

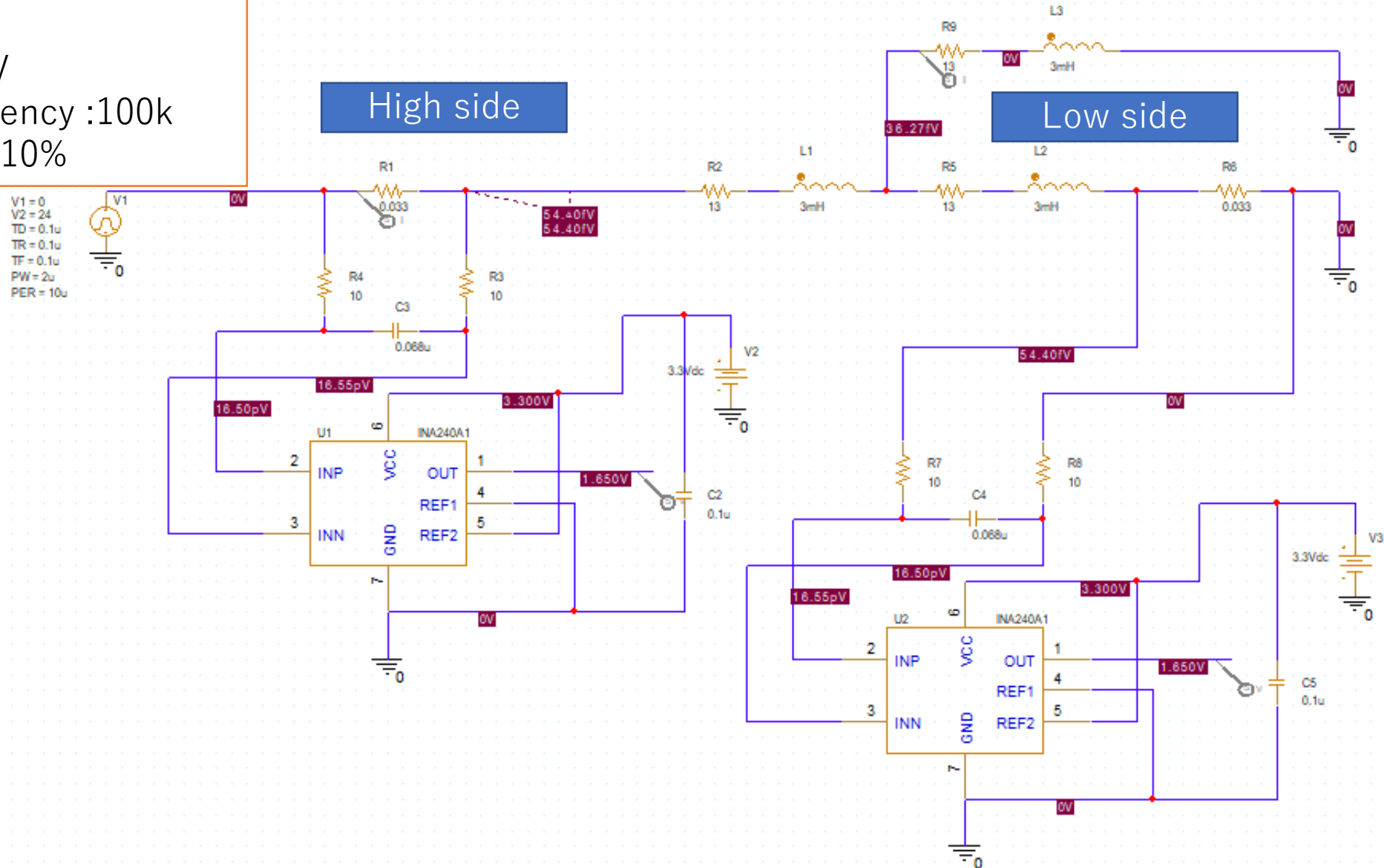
I made brushless DC motor's circuit model with PSpice for TI.
There are 2 INA240A1, it is assumed to measure motor current.
INA240A1's supply voltage is 3.3V

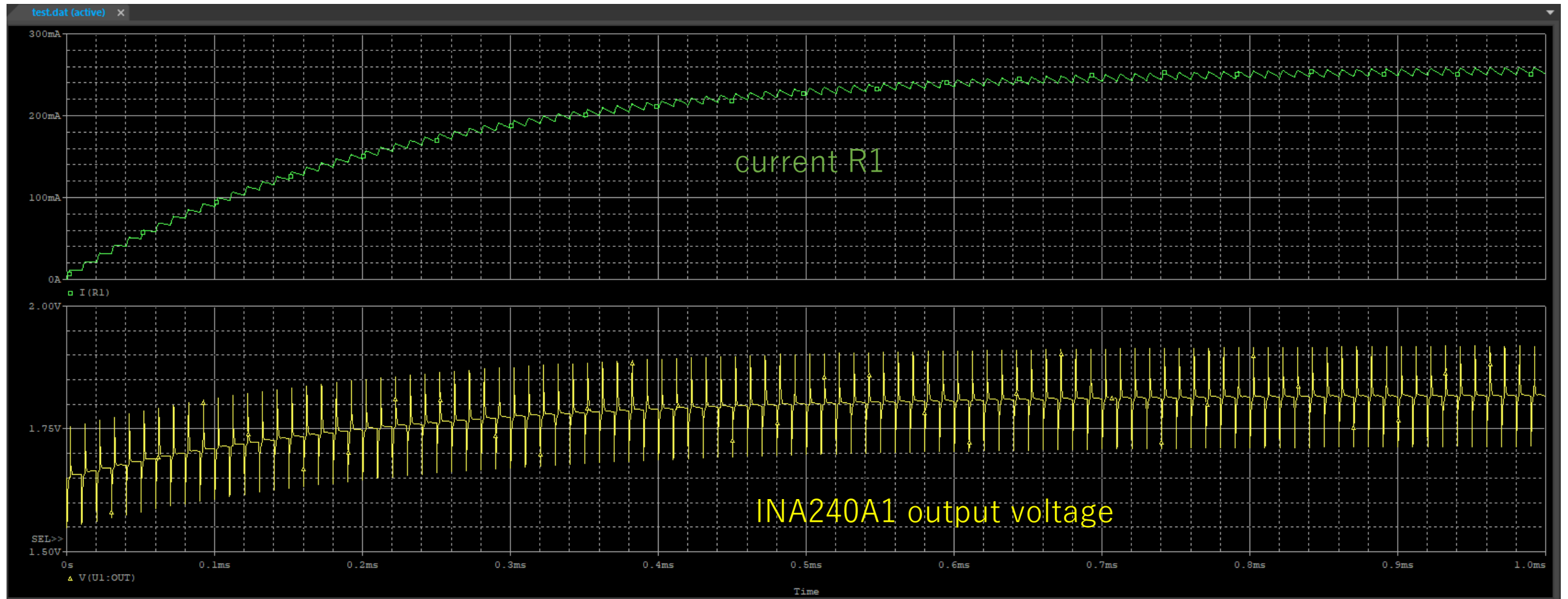
Condition

Voltage:24V

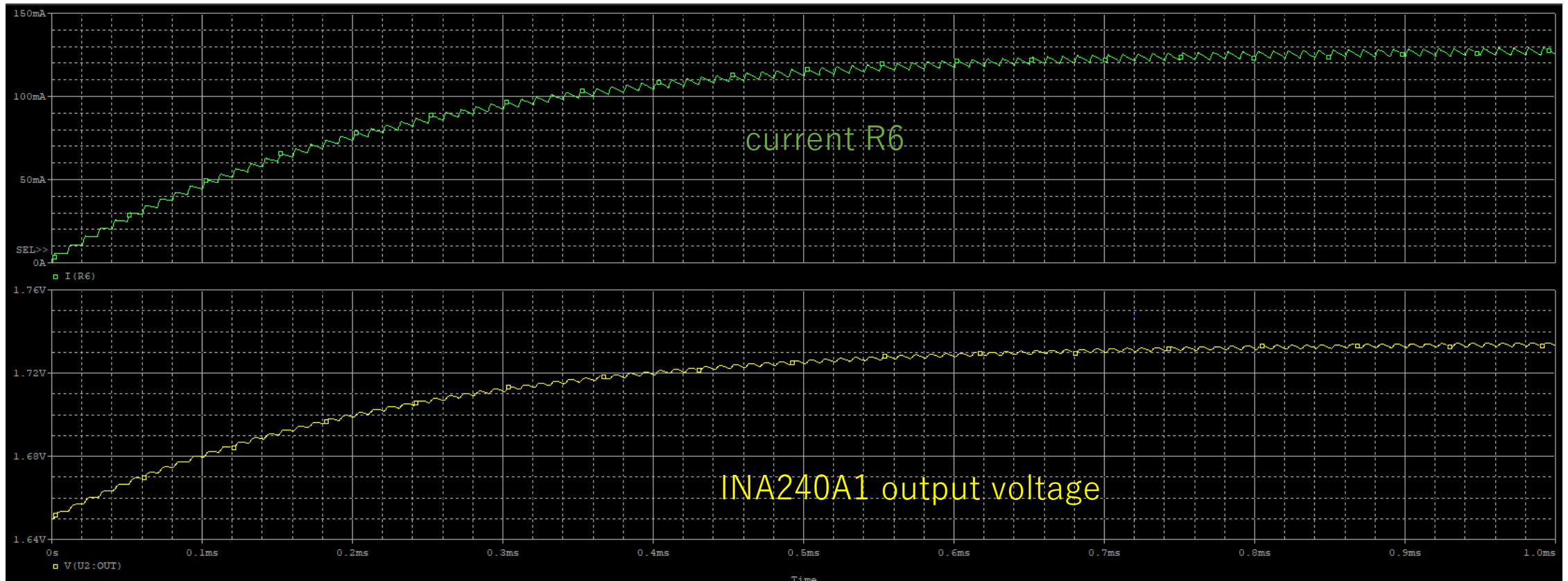
PWM frequency :100k

PWM Duty 10%



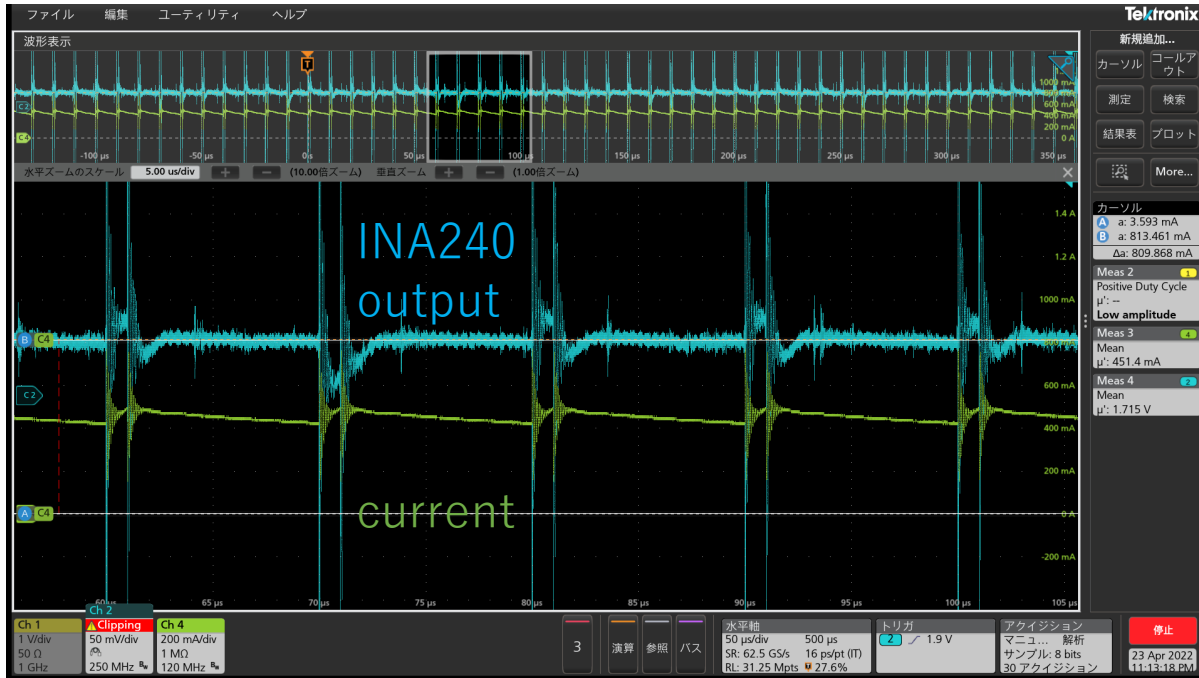


Current R1 flows described above(green) , but the INA240A1 output voltage described above(Yellow). Current R1 is assumed to describe High-side current of DC-brushless motor. The waveform does not match the behavior of the current waveform.

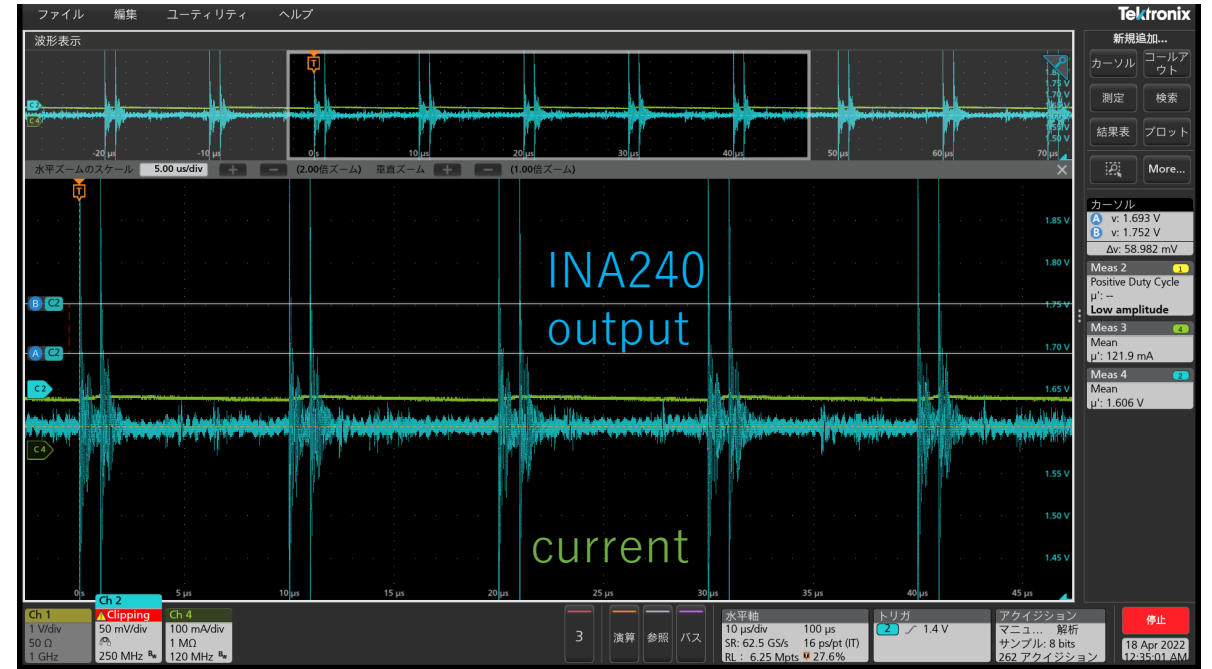


But INA240A1 current of R6 circuit can get similar voltage waveform of current waveform.

High-side current detection amp



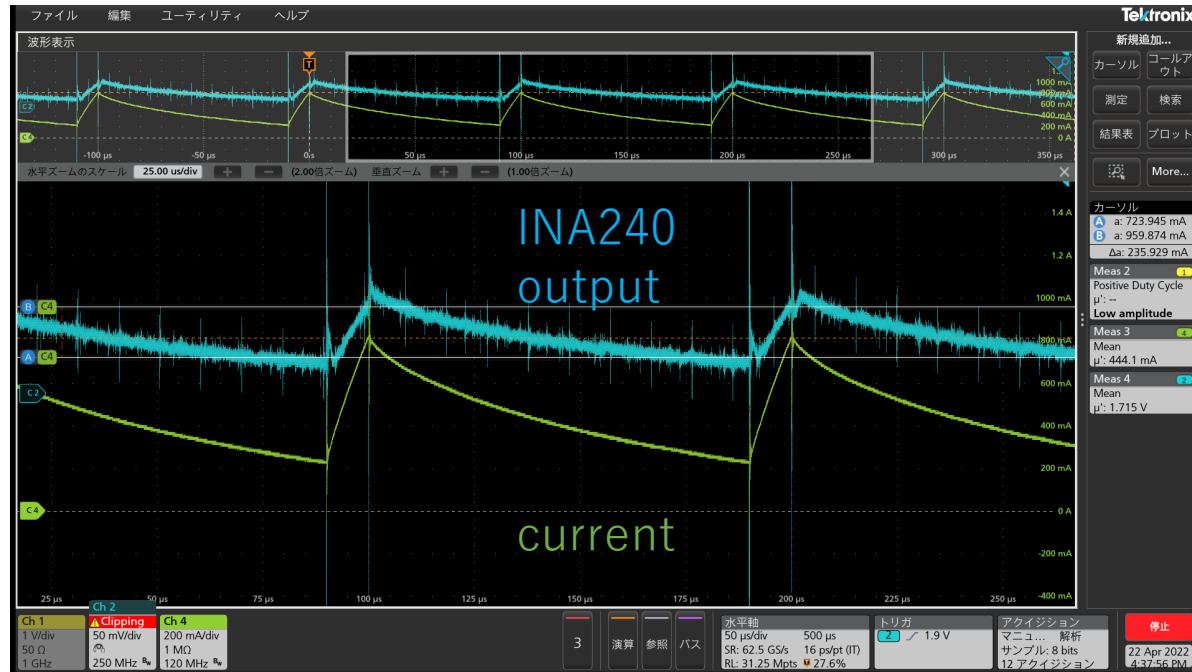
Low-side current detection amp



※This is the waveform when the PWM frequency is 100k and the PWM Duty is 10%.

This is the waveform measured with an oscilloscope in a similar circuit.
First of all, output of INA240 is not stable.
On the other hand, Low side current can get stable current detection amp.
I don't know the reason why high-side current amp's waveform is not stable.

High-side current detection amp



✂ This is the waveform when the PWM frequency is 10k and the PWM Duty is 10%.

A stable voltage could be obtained by lowering the PWM frequency.