

Negative spikes appear on the output pin when the comparator switches states if the output pin has a weak pullup. When using a hysteresis resistor the negative spike alters the trip point due to the hysteresis resistor going negative. The negative spike disappears with higher pullup current.

- 1) Is this normal?
- 2) Is this due to the internal compensation capacitor of the LM2901B?
- 3) Any remedy other than higher current pullups?

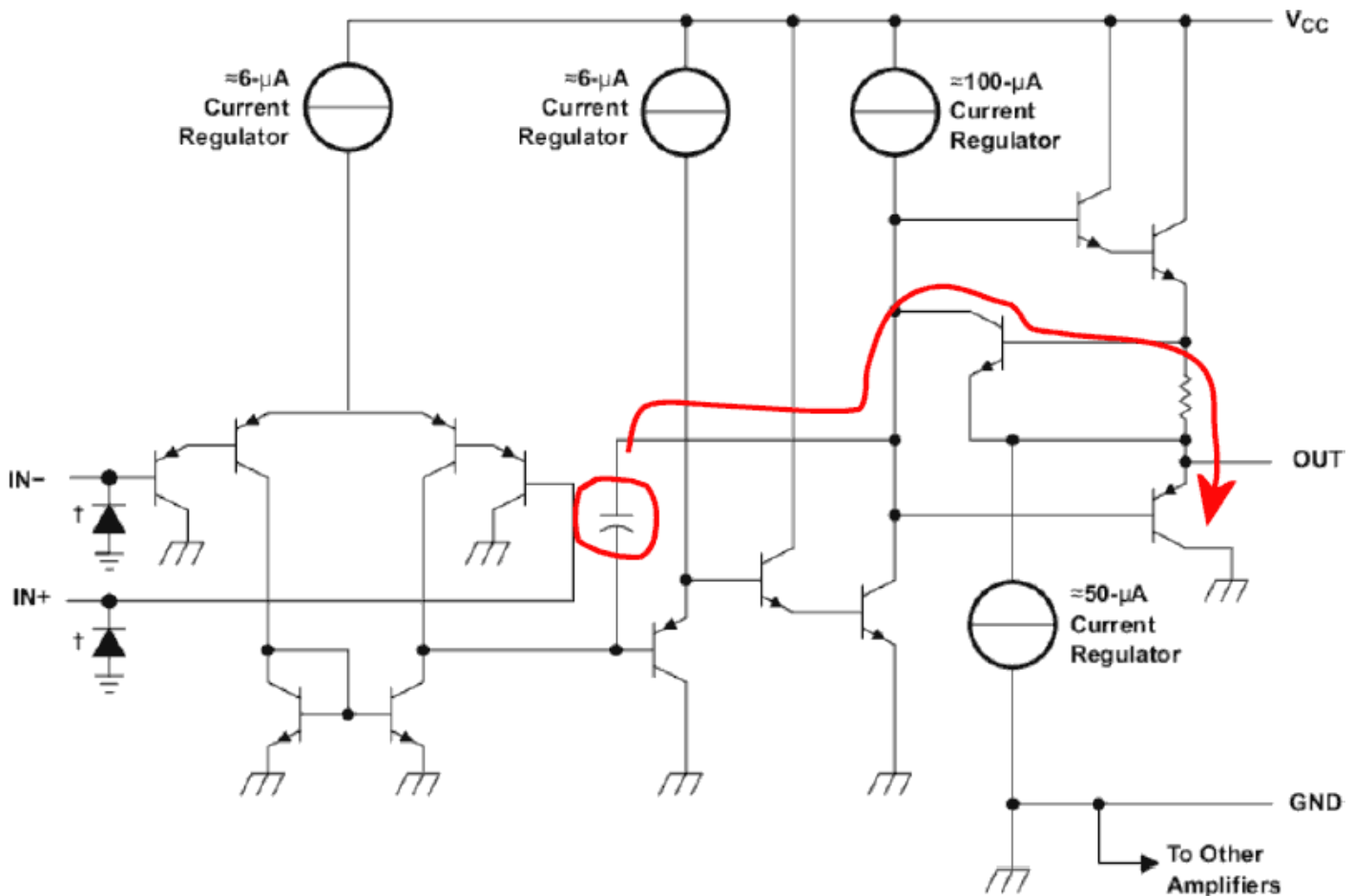
The affected design is low frequency analog. No switching, no PWM, no RF, no digital. I've seen it on multiple schematics and layouts.

Over the next few pages is one circuit example showing scope traces, schematic, and layout.

A. Suspected culprit inside the LM2901B?

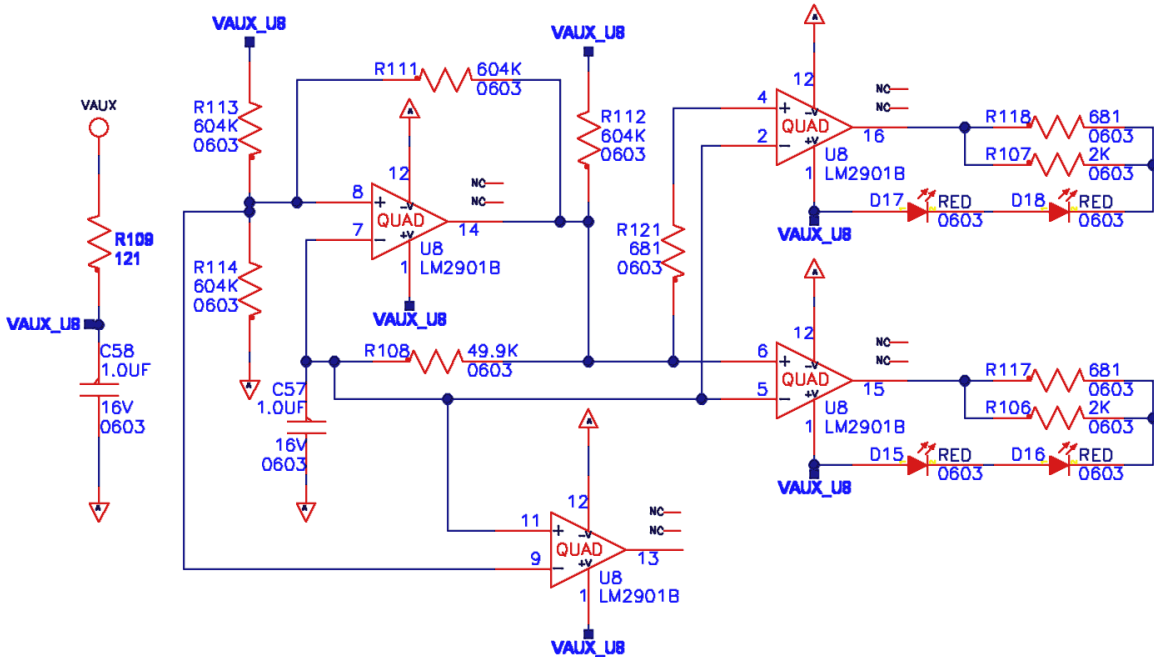
Is it possible when the diff pair switches the comp cap drives the output negative through the collector base junction of the current limit NPN when the output pullup is weak.

7.2 Functional Block Diagram



B. Schematic:

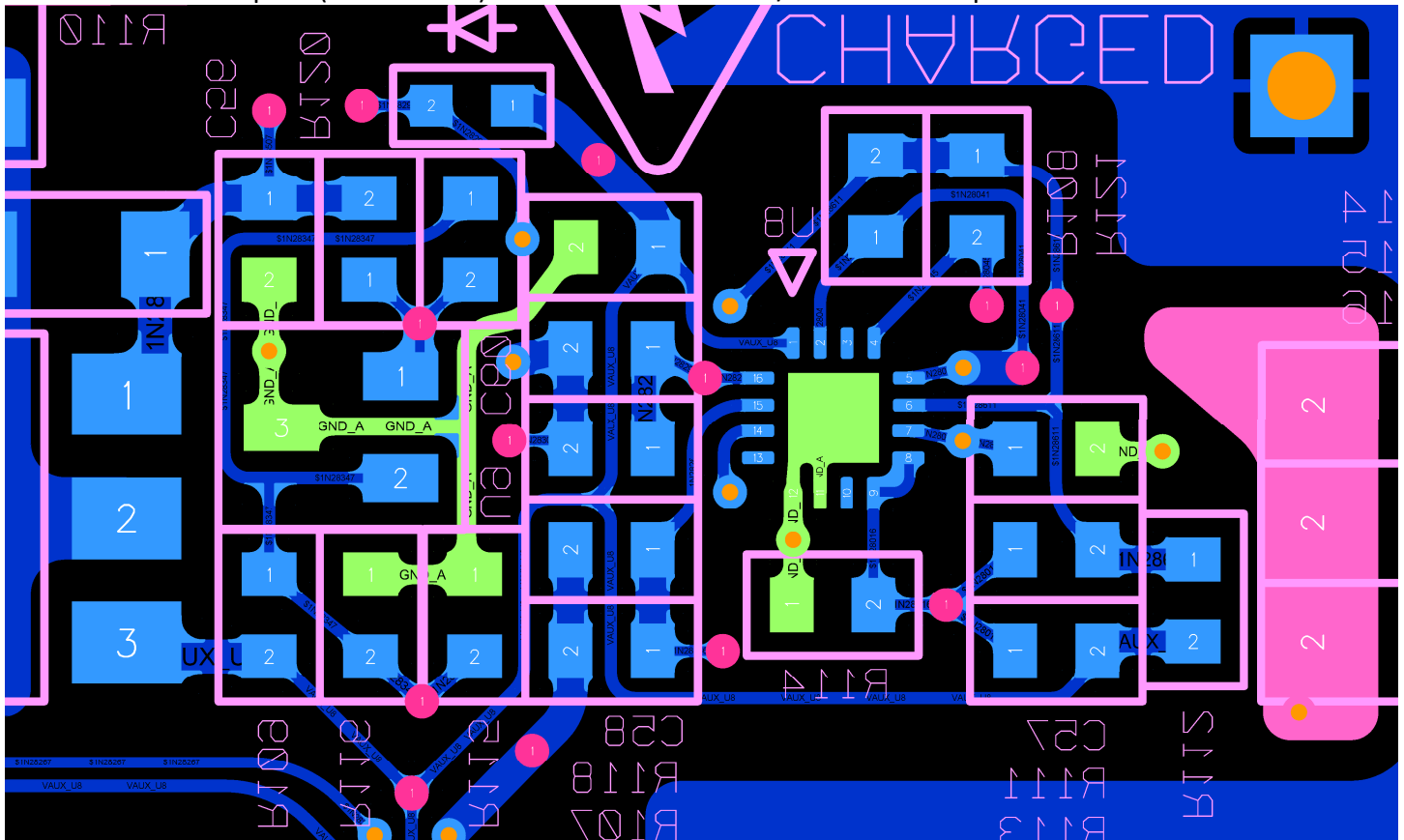
- Pins 13 and 14 have negative spikes (weak or no pullup)
- Pins 15 and 16 do not have negative spikes (heavy pullup)



C. Layout:

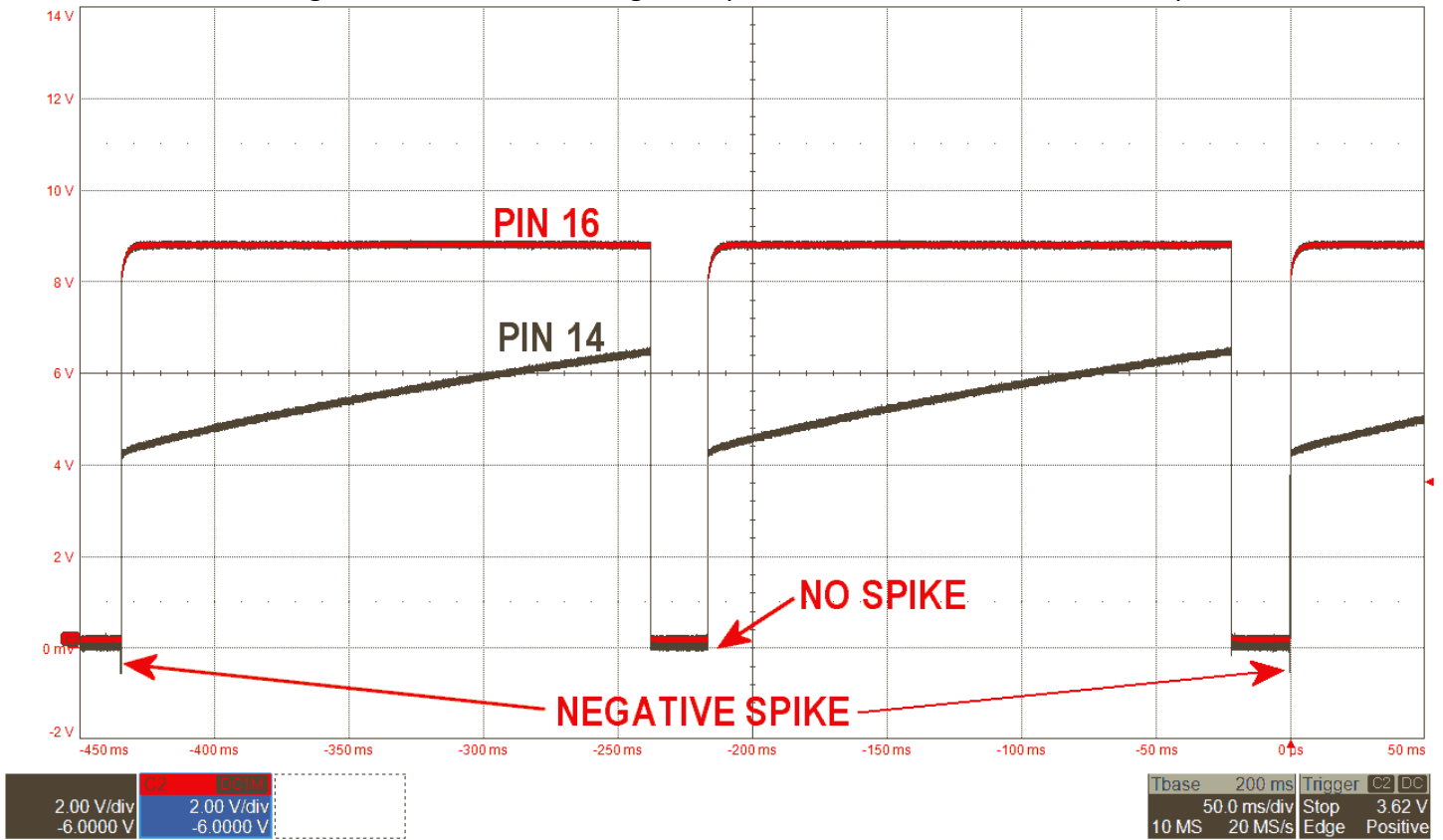
- Layer 1: Three short jumper traces (not shown). Pin 14 to R108, Pin 5 to Pin 7, and R118 to D17
- Layer 2: solid GND plane
- Layer 3: solid GND plane
- Layer 4: LM2901B and all components

Pink circles are test pads (no drill hole). Yellow circles are vias/drill holes. All passive are 0603 size.

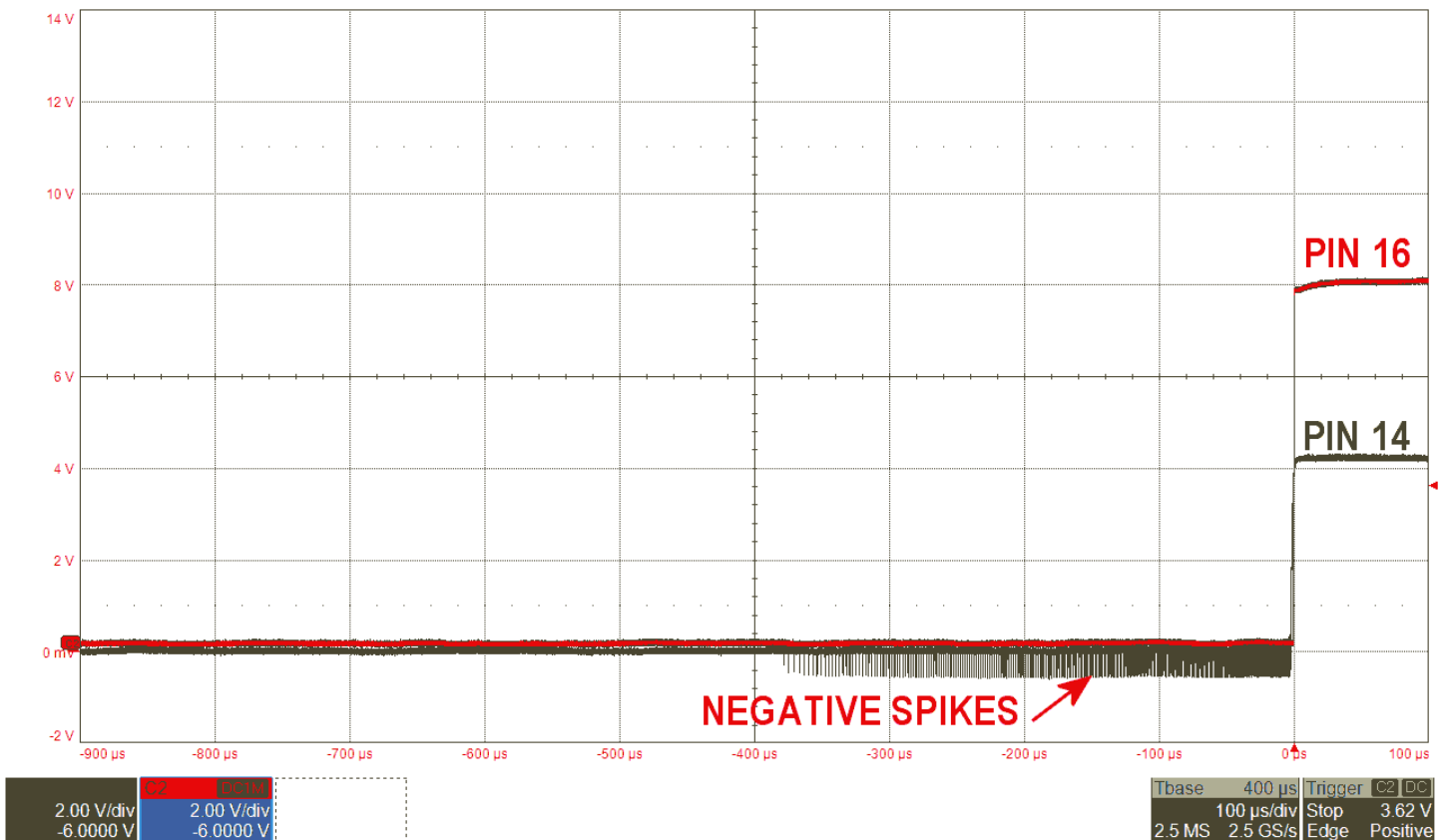


D. Scope traces (2 pages). All scope traces are Full Bandwidth, No filtering, and No averaging.

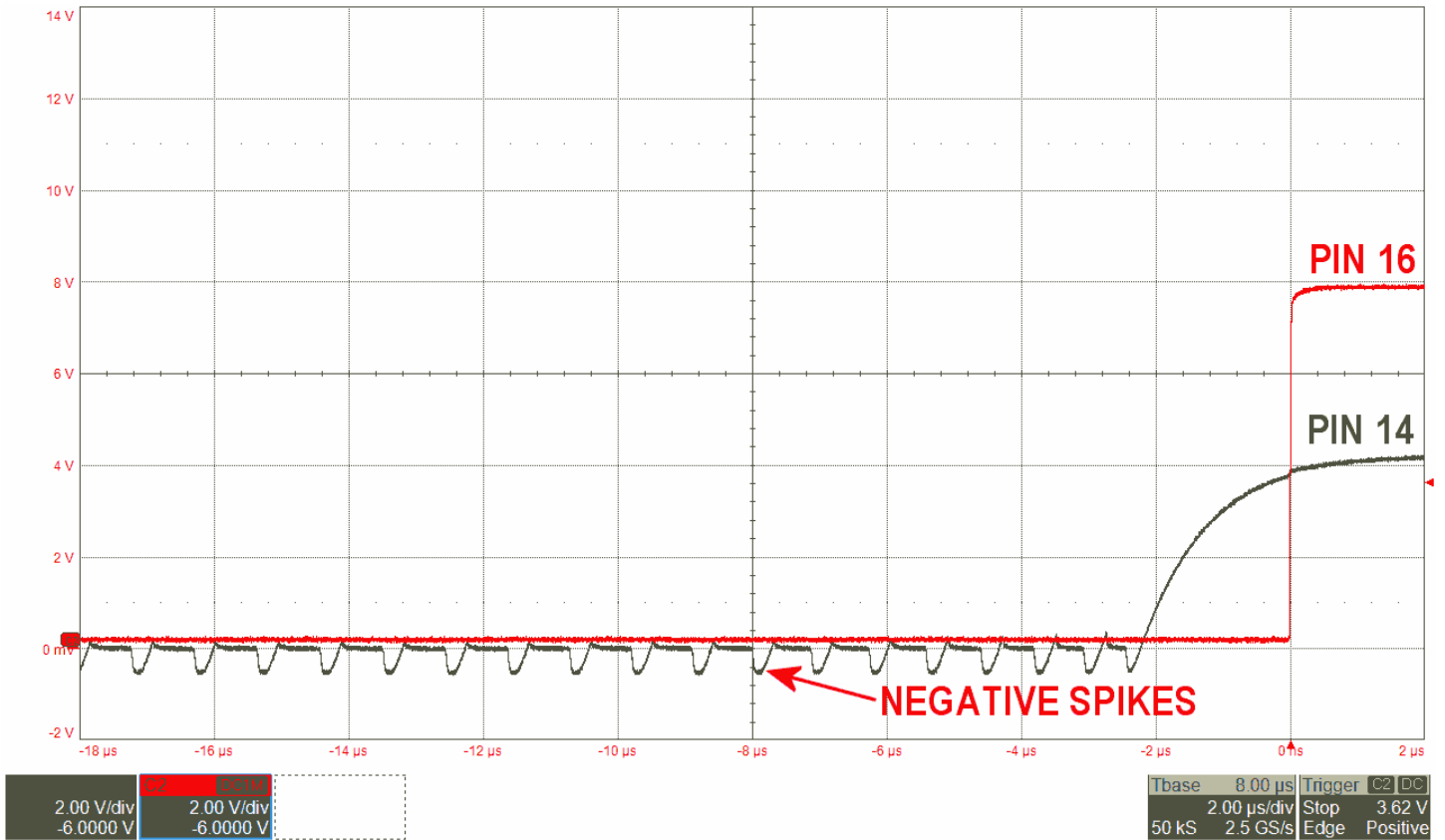
D1: Wide zoom showing two transitions with negative spike and one transition without a spike.



D2: Medium zoom showing negative spike starts and increases frequency before trip.



D3: Close zoom



D4: Zoom when no spikes occur

