Goals:

1) Compare the power-up of the sample 65 updated to ECN4736 (UCC2808A-1) to the start-up of a non-modified 2013 sample (UCC3808-1 J177) from batch 186477.

2) Exchange the PWM stages and check if the fault is linked to the PWM stage.

Results:

1) The 2013 unit, UCC3808-1 J177, starts at the 1st attempt, VCC drops but not low enough to cause a restart of the PWM chip.
Unit 65 does not start properly, the switching of the PWM chip does not maintain VCC high enough to maintain the switching continuous.

2) The fault is linked to the use of the UCC2808AD-1.
The problem does not seem to be linked to the ramp generated on the CS pin.
The problem seems to be an instability in the feedback causing a too low duty cycle for too long not keeping the voltage of the PWM chip in range.

Start-up test without load:

<u>**2013 sample:**</u>

UCC3808-1 J177:
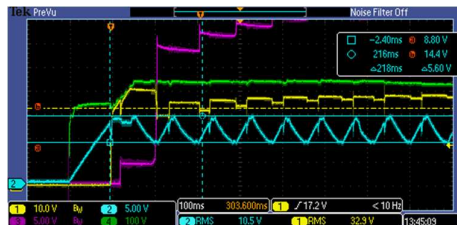Vcc raises up to ~14V before the switching starts.
Vcc drops to ~9.2V when the switching starts but that is not low enough to stop the switching.
The 35.8V rail and the PFC voltages build at the same time.
CH1: 35.8V rail, CH2: VCC UCC3808-1, CH3: OP1, CH4: PFC voltage
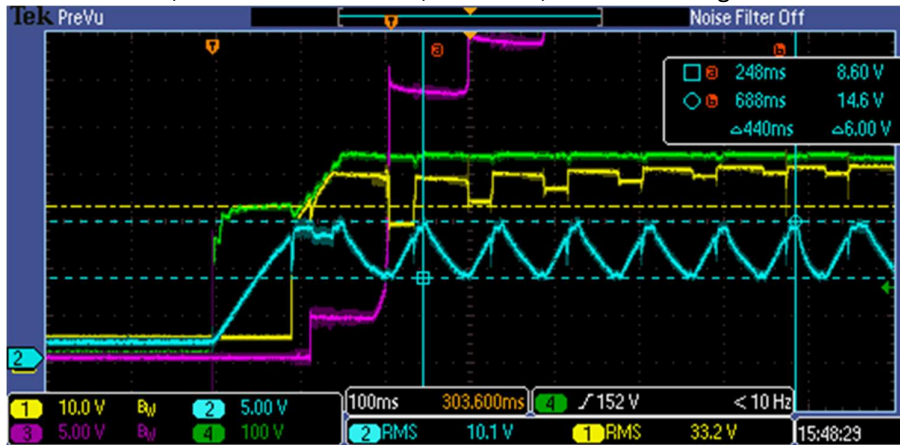

UCC2808AD-1:

During the oscillation, the 35.8V rail drops to 29.6V when the PWM chip stops and goes to 35.2V when the PWM chip restarts. The PWM chip seems to operate ~13ms after which the PWM command does not seem sufficient to maintain VCC. After ~58ms VCC drops below the operating

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voltage and the switching stops. The capacitor of VCC needs ~25ms before to reach again the start voltage.

Cycle ~100ms: 25ms charge up to start-up voltage,
                13ms PWM operates, VCC raises up.
                58ms PWM may operate but the duty cycle does not maintain VCC which drops until the chip stops

- The start-up oscillation problem is not due to an unexpected signal on the CS pin. The below scope capture shows a power-up with C69 shorted with exactly the same problem:
  CH1: 35.8V rail, CH2: VCC UCC3808-1, CH3: OP1, CH4: PFC voltage
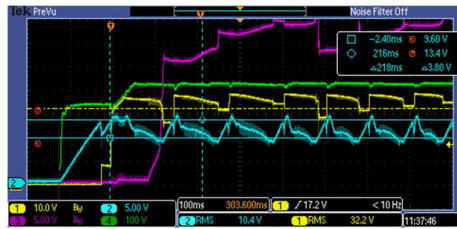

- Removal of C68 (compensation on U12)
  The PSU now starts up even if that shows 2 restarts.

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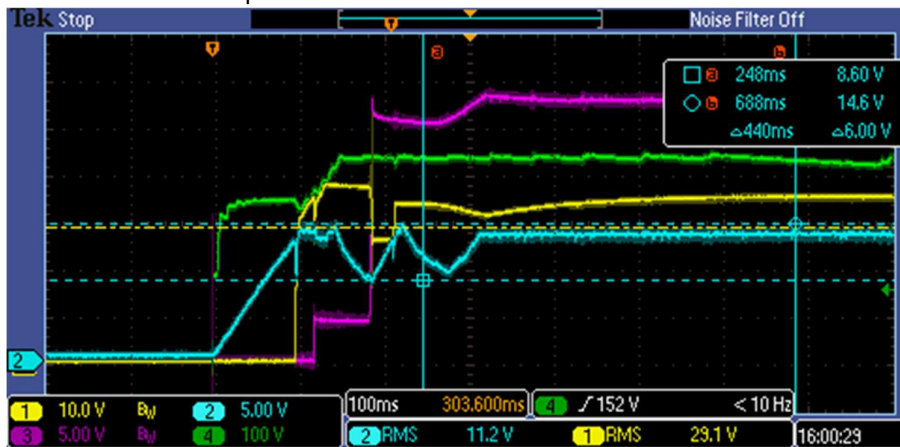
Sample 65:

UCC2808AD-1:

UCC3808-1 and J177 of 2013 sample:

It does not start on the 1st attempt, however, on the second VCC was maintained instead of dropping below the OFF threshold as per the UCC2808A.