

Hello Hagan,

There is an application note on troubleshooting PSR (UCC28700) controllers that you might find helpful that can be found at the following link.

<http://www.ti.com/lit/pdf/slua783>

A common issue with these controllers is the aux signal is compromised due to poor transformer design and has excessive ringing on the transformer that triggers an OVP event. Please note the following excerpt from the data sheet gives guidelines for what the aux signal should look like for proper operation. Please note an OVP can be triggered between the end of TLK_RESET timing and the end of TSMPL.

The UCC28700 VS signal sampler includes signal discrimination methods to ensure an accurate sample of the output voltage from the auxiliary winding. There are however some details of the auxiliary winding signal to ensure reliable operation, specifically the reset time of the leakage inductance and the duration of any subsequent leakage inductance ring. Refer to Figure 14 for a detailed illustration of waveform criteria to ensure a reliable sample on the VS pin. The first detail to examine is the duration of the leakage inductance reset pedestal, T_{LK_RESET} in Figure 14. Because this can mimic the waveform of the secondary current decay, followed by a sharp downslope, it is important to keep the leakage reset time less than 500 ns for I_{PRI} minimum, and less than 1.5 μ s for I_{PRI} maximum. The second detail is the amplitude of ringing on the V_{AUX} waveform following T_{LK_RESET} . The peak-to-peak voltage at the VS pin should be less than approximately 100 mV_{p-p} at least 200 ns before the end of the demagnetization time, t_{DM} . If there is a concern with excessive ringing, it usually occurs during light or no-load conditions, when t_{DM} is at the minimum. The tolerable ripple on VS is scaled up to the auxiliary winding voltage by R_{S1} and R_{S2} , and is equal to $100\text{ mV} \times (R_{S1} + R_{S2}) / R_{S2}$.

Device Functional Modes (continued)

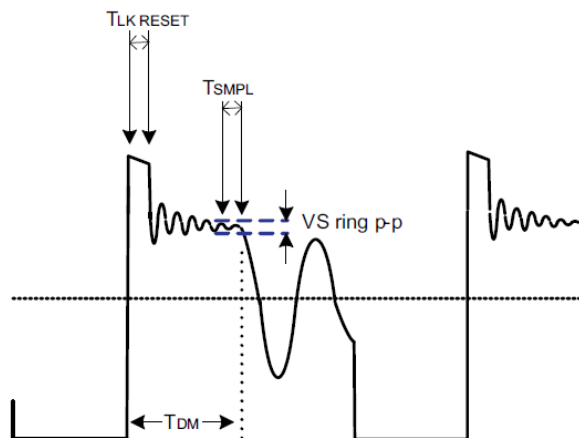


Figure 14. Auxiliary Waveform Details

The OVP trip point is VS of 4.6V and it is recommended that you evaluate this trip point by probing the aux winding and calculating the VS voltage based on the VS resistor divider. This is because this pin is

noise sensitive.

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNITS
PROTECTION						
V _{OVP}	Over-voltage threshold	At VS input, T _J = 25°C	4.52	4.6	4.68	V
V _{OCP}	Over-current threshold	At CS input	1.4	1.5	1.6	

If you determine that the fault is due to OVP and transformer ringing. You can add RC snubbers across the output rectifier diode. RCD clamp on the high side may also work for dampening some of the ringing.

Designing a transformer with the lowest inter winding capacitance and a primary leakage inductance of less than 3% is also recommended.

Regards,

Mike