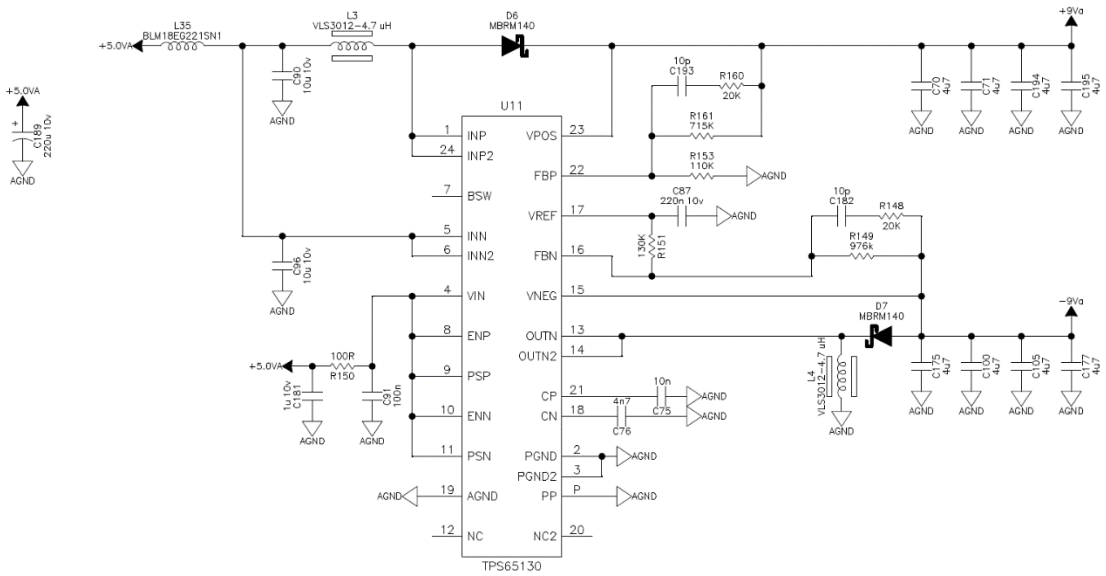
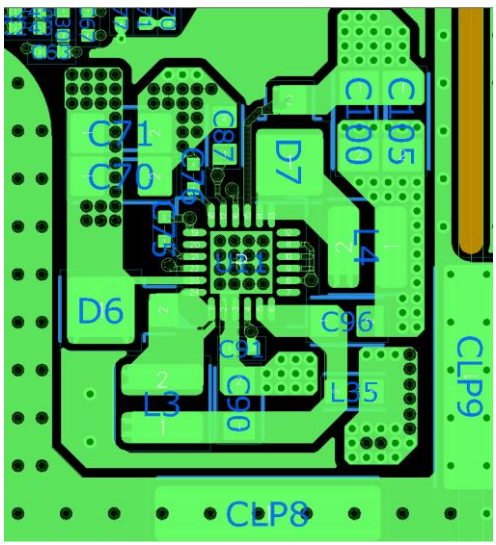
TPS65130 Vpos ripple issue in Power-save mode:

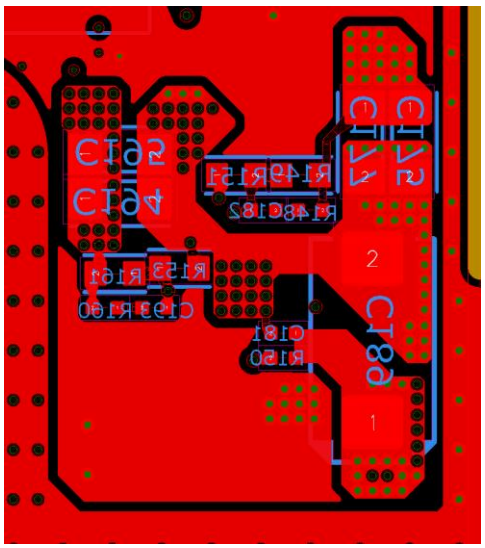
The problem has been detected with the last production lot, and it was never seen before. These units have been bought at Mouser:

The schematic is the one shown below:



And the gerber Top and Bottom layer:

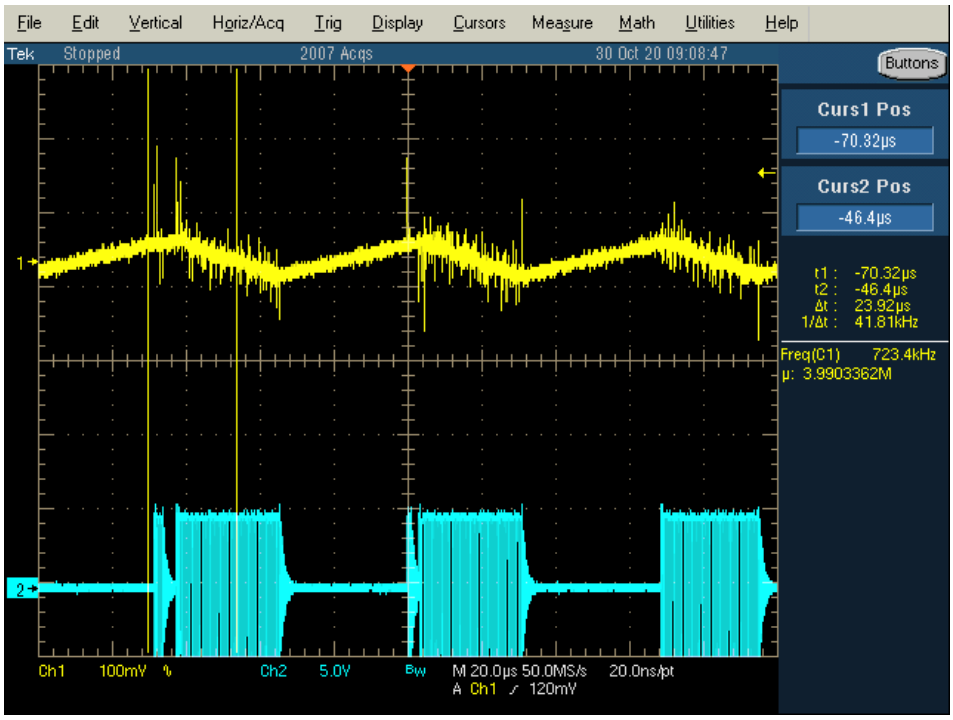




GND is always in an inner layer.

The power consumption is nearly the same for the positive and the negative rail, and is about 20 mA.

In all circumstances, the waveform in the negative rail is something similar as expected:



… with a AC level of about 50mV, very similar to the one in the figure 47 of the datasheet:

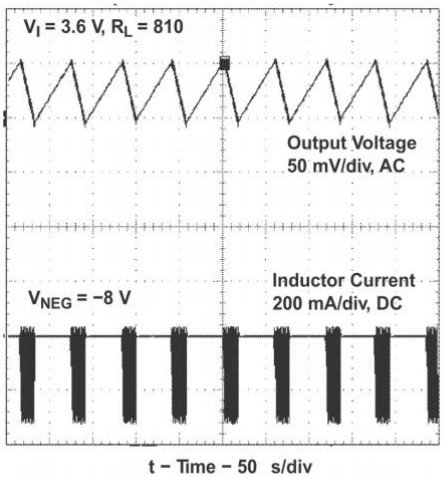
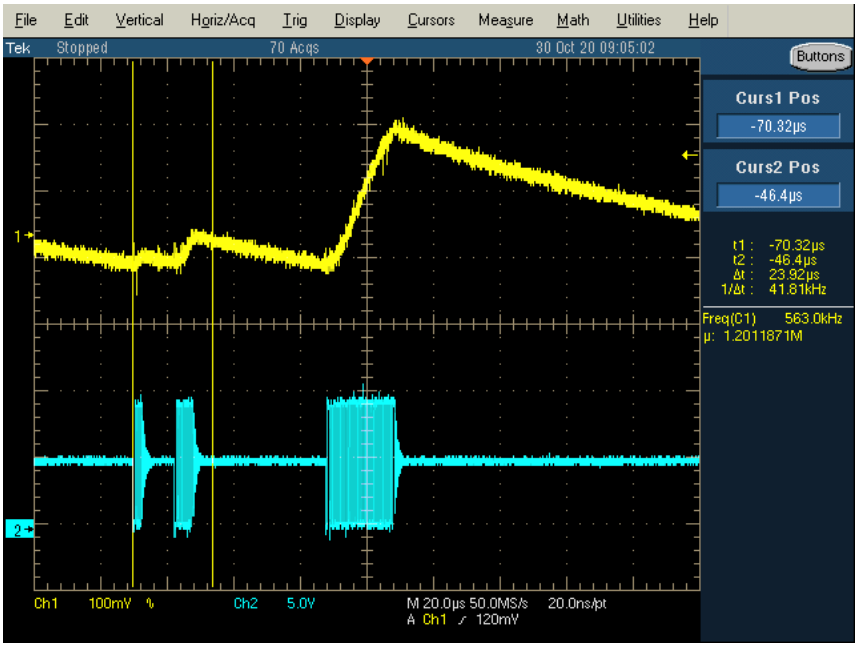


Figure 47. V_{NEG} in Power-Save Mode

But in nearly the whole of the units for this batch of production, the waveform for the positive rail is not as expected, producing a very high amount of noise:



… with an AC level of about 200mV, far away from the expected in the figure 46 of the datasheet:

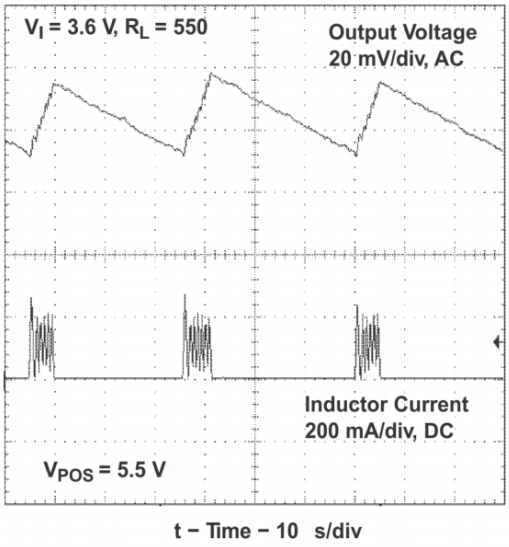
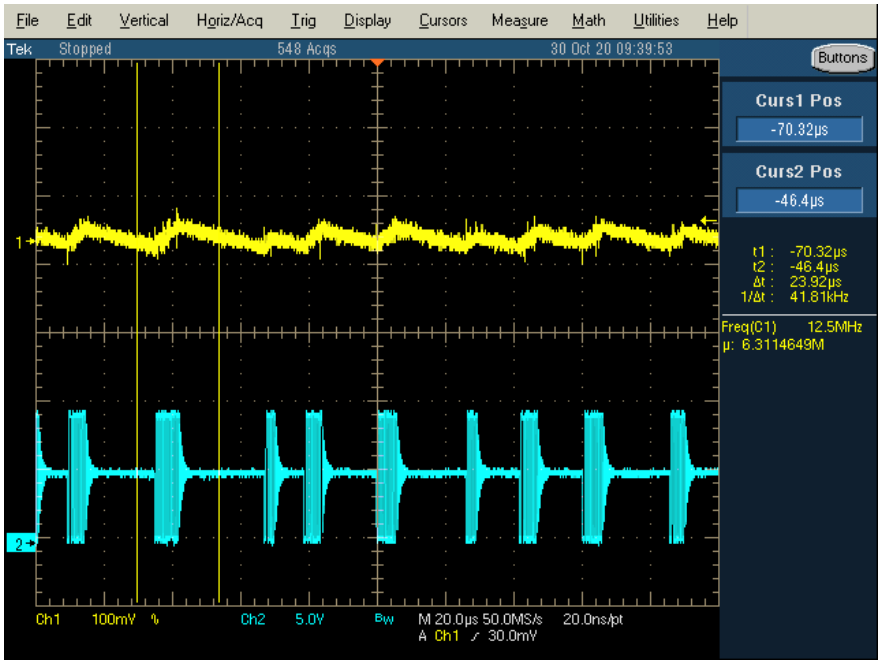


Figure 46. V_{POS} in Power-Save Mode

A few units are good, with a waveform very similar to the one of the datasheets:



If we replace the IC in a unit with the problem, with one from an older production date, the problem is solved. If we replace the IC with one of the same reel, the problem persists.

We have produced a preproduction lot of ten units, with the same hardware, but older chips, and none have this problem.

I think the problem is the same as the one that can be seen in:

https://e2e.ti.com/support/power-management/f/196/p/671424/2473050?tisearch=e2e-sitesearch&keymatch=tps65130#2473050