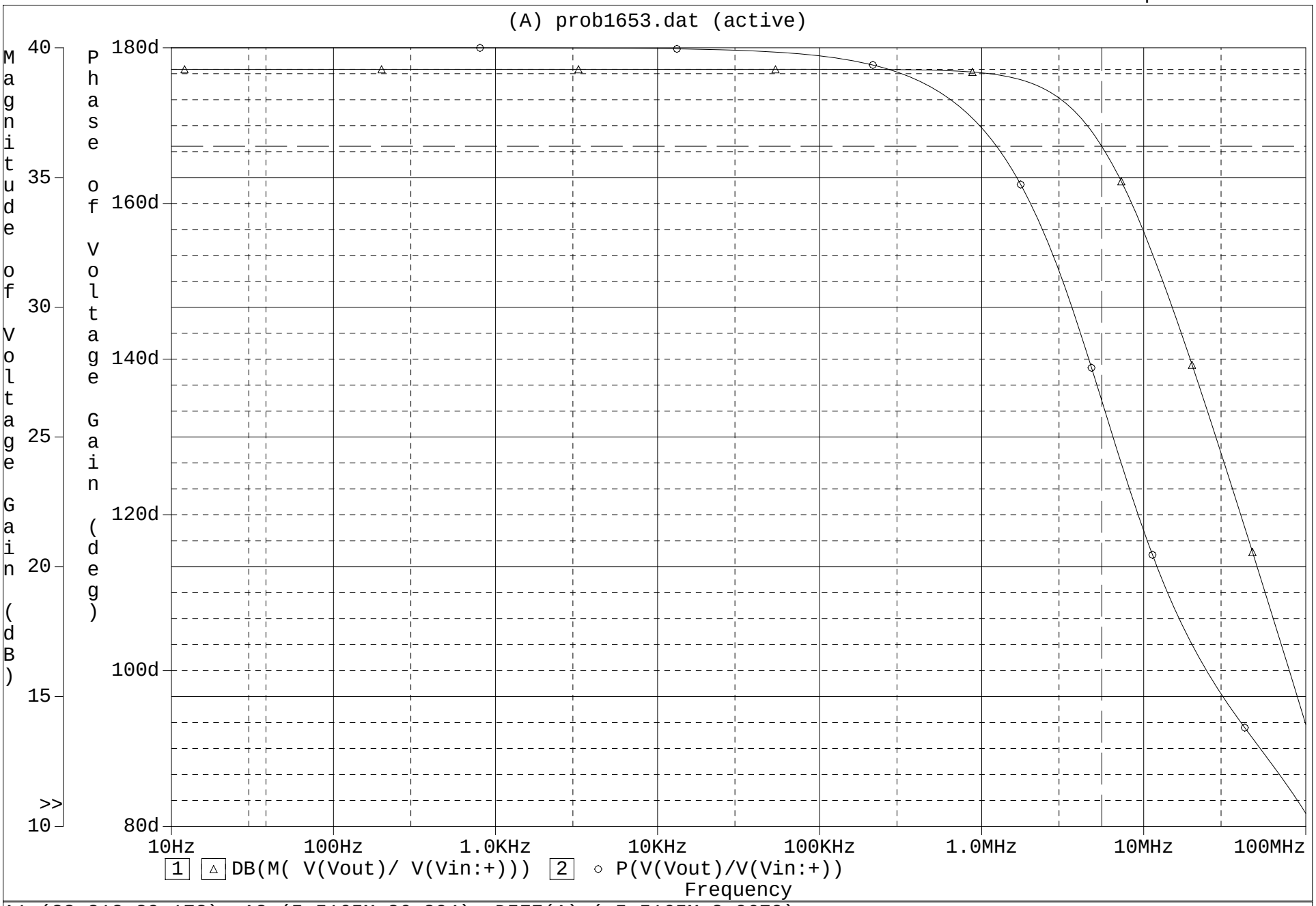

(A) prob1653.dat (active)
Input Impedance Magnitude (ohms)
Input Impedance Phase (deg)
3.0K
2.5K
2.0K
1.5K
1.0K
0.5K
0
0d
-10d
-20d
-30d
-40d
-50d
>>
-60d
10Hz
100Hz
1.0KHz
10KHz
100KHz
1.0MHz
10MHz
100MHz
1 M(V(Vin:+)/(- I(Vin)))
2 P(V(Vin:+)/(- I(Vin)))
Frequency

* C:\Program Files\OrCAD_Demo\PSpice\UserProjects\prob1653.sch

Date/Time run: 07/07/08 16:00:27 Temperature: 27.0



A1:(38.312,39.172) A2:(5.5165M,36.204) DIFF(A):(-5.5165M,2.9679)