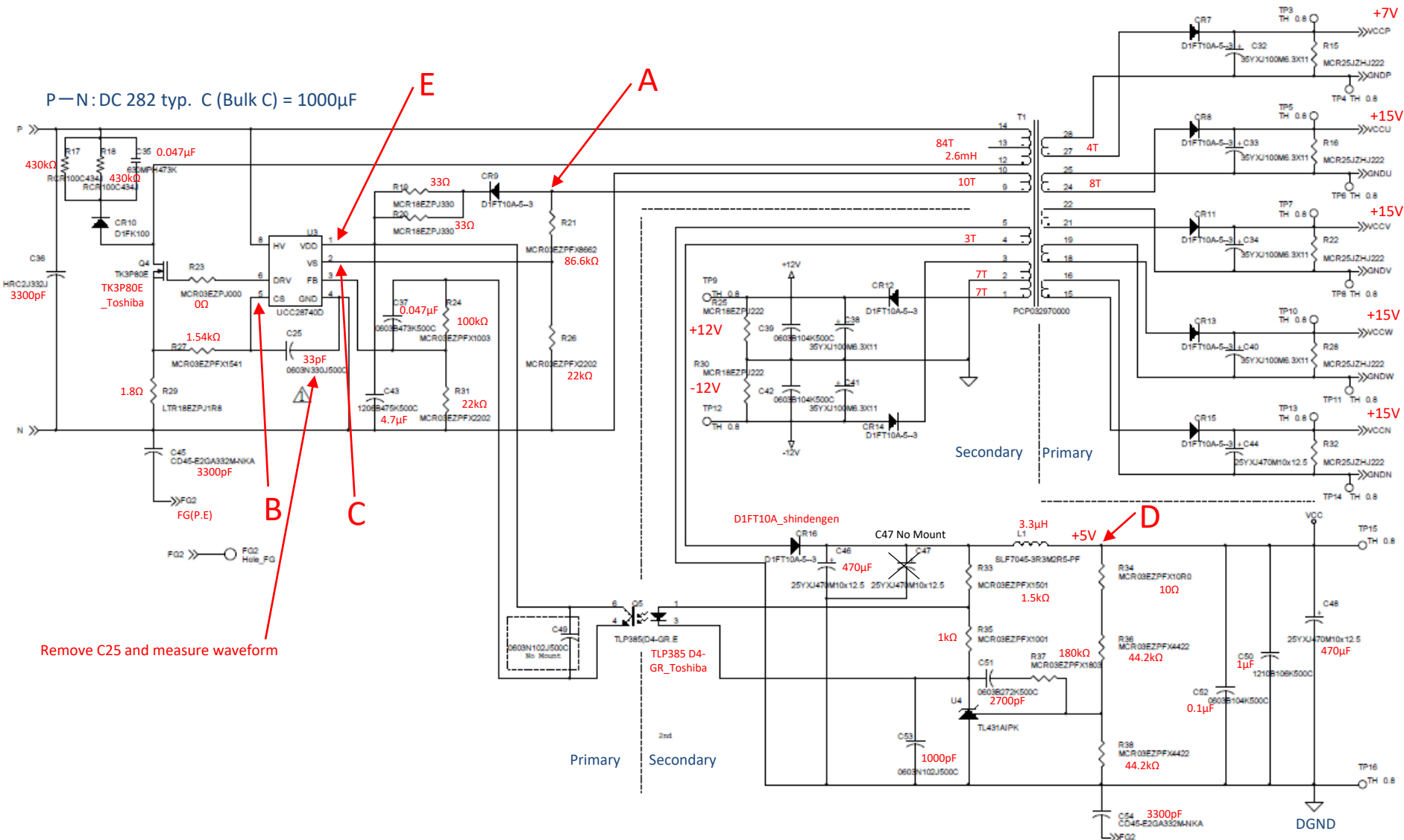The following circuit is constructed using UCC28740.

The voltage waveforms at points D (Vcc - DGND) were observed during power-on. I have a question about this waveform.

P－N : DC 282 typ.  C (Bulk C) = 1000μF

Remove C25 and measure waveform

+7V

+15V

+15V

+15V

+15V

+5V

Secondary | Primary

Primary | Secondary

DGND

● Point D waveforms at Power on.

Output voltage may drop in very rare cases during power supply startup. (Some protection function may be activated and oscillation may stop.)

This phenomenon occurs more frequently when C25 (33pF) on the CS pin is removed, which suggests that the overcurrent protection is working to stop oscillation.
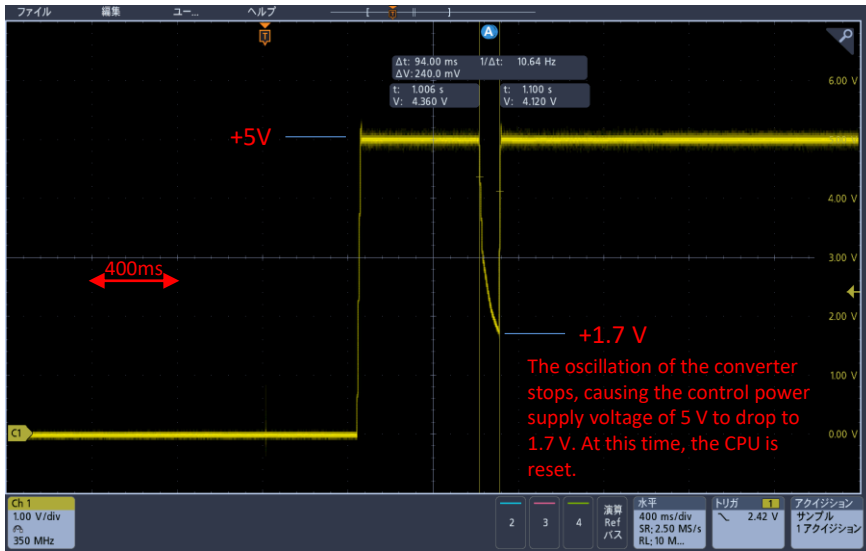


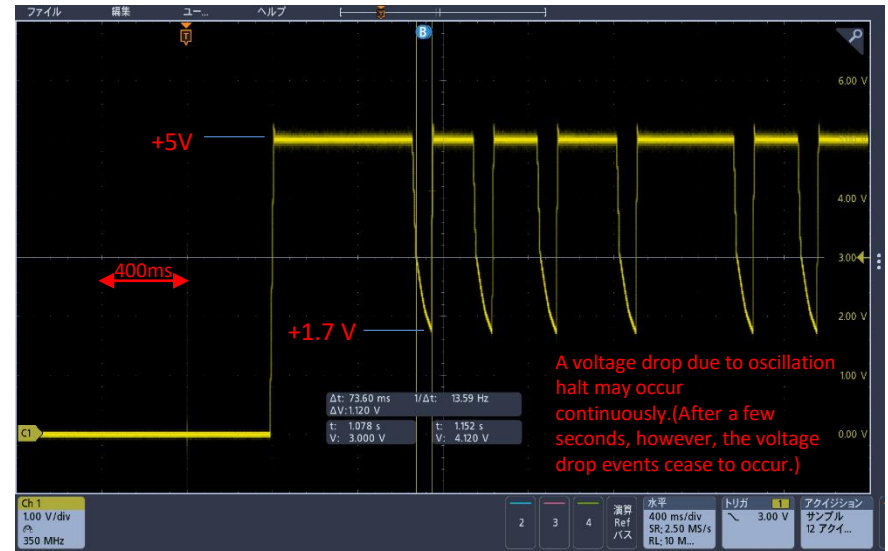Fig.1 : Startup control power supply voltage ＋5 V
Pattern1 （C25 uninstalled (0 pF)）

Fig.2 : Startup control power supply voltage ＋5 V
Pattern2 （C25 uninstalled (0 pF)）

In both cases, a voltage drop event occurs immediately after startup. Thereafter (after a few seconds), this phenomenon will no longer occur.

● Q1    I presume that the overcurrent protection is working, but are there any other possibilities?

● Q2    If the overcurrent protection is working, I think that increasing the capacity of C25 would be a countermeasure, but is there any other effective way?

● Waveforms of each part when oscillation stops (some protection function is activated)

The waveforms of each part were observed at the moment when the oscillation stops at startup.
（C25 is not mounted.）

Also, This startup oscillation stop does not occur when the Vs pin(point C) is observed in oscilloscope (probe connection).
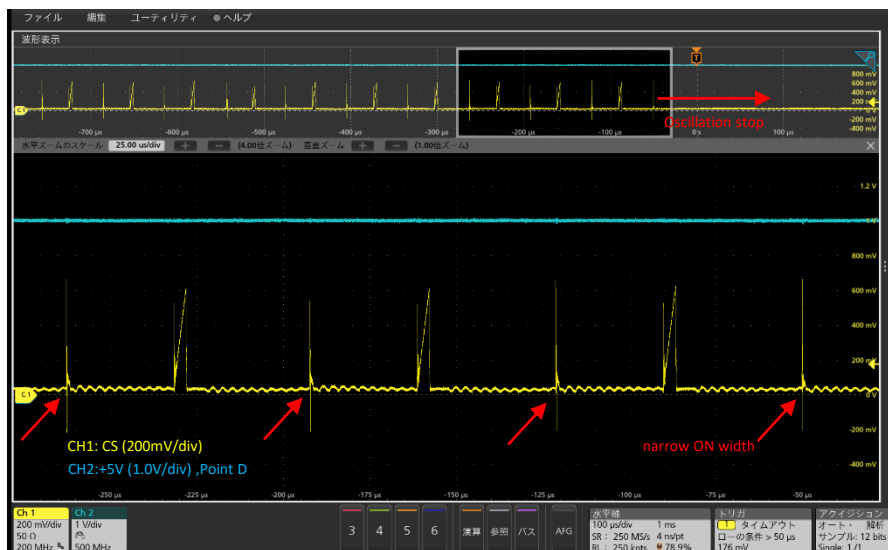


Fig.3 : CS pin（Point B）waveform just before oscillation stops
　　　（C25　uninstalled（0 pF））



Fig.4 : CS pin（Point B）waveform just before oscillation stops
　　　（C25　uninstalled（0 pF））

※ CH1 is measured using isolation probe ( IsoVu(TIVPMX10X) :Tektronix )

The ON width of the FET is not stable just before oscillation stops.
Also, the CS value just before the stop is not at the level of the OCP.
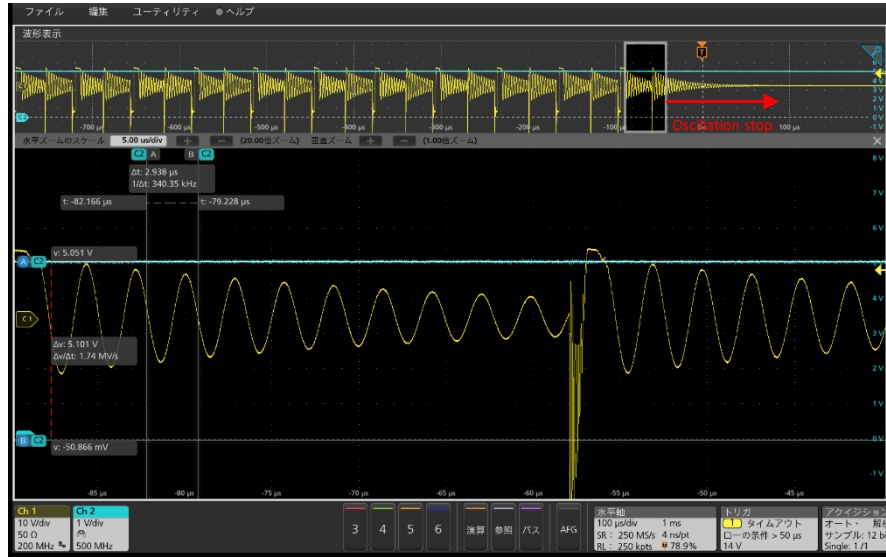However, there is no abnormality in +5V or VDD.

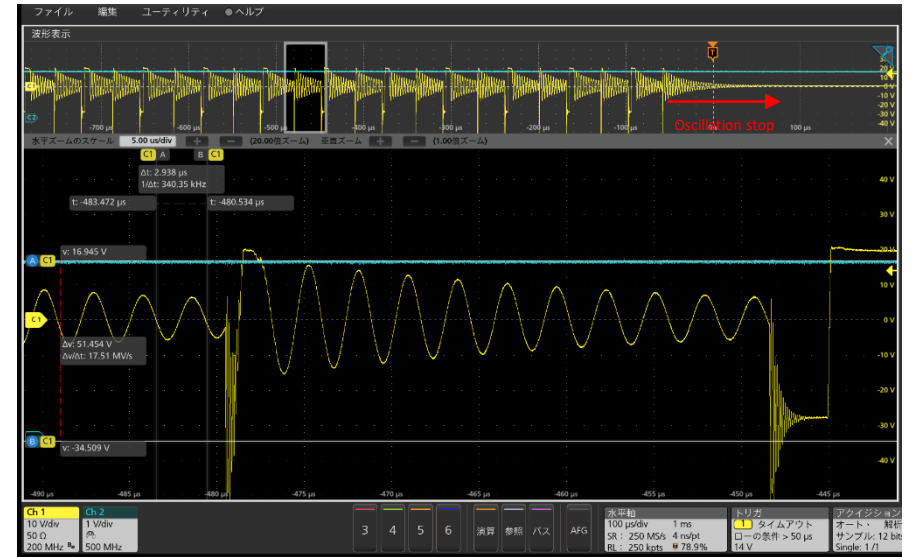Fig.5 : CR9−A（Point A）waveform just before oscillation stops
（C25 uninstalled (0 pF)）

Fig.6 : CR9−A（Point A）waveform just before oscillation stops
（C25 uninstalled (0 pF)）

CR9-A was observed because the oscillation halt phenomenon disappears when the probe is connected to Vs.

The above waveform also shows that the ON width of oscillation is narrow just before stopping.

What is the protective function detected by the IC at this time?