UCC256302_Question about output rise failure at restart (Continued)

<Defect status>

・When the LLC_5V output is restarted, the output stops at 3-4V and does not reach 5V.

・The operation waveform at that time is as follows. What is the cause of such a waveform?

・ In the contents explained by TI until now, this recognition of the cause of this defect is due to a slew rate detection error.

(Refer to waveforms 1 and 2 and the pdf_VCR pin waveform attached last time)

This is a phenomenon.

According to your company's advice, UCC256302 and UCC256402 were mounted on UCC25630-1EVM-291 and compared. *

Our original remodeling prototype (2 outputs) has the same conditions as the PDF circuit diagram attached last time. *

The results are as follows.

<Results of using UCC256402>

With UCC256402, there is no output rise failure due to power re-on at present.

The phenomenon that the VCR terminal voltage rises to 7V with almost 100% establishment at the time of restart is repeated several times.

After that, the VCR voltage gradually increases in amplitude from the minimum value, and the output rises and operates stably. (Refer to waveforms 3～6)

<Both observation waveforms>

<Test conditions>

①Input voltage_DC390V, LLC output load: DC5 [V] 0 [A] (no load)

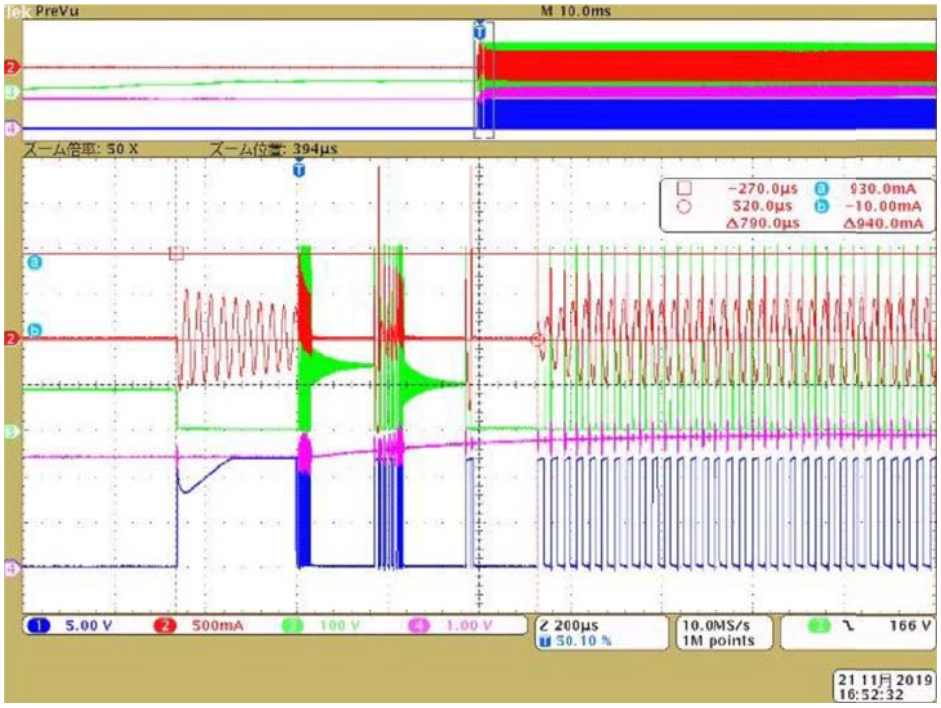
②Restart condition: When the output voltage gradually decreases from 5V to 3V by stopping input, turn on the power supply DC390V again.

1．UCC256302 measurement results

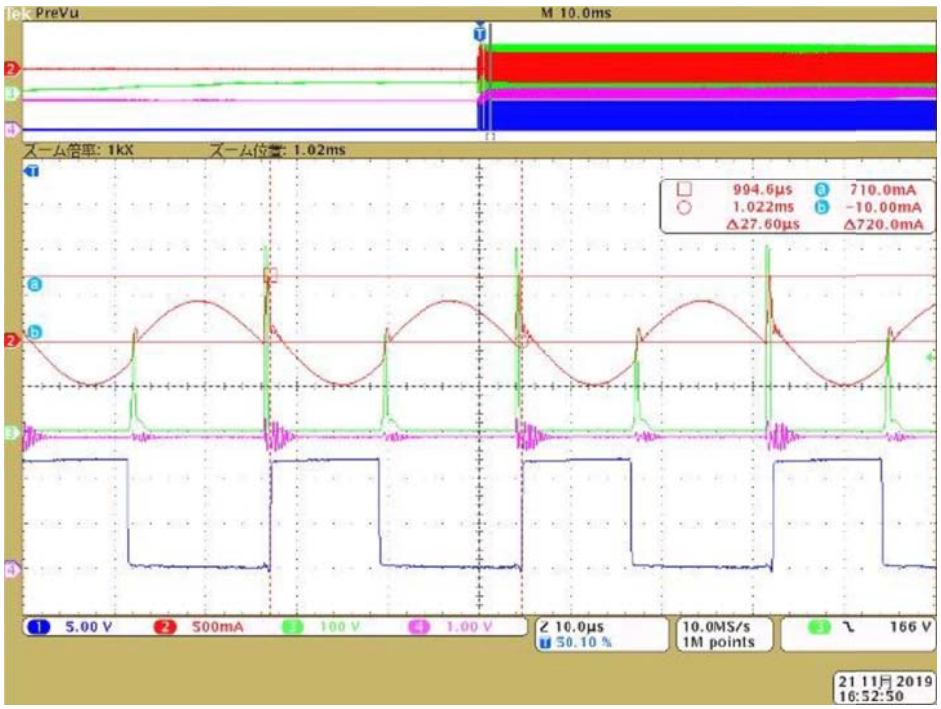
① Blue: L0 pin voltage [1V / div], ② Red: LLC input SW current [500mA / div],

③ Green: HS pin voltage [100V / div], ④Pink: 5V output voltage [1V / div]

1.1) Waveform 1



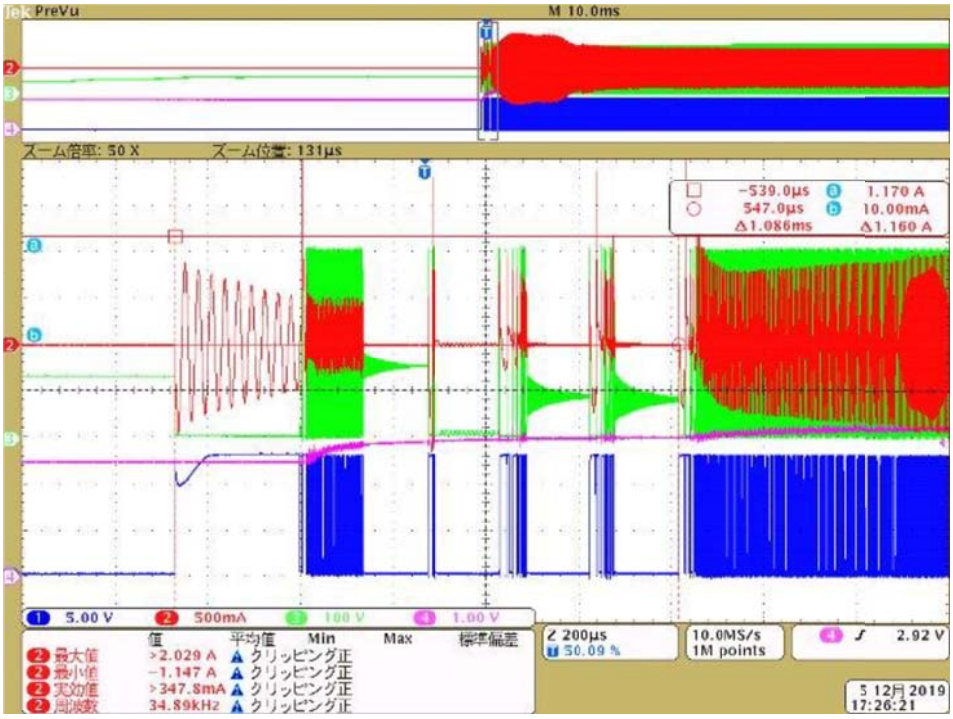
1.2) Waveform 2



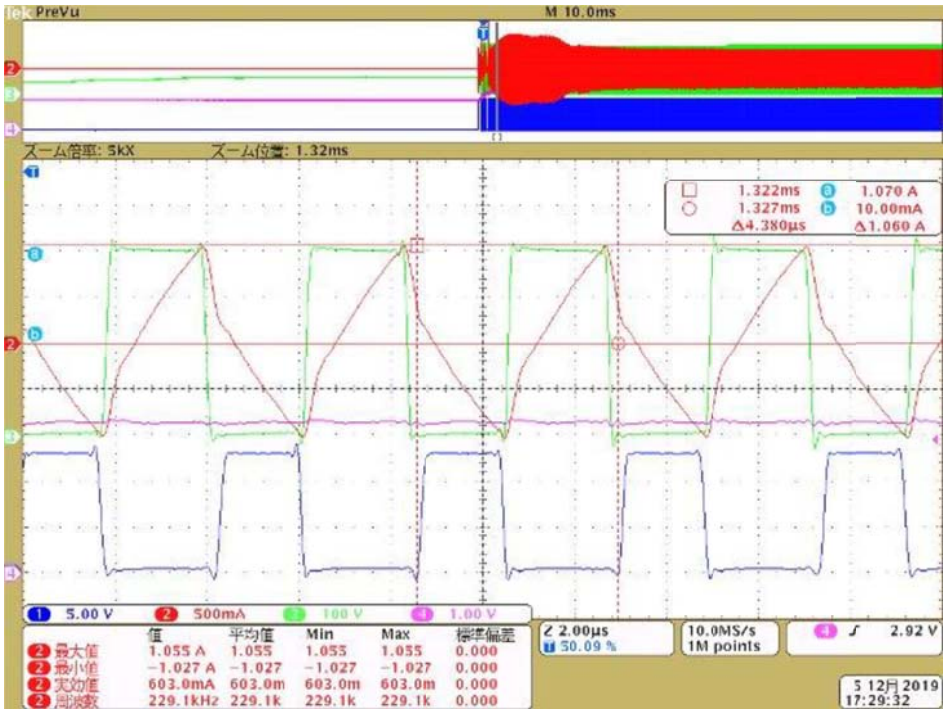
2．UCC256402 measurement results

① Blue: L0 pin voltage [1V / div], ② Red: LLC input SW current [500mA / div],
③ Green: HS pin voltage [100V / div], ④Pink: 5V output voltage [1V / div]

2.1) Waveform 3

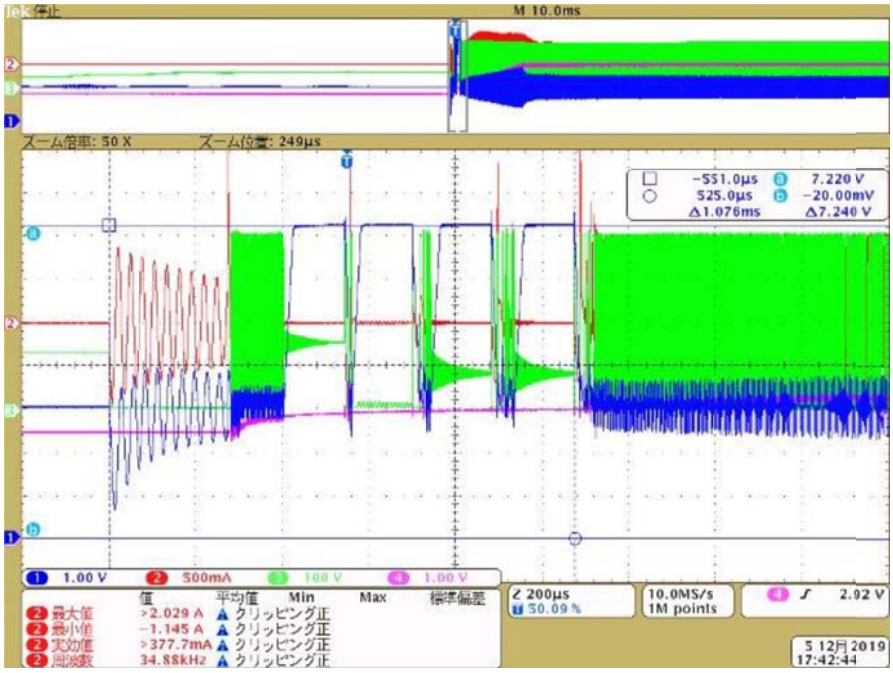


2.2) Waveform 4

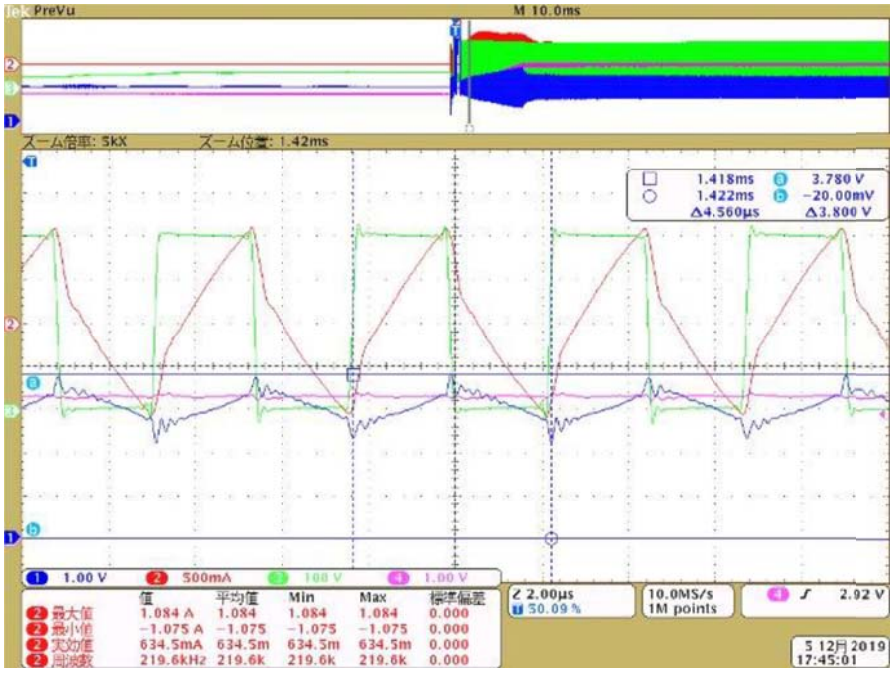


2.3) Waveform 5

① Blue: VCR pin voltage [1V / div], ② Red: LLC input SW current [500mA / div],
③ Green: HS pin voltage [100V / div], ④Pink: 5V output voltage [1V / div]



2.4) Waveform 6



<Question for both comparison results>

UCC256302 does not operate sine wave centered on DC3V when VCR voltage rises to 7V when restart is abnormal,

The waveform operates in the range of 3V to 7V, and this continues. What is the mechanism for this waveform operation?

When using UCC256402, the VCR voltage rises to 7V several times when restarting.

However, after that, the VCR voltage does not operate in a sine wave with a deviation of 3 to 7 VDC.

Slow start with normal symmetric waveform centered on DC3V.

The mechanism cannot be understood only by the difference in slew rate capability. Why is this difference?

In UCC256402, even if the slew rate detection fails at the time of restart and the VCR terminal rises to 7V,

Did you improve the control so that the sine wave does not sway beyond the center of 3V (lack of power transmission capability) after that?