

What makes transconductance negative?

 electronics.stackexchange.com/questions/575757/what-makes-transconductance-negative

Quote...

"transconductance is -1 amps/volt"

[Refer to this link for the source of my question...](#)

[This reference](#) lacks the negation of A/V while [this reference](#) includes it? I'm confused...to say the least.

[transconductance](#) [conductance](#) [siemens](#)
edited 48 mins ago

asked 16 hours ago



[Chet](#)

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Quoting from the same answer, next sentence: "It's minus only to avoid messy looking wire crossings in the image."

answered 16 hours ago



[Elliot Alderson](#)

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More properly, the transconductance *gain* is -1 A/V.

A transconductance amplifier has a high-impedance input, and it responds to a voltage on that input, while using minimal* current. It has a high-impedance output, and it forces a current on that output without significantly* changing its output current.

The gain of -1 A/V means that -- assuming it's within the range of the amplifier -- changing the input by +1V changes the output by -1A. Changing the input by -0.1V changes the output by +0.1A. Basically, the input/output relationship is $\Delta i_{out} = (-1VA)\Delta v_{in}$. With luck, there's no significant** offset, and for all intents and purposes, $i_{out} = (-1VA)v_{in}$.

* It's usually poor engineering practice to use words like "minimal" and "significantly", without specifying what you mean. In this case those qualities really are in the eyes of the designer -- a transconductance amplifier that would win prizes in 1948 might be pretty mediocre today, and a transconductance amplifier operating no higher than 60Hz should be orders of magnitude better in these regards than one operating at 60kHz.

** There's that word again

answered 16 hours ago



[TimWescott](#)

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Transconductance is not, in general, negative. The transconductance *of the specific amplifier in the question you link* is negative, but in general transconductance can be either positive or negative. Or zero, for that matter.

answered 32 mins ago



[Hearth](#)

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