

OPA349 spice model acting weird

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Everyone,

I am trying to simulate a circuit (using LTSpice) with a OPA349 from Burr-Brown: 1 microamp Iq, 70kHz GBW, CMOS rail-rail I/O, 1.8V-5.5 opamp. According to the datasheet (<http://focus.ti.com/lit/ds/symlink/opa349.pdf>) this one can drive 8mA without problems.

The OPA349 appears to misbehave in my circuit simulations, so I created a simple test circuit consisting of a simple unity gain inverter with 1 Meg input, feedback and load resistors.

With a 1 MEG load the opamp seems to go out of closed-loop at $V_{in} < 0.8V$ with a 2.2V single supply, whereas the output is supposed to swing to 350mV from the rails with a 10K load, and the input CM range extends 200mV past either rail. If I load the opamp with 10 MEG or more it seems to work. At 100K load or less the simulations become total crap. Changing the feedback resistors to higher or lower values does not improve things either.

Is this a bug in the model? Or am I missing something? I don't have a physical chip to test it on right now, but since the opamp can drive 8mA (and is specced for a rail-to-rail output at 10K load) I really don't think this is how the real hardware should behave!

Substituting a different opamp model (e.g. OPA336) works as expected. Any suggestions? Below spice netlist, opamp model, LTSpice schematic and LTSpice symbol for OPA349...

Spice netlist:

```
* d:\tom\spice\opa349test.asc
XU1 V+ V- VDD 0 VO opa349 opa349
R1 V- Vi 1MEG
R2 VO V- 1MEG
RL VO 0 1MEG
V1 V+ 0 1.2V
V2 Vi 0 PULSE(0 2.2 0 500ms 500ms 0ms 1s)
V3 VDD 0 2.2V
..tran 1s
```

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```
..include opa349.mod
..backanno
..end
```

OPA349 model (from

<http://focus.ti.com/docs/prod/folders/print/opa349.html>)

```
*
* OPA349 operational amplifier "macromodel" subcircuit
* REV A created using Parts release 8.0 on 11/23/99 at 17:01 by Vadim
Ivanov
* REV B Revised 25 August 2000 by Vadim Ivanov
* Parts is a MicroSim product.
*
* connections: non-inverting input
* | inverting input
* || positive power supply
* ||| negative power supply
* |||| output
* |||||
..subckt OPA349 + - V+ V- OUT
*
*
```

```
* INPUT STAGE
```

```
*
```

```
iin V+ 5 200n
```

```
m7 550 vswitch 5 5 pix l=.6u w=20u m=2
```

```
m8 550 550 V- V- nix l=4u w=4u m=1
```

```
m9 553a 550 V- V- nix l=4u w=4u m=1
```

```
m9c 66 nvsat 553a V- nix l=.6u w=4u m=1
```