

# Re: Transistors

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*Source:* <http://sci.tech-archive.net/Archive/sci.electronics.design/2007-11/msg02653.html>

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- *From:* Winfield <[winfieldhill@xxxxxxxxxx](mailto:winfieldhill@xxxxxxxxxx)>
  - *Date:* Sat, 17 Nov 2007 18:18:32 -0800 (PST)
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Jim Thompson wrote:

John Larkin wrote:

Jan Panteltje wrote:

John Larkin wrote...

Yup. THS3062, practically a unique opamp, blinding fast with  $\pm 15$  supplies. But if it's amplifying a sine wave at, say, 20 volts p-p out, and the frequency goes up to roughly 12 MHz, it crashes, pulls tons of power, gets red hot, and phase inverts! If you drop the input signal way down, it recovers!

Well, John!!!! the datasheet specifies input common mode range as  $\pm 13.9V$  MAX. Page 3 of ths3062.pdf. It is a video amp :-)

We're running these at gains in the 3 to 5 range, and it does this working inverting or non-inverting, loaded and unloaded, so it's not a common-mode issue. And at 12 MHz, we're not even slewing a volt per nanosecond yet.

It crashes and phase inverts in either config! It made a nasty blister on me poor finger, it did! But the effect doesn't seem to be thermal, in that freezing it hard doesn't affect the frequency trip threshold much.

## Re: Transistors

I note the 2nd Harmonic Distortion rises rapidly around 10–20MHz. Probably an inadequately stabilized multi-loop that is amplitude dependent.

I think it's likely another matter, one I've struggled with in high-frequency high-voltage-amplitude push-pull amplifiers, namely getting the pullup devices completely off before the pulldown devices turn on. And visa-versa.

Actually, it's generally not possible, or even desirable, to completely achieve this goal, but one struggles hard to avoid having too much rail-rail current under these extreme conditions, because various local parts become overheated. I fear too that many high-frequency high-slew-rate amplifier designs don't pay enough attention to this issue and may experience failures as a result.

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