

LNK623 Flyback instability

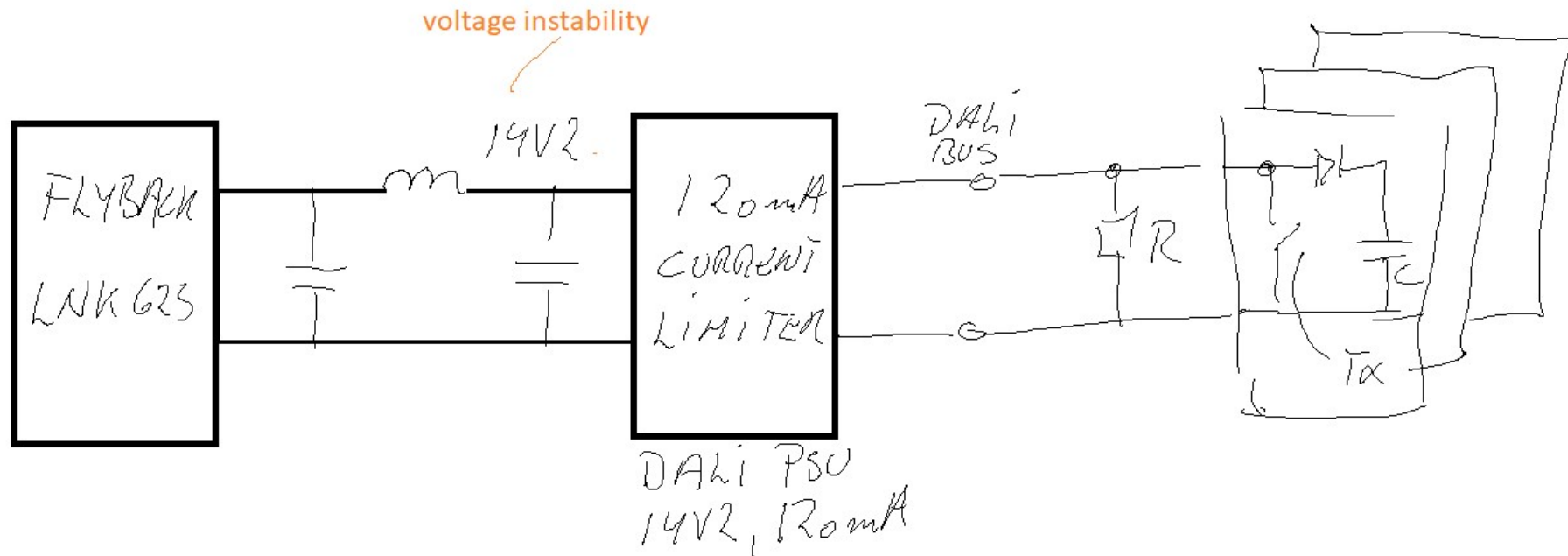
DALI Application description

We use a LNK623DG as a switcher in a flyback controller to produce 14.2V DC

This voltage is used to power a DALI bus, where an current limiter makes sures that no more than 120mA_{peak} is drawn.

The DALI bus have power and 1.2kHz communication on the same 2 wires.

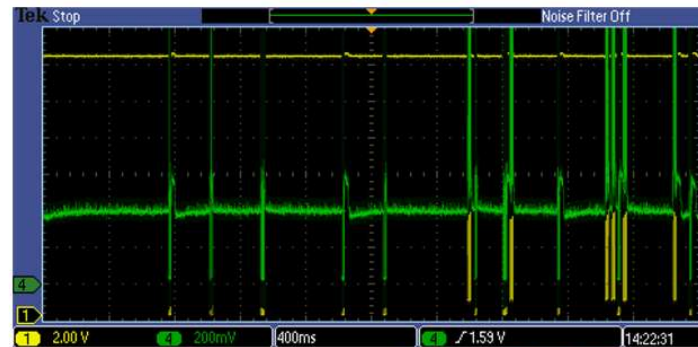
We experience a voltage instability on the 14.2V in operation :



Scope screen shots of instability

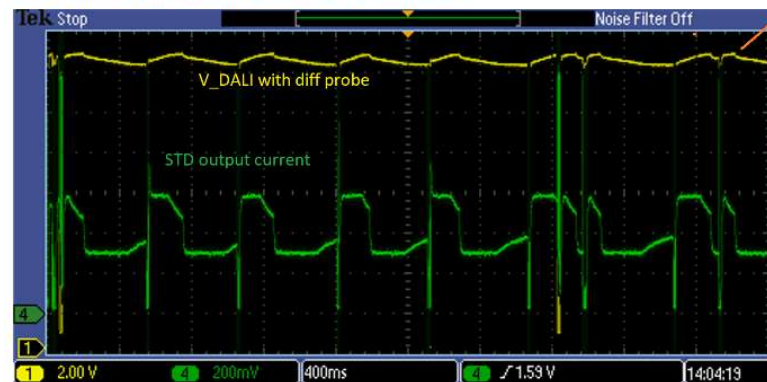
- 230VAC
- 3-5 BMS connected on DALI
- 2 pressure contact inputs
- DALI standard flush 230VAC as PSU

MLA old std flush model #9
"not PSU modified"



MLA setup, 5pcs BMS mounted on one DALI standard flush

Voltage instability $\Delta V = 1V$

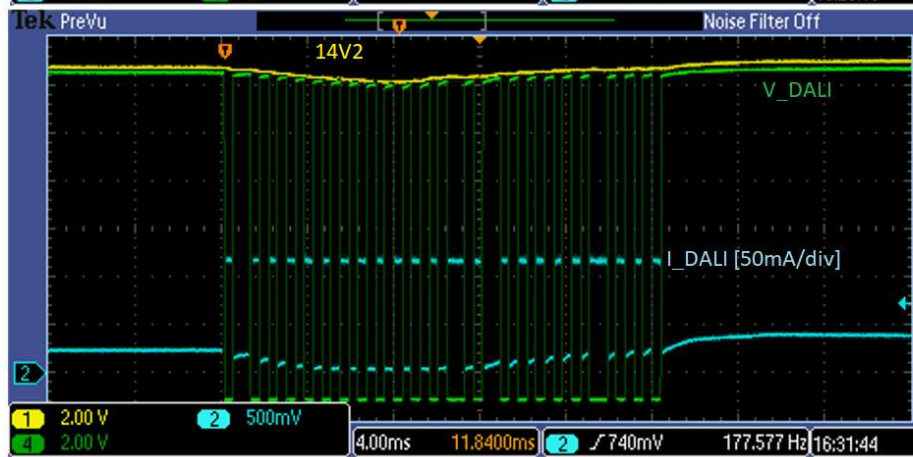
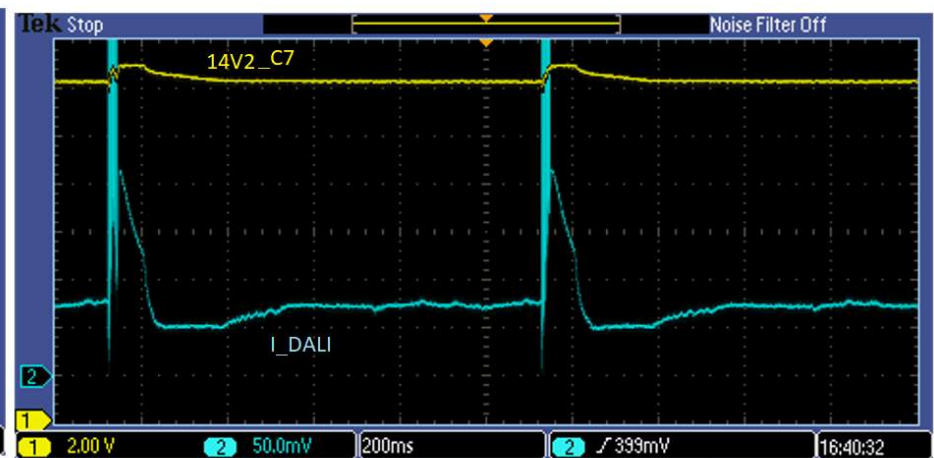
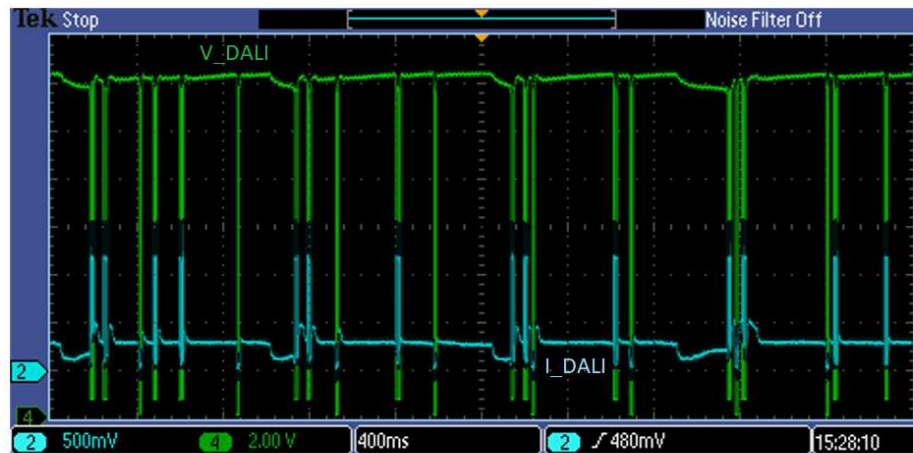


New DALI comfort flush prototype sample A



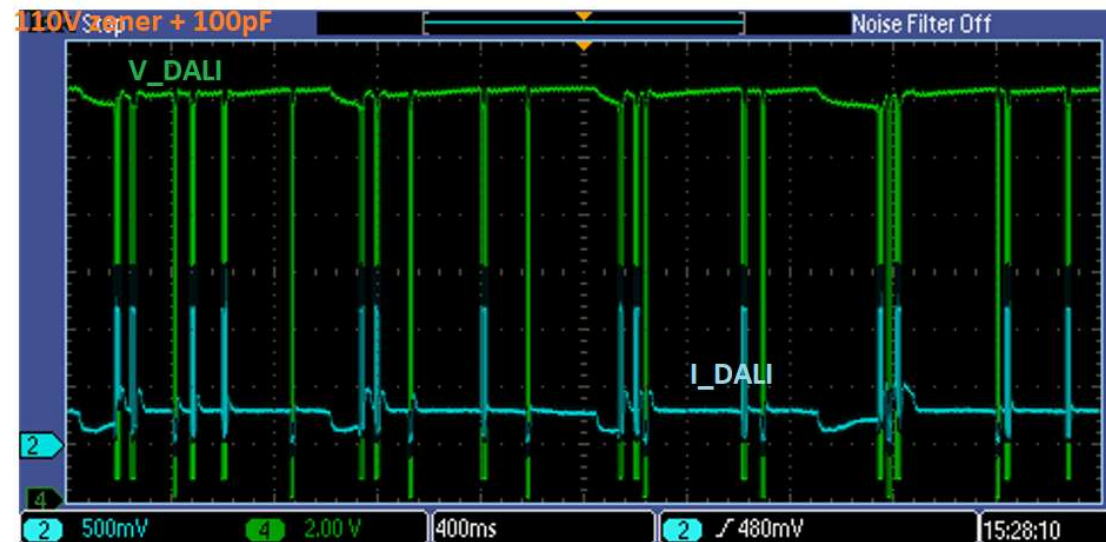
New DALI comfort flush prototype sample B

Description of instability

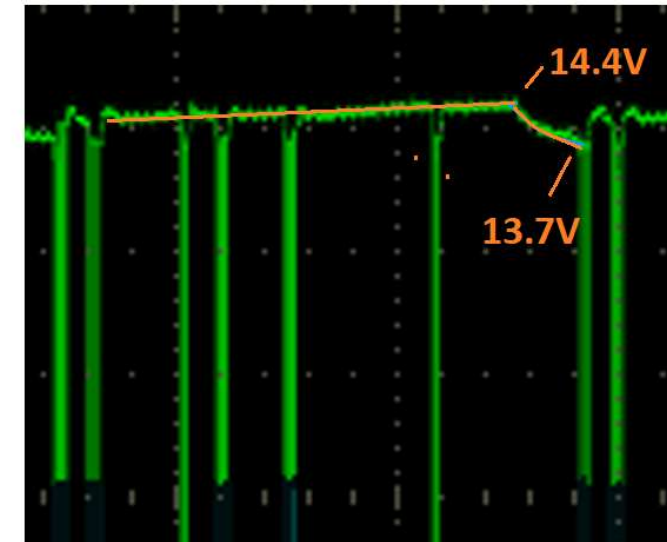


The 24.2V slowly start to increase to 14.4V and then suddenly drops to 12.7V

230VAC, DALI std. flush + 3x BMS in walk test

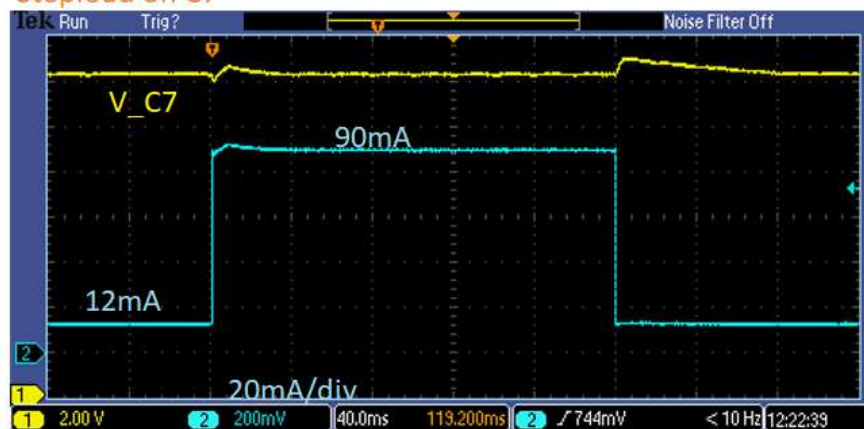
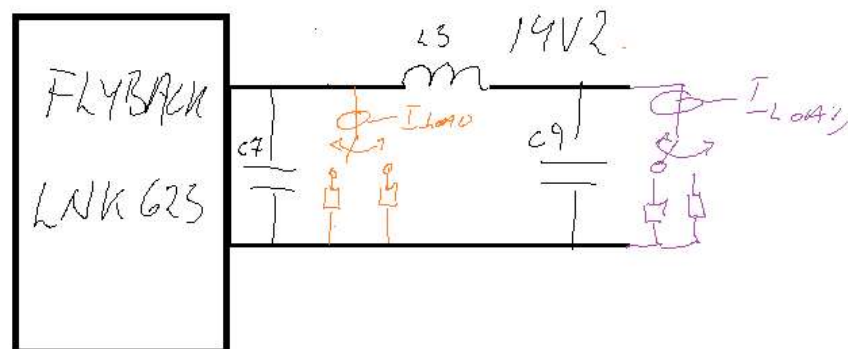


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- Why does this happen ?
- Why does it climb to 14.4V and then suddenly drop to 13.7V
- Can we count on these rise- and fall voltages to be stable ?

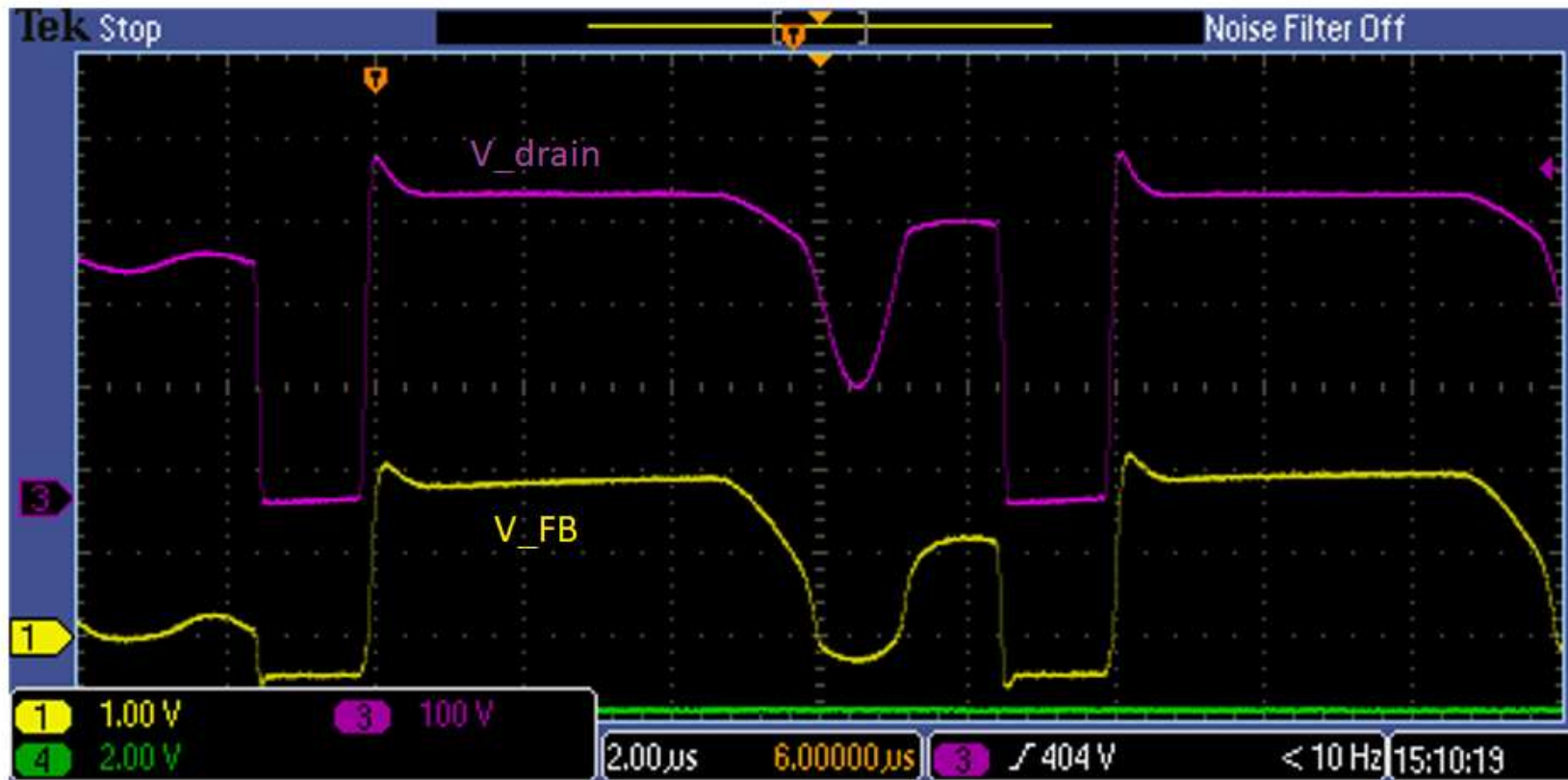
Ohmic stepload, not DALI bus related and without current limiter :



L3 does not introduce instability

Measurements of flyback voltages

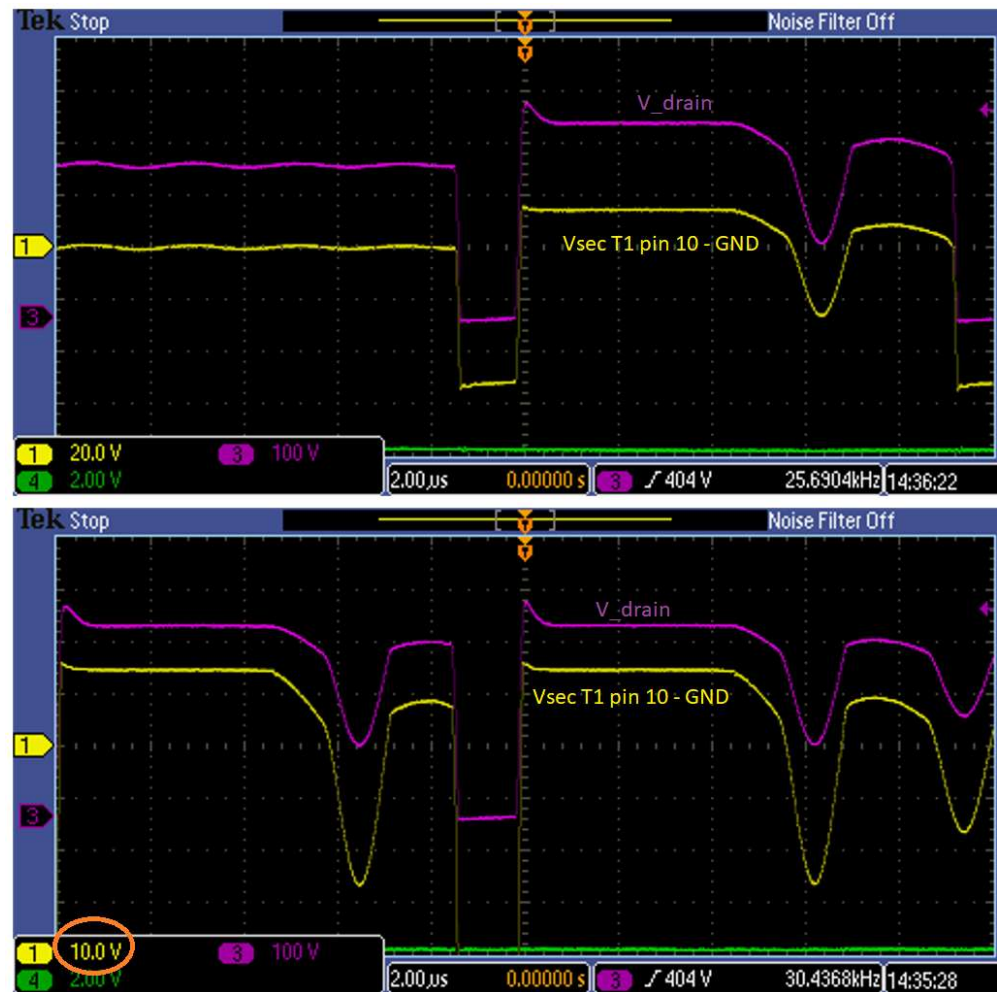
V_{drain} and V_{FB}



R1=33k, slow orig. D5, cap over R5 = 33p

Note ; No ripple that can interfere with sampling at 2.5usec after turn-off

V_{drain} and V_{secondary} side



Note : no excessive secondary ripple that can explain voltage runaway.

Open questions :

- Is it poor cross regulation ?
- Is it pulse grouping ?
- Is it a light load problem ?
- Why does it climb a little and then drop approximately 1 volt ?
 - o Can we count on this behavior to be consistent ?

It helps to add a 2.2kR / 6mA DC load on the DALI bus.

In this video, first 20 seconds is without extra DC load and after 20.seconds with 6mA extra load on 14V2.



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