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# Test Procedure for the NCL30125 300-W/5-V Evaluation Board

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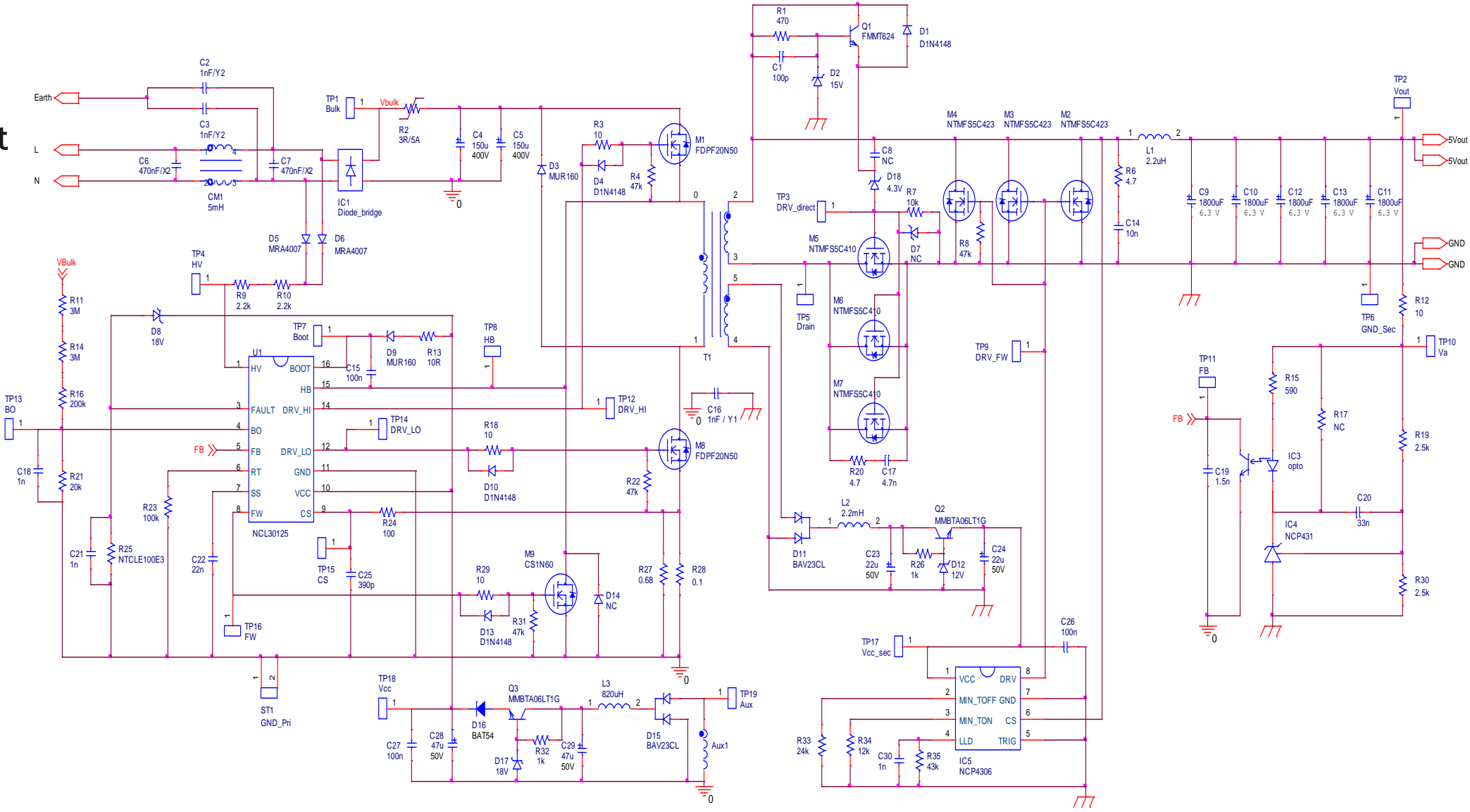
Public Information



# Board Electrical Schematic

Ac input voltage

Dc output voltage



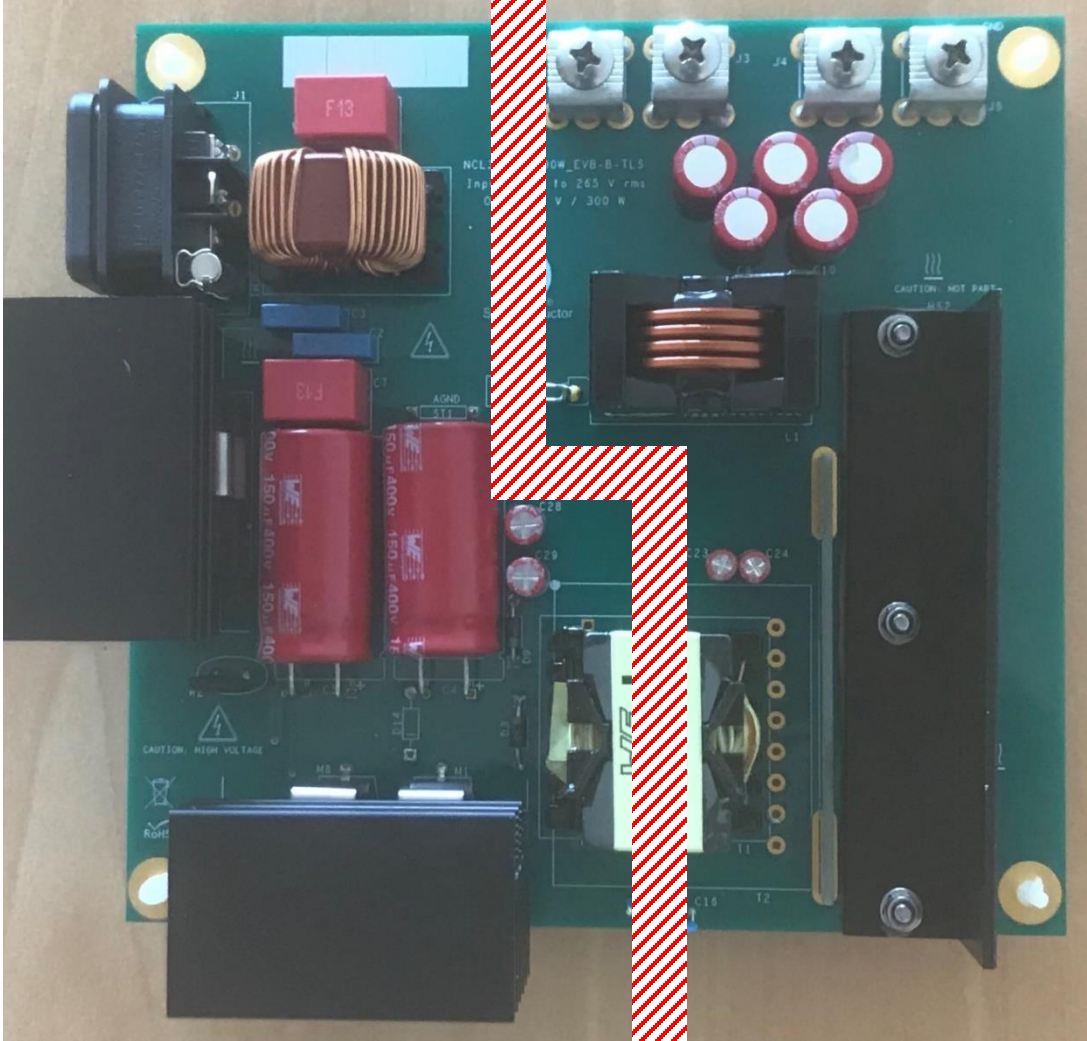
# Board Picture

Live parts, lethal voltages



Isolated output

Input voltage from  
176 V rms to 265 V rms



Output voltage is 5.0 V  
Nominal current is 60.0 A



# Needed Equipment

- The needed equipments are the following:
  - ✓ An ac source (176 to 265 V rms, 60 / 50 Hz), needed power is below 30 W
  - ✓ An input ac watt-meter, up to 400 W and 265 V rms
  - ✓ A dc load absorbing up to 10 V,  $V_{in(max)} < 10 \text{ V}$ ,  $I_{out(max)} < 70 \text{ A}$
  - ✓ Usually, dc electronic load can display dc V and dc A. If not, an voltmeter and ampmeter will be needed
  - ✓ An oscilloscope with single shot capability
- *If the load does not use local Kelvin sensors, then the output voltage must be measured at the board level, not at the cable ends.*

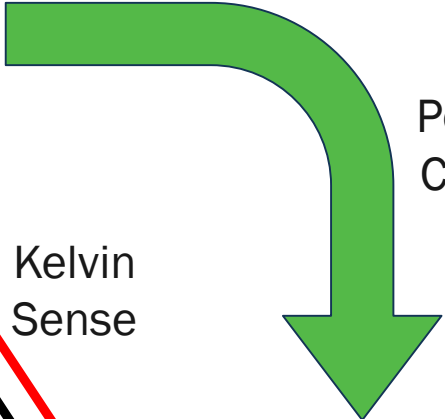
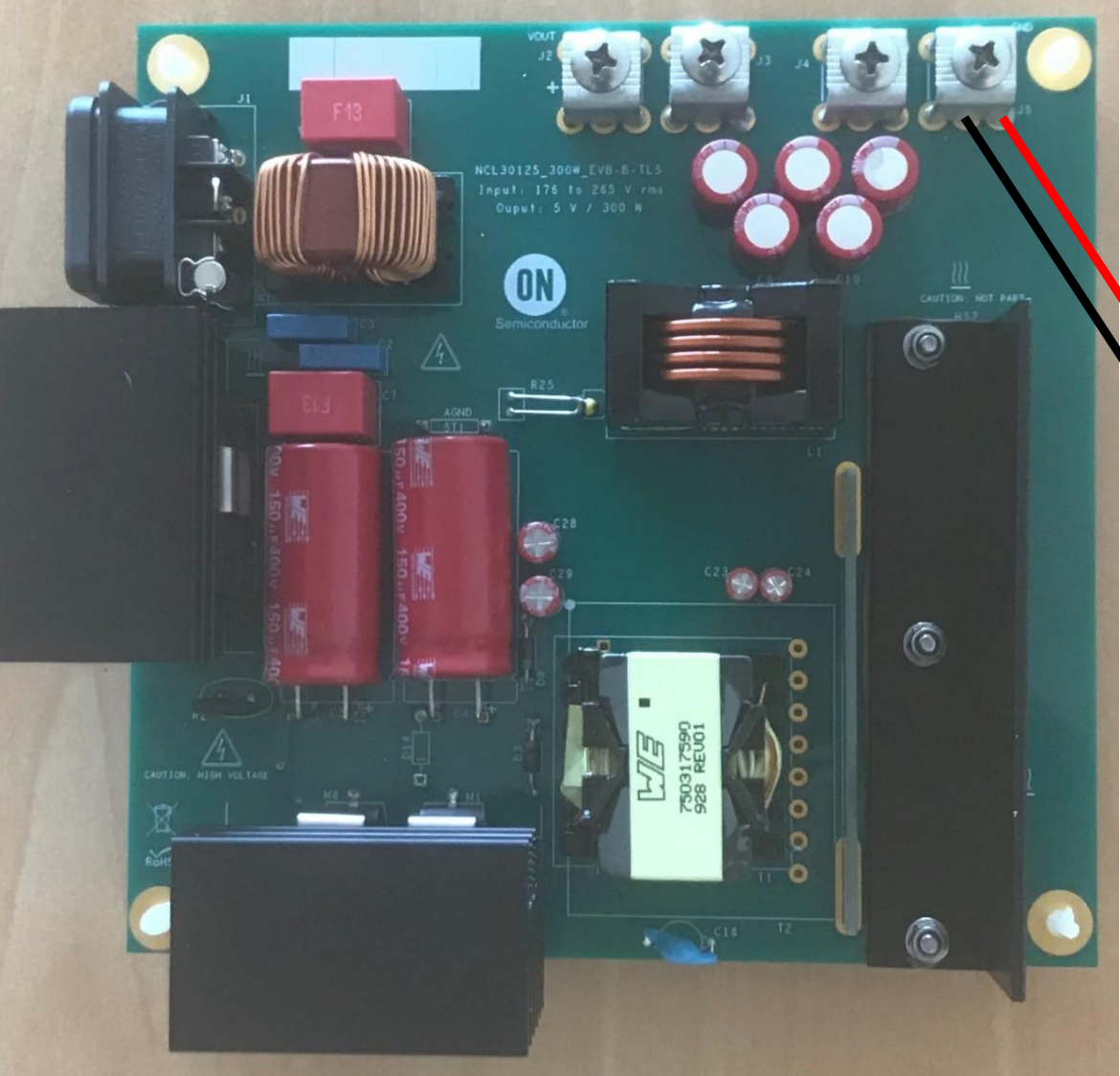


# Connecting the Board for Testing

Watt-meter  
Input power



Ac source  
176 to 265 V rms



Power  
Cable

Kelvin  
Sense



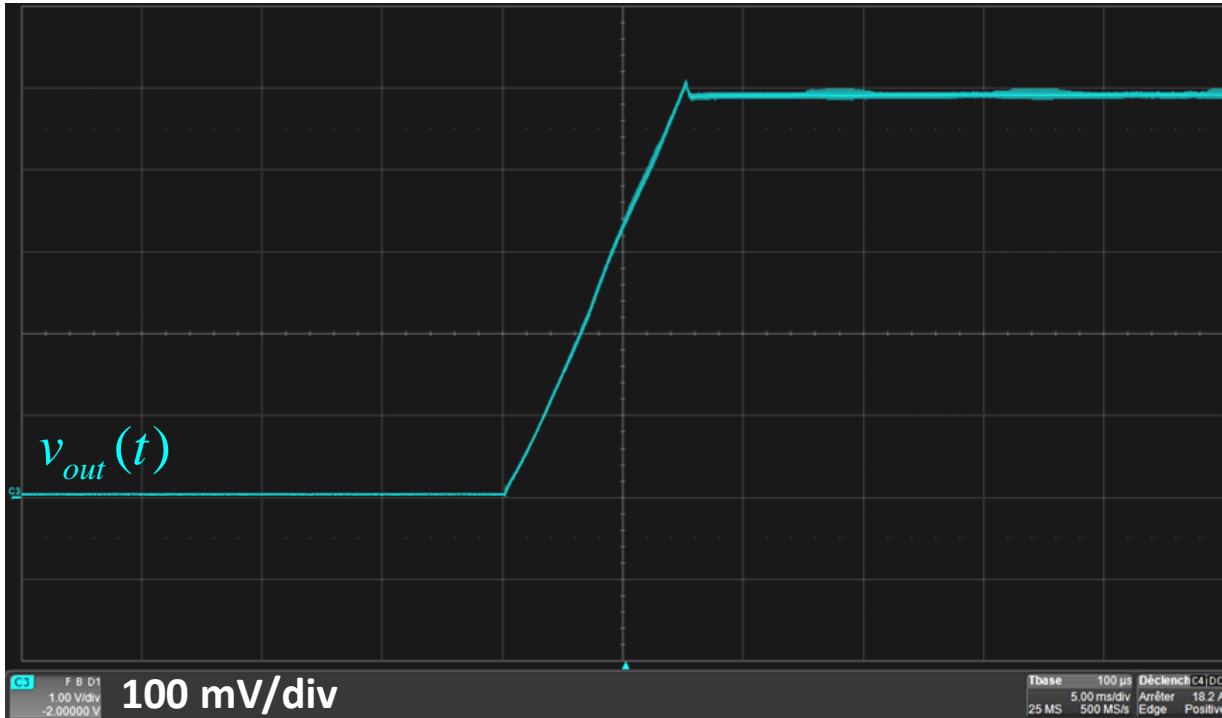
Electronic load  
in CC mode



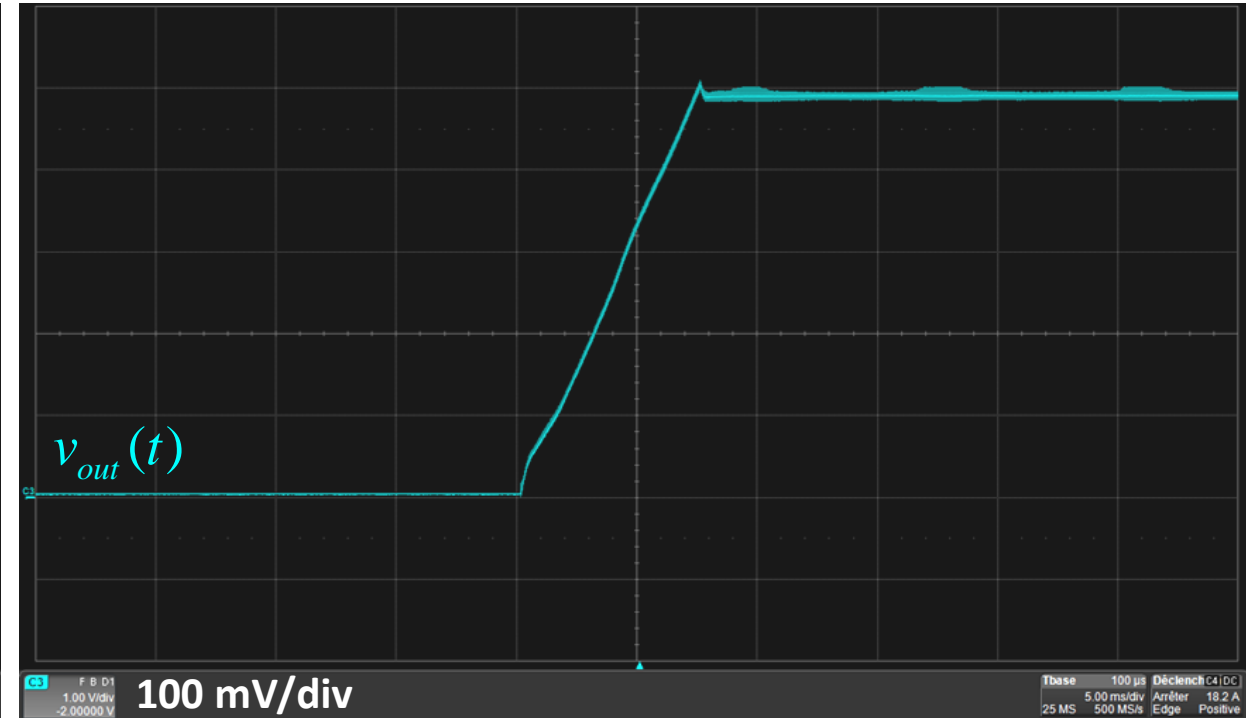
# Test n° 1: Full Load Start-up

- Connect electronic load in **CR mode** to J2 connector
- Load is set to absorb 60-A current ( $\approx 80 \text{ m}\Omega$ )
  
- Apply the input voltage 176 V rms to input connector
  - ✓ *Check that output voltage is around 5 V*
  - ✓ *Verify that input power is below 340 W*
  
- Repeat test for  $V_{\text{in}} = 230 \text{ V rms}$  and  $265 \text{ V rms}$

# Test n° 1: Full Load Start-up



$V_{in} = 176 \text{ V rms} - 60 \text{ A in CR mode}$



$V_{in} = 265 \text{ V rms} - 60 \text{ A in CR mode}$

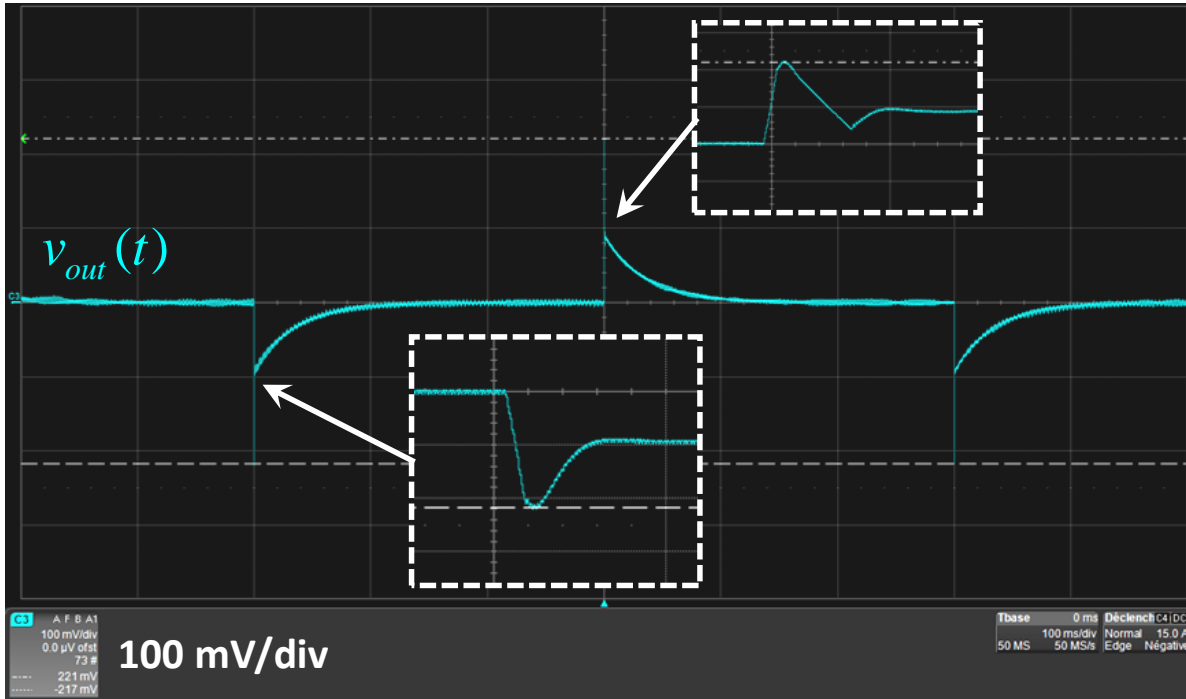
- It is important to verify the absence of double slope or negative slope.
- Removed the load and repeat the test. Wait 10 s between re-starts.

## Test n° 2: Transient Load

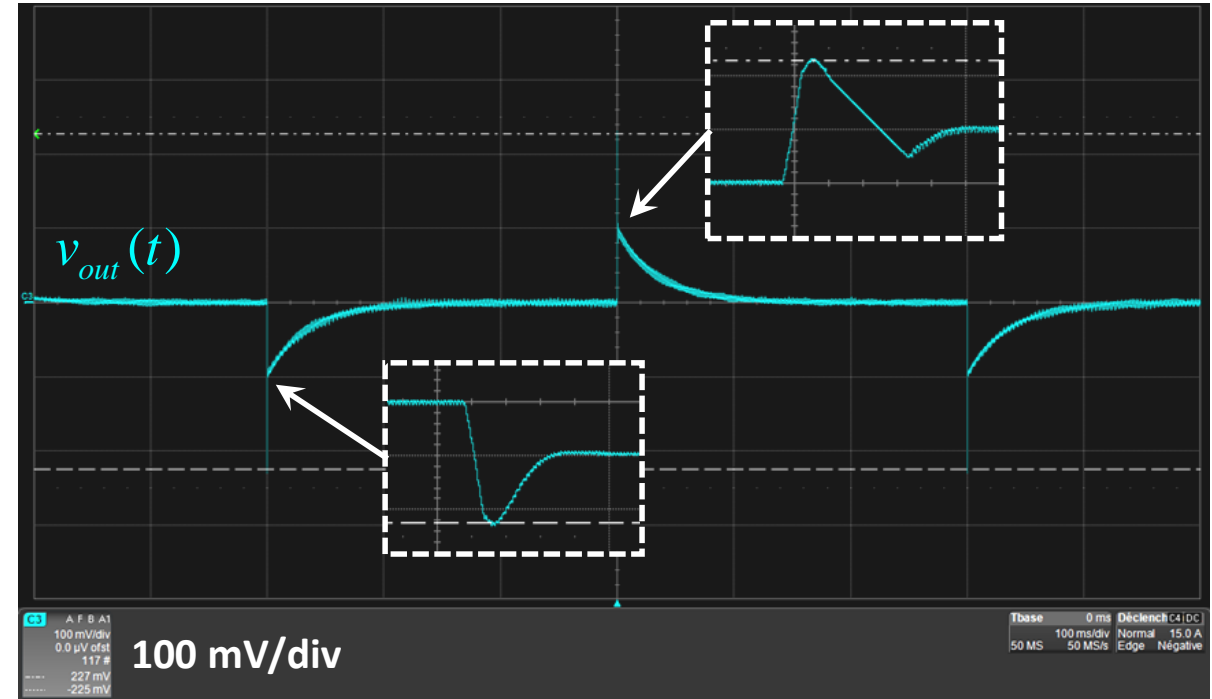
- Connect electronic load in dynamic CC mode to J2 connector
- $I_{out}$  from 6 A to 60 A, slope 1 A/ $\mu$ s, 50% duty ratio, 600-ms period
- Connect the *oscilloscope in ac, 100 mV/div*
  
- Apply the input voltage 176 V rms to J1 connector
  - ✓ *No oscillation should be visible*
  
- Apply the input voltage to 265 V rms



# Test n° 2: Transient Load



$V_{in} = 176 \text{ V rms} - 6 \text{ to } 60 \text{ A} - 1 \text{ A}/\mu\text{s}$



$V_{in} = 265 \text{ V rms} - 6 \text{ to } 60 \text{ A} - 1 \text{ A}/\mu\text{s}$

➤ Spec is to have an under/over shoot less than 250 mV

# Test n°3

- Connect electronic load in **CR mode** to J2 connector
- Load is set to absorb 60-A current ( $\approx 80 \text{ m}\Omega$ )
  
- Apply the input voltage 176 V rms to input connector
- Leave the board 10 min in this condition
  
- Check no thermal tripping occurs