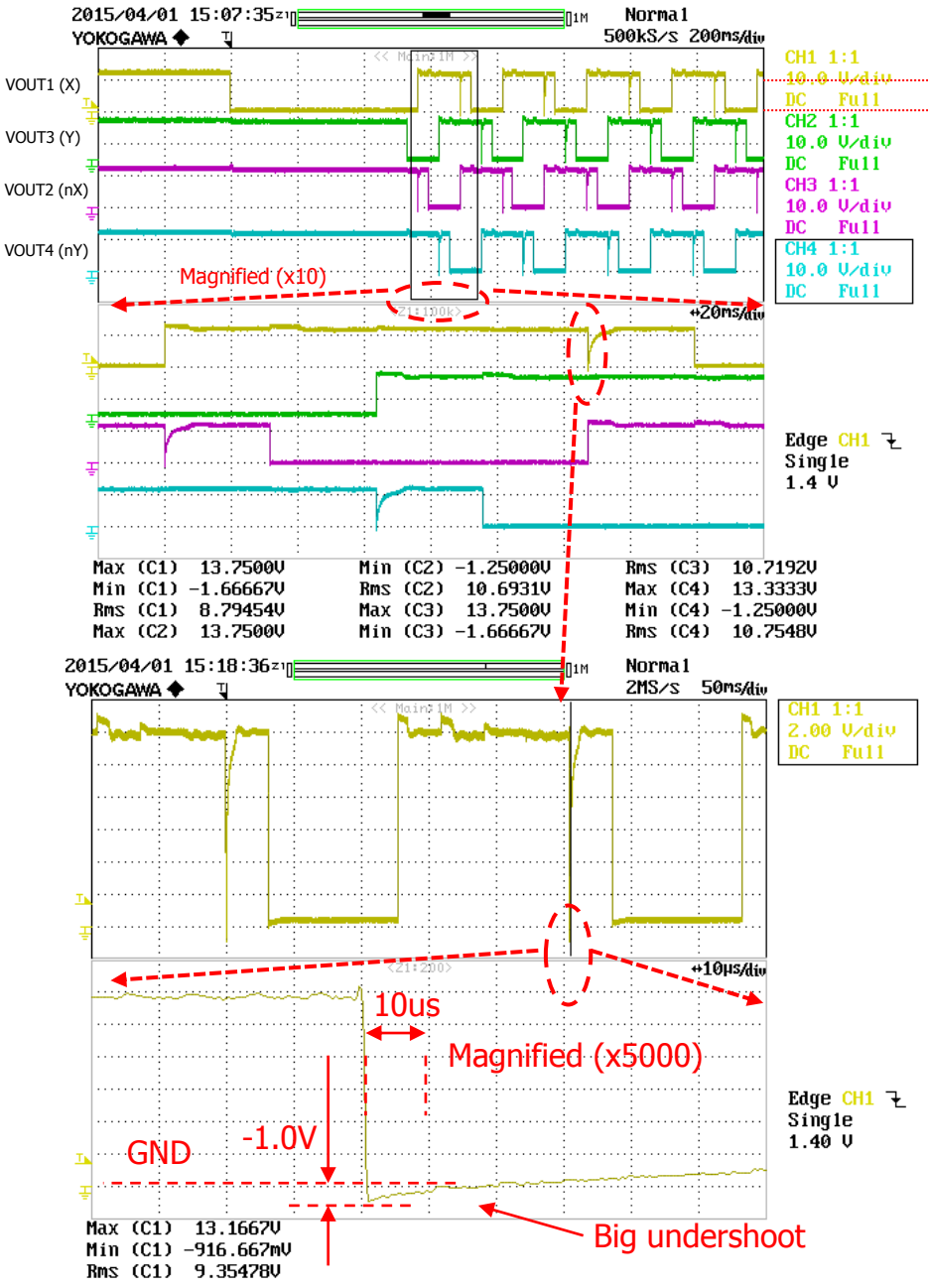
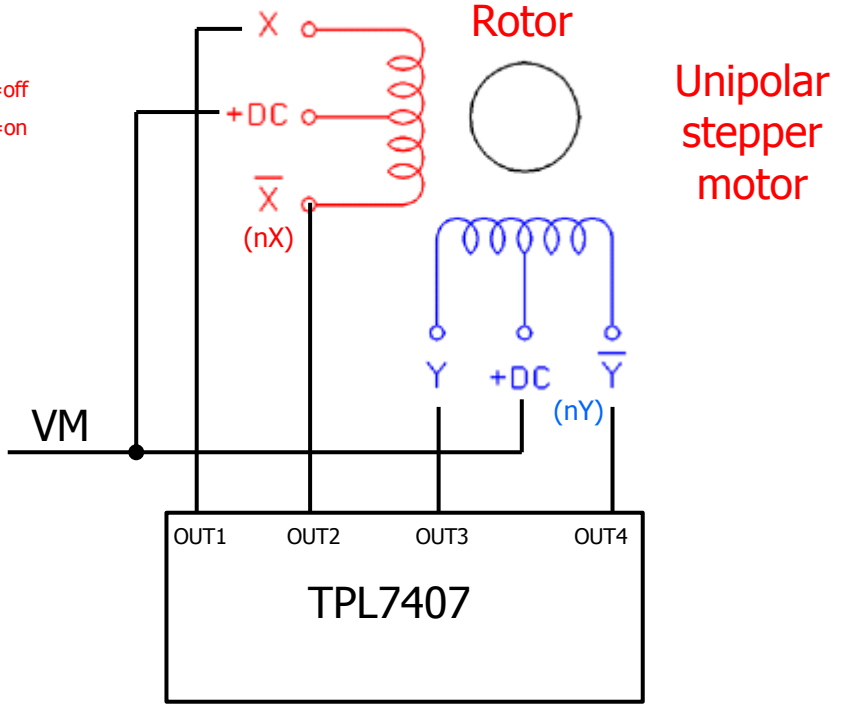
TPL7407 OUTn negative voltage waveform at step motor driving





We are driving a stepper motor by TI driver, TPL7407 using 1-2 phase excitation sequence.

When the stepper motor driven, big undershoot is observed and the overshoot negative voltage is less than -0.3V which is the negative value of absolute maximum at OUT1~7 terminal.

We know the negative voltage is generated at the coil when the other coil excitation is finished. Also we think the actual negative voltage is more than the observed level because the actual negative voltage is clamped around 1V by parasitic diode of NMOS of TPL7407 OUTn driver.

Our question is whether this negative voltage breaks TPL7407 or not and whether the voltage affects any problem on TPL7407.

If the answer is yes, is there any solution to reduce the negative voltage to safety voltage level.

Anybody, could you please give us your any comment?