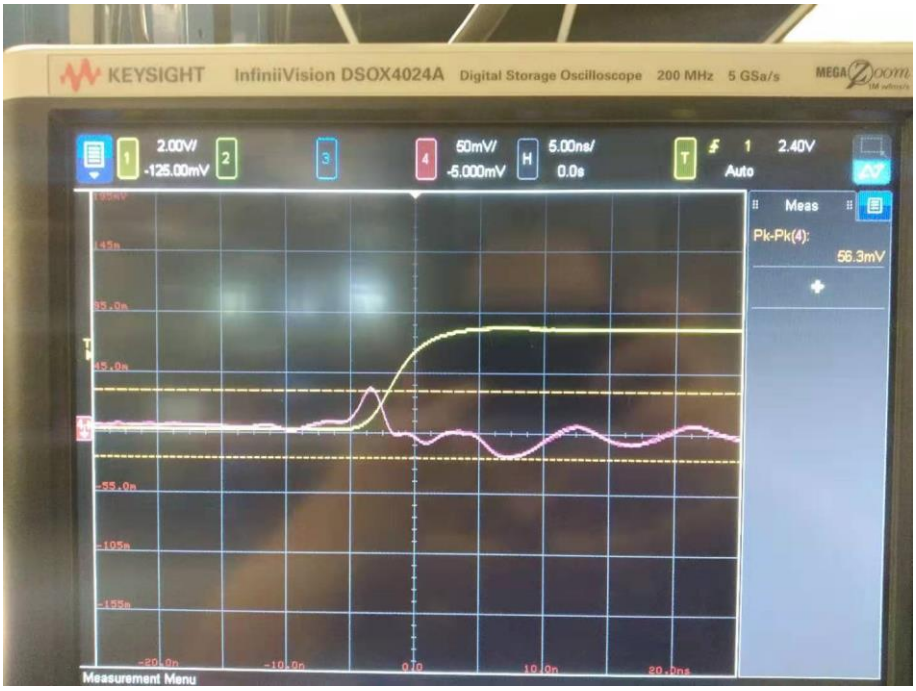
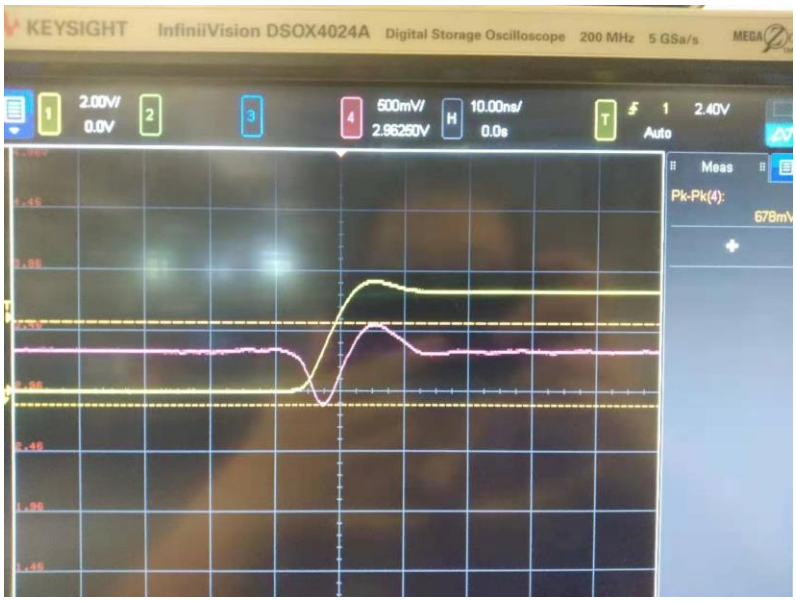
1. Comparison of switching noise of good and bad layout

(1) The quiet high output of good layout, p-p 132mV

(2) The quiet low output of good layout,p-p 56.3mV



(3) The quiet high output of bad layout, p-p 678mV



(4) The quiet low output of bad layout, p-p 428mV

From the traces above, it tells that the bad layout adds the great amount of noise.

There are three contributing factors:

(1) The good layout has a return plane, but the bad doesn't.
(2) The good has the decoupling cap near the IC, but the bad one has it far away.
(3) The signal traces of the good one is connected short with small loop inductance, while the bad one has very long wires.