



New inverter for the wire-scanner intelligent drive

Beam wire scanner meeting - 19.05.2016

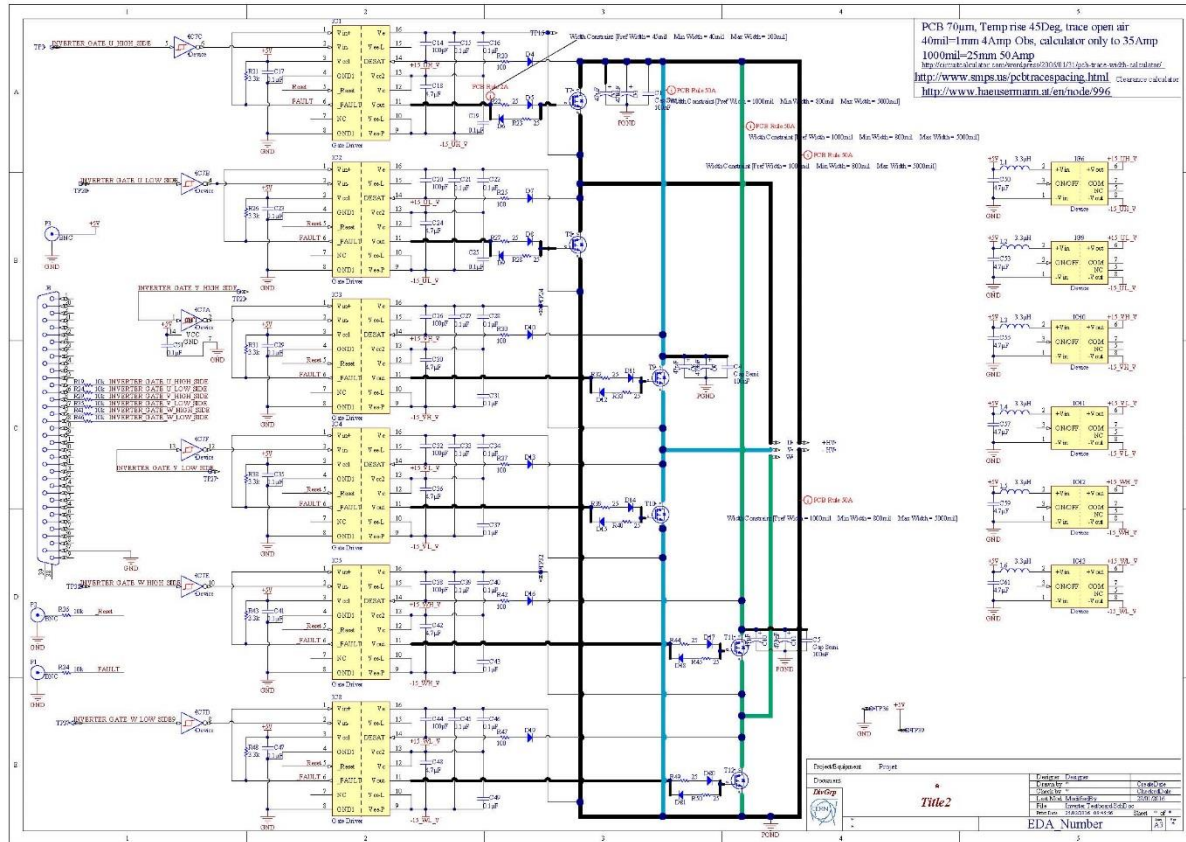
J. Emery & P. Andersson



Introduction

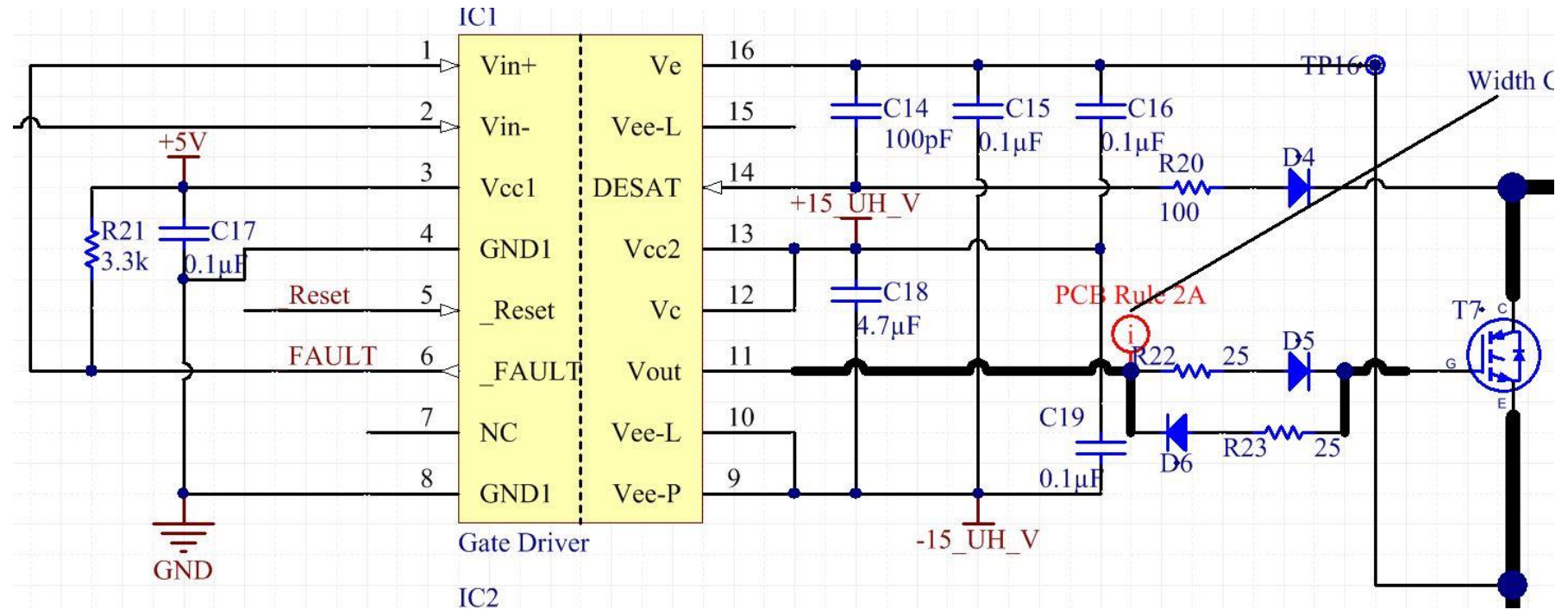
- Context of this presentation:
of the new Inverter.
- Goals of this presentation:
 - 1) Go through the Design.
 - 2) Measurement
 - 3) Finally concecpt.

Design Inverter



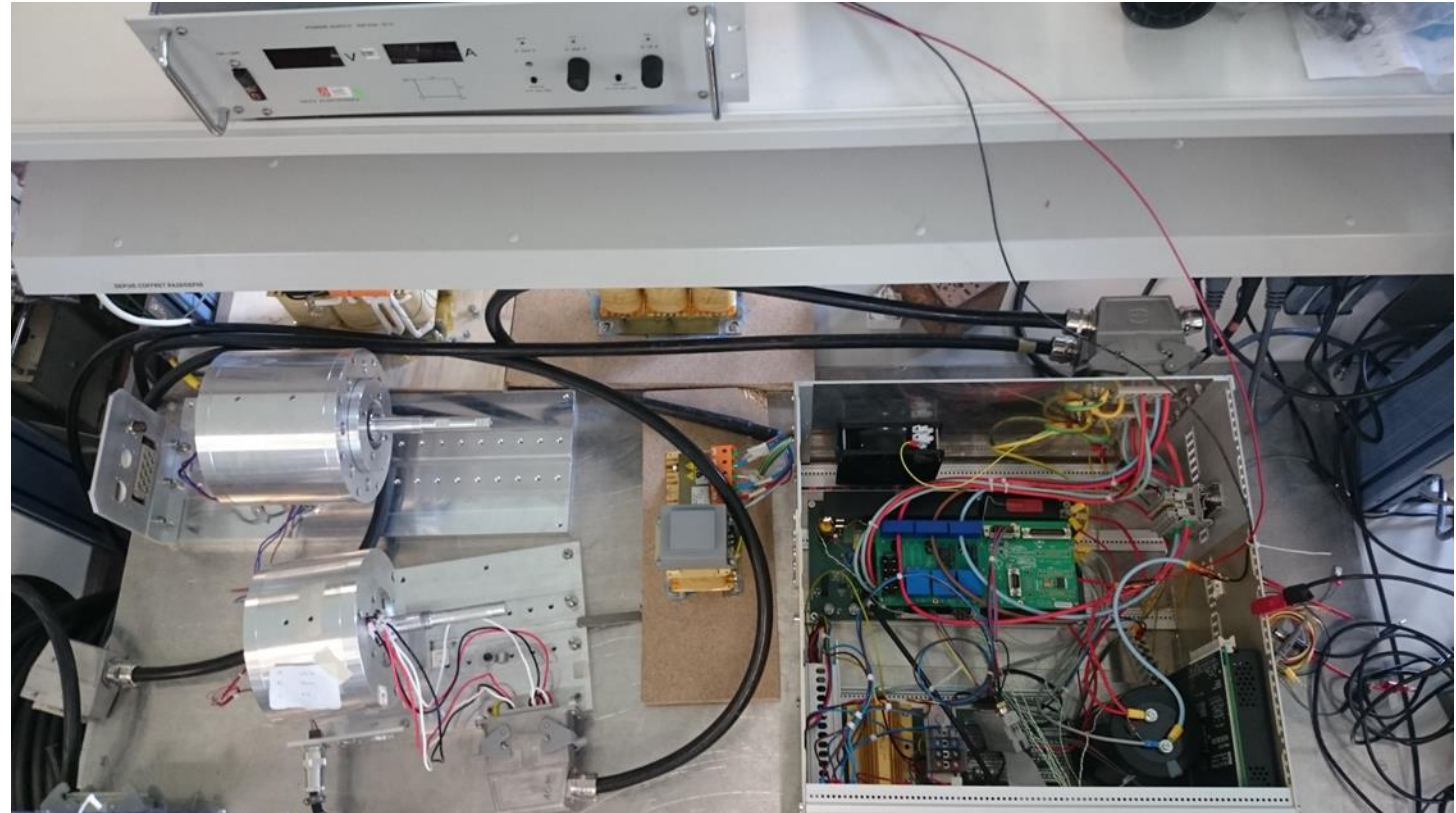
- IGBT IRG4063
 - $V_{CES} = 600V$, $I_C = 60A$ (200A peak), $T_c = 100\text{ }^\circ\text{C}$, $T_j = 175\text{ }^\circ\text{C}$
- For the gate driver a ISO5500 is used.
 - 2.5A peak Output current
 - $I_c = 150A$, $V_{CE} = 600\text{ V}$
 - Soft IGBT Turnoff.
 - Integrated Fail-safe IGBT protection
 - High V_{ce} (DESAT) Detection. (Overcurrent protection)
 - Undervoltage Lockout(ULVO). (sufficient driver voltage)
 - User Configurable Functions
 - Inverting, noninverting Inputs.
 - Auto-Reset
 - Auto-Shutdown.
- 6 DC/DC for the gate driver.
 - 3W.

One Output

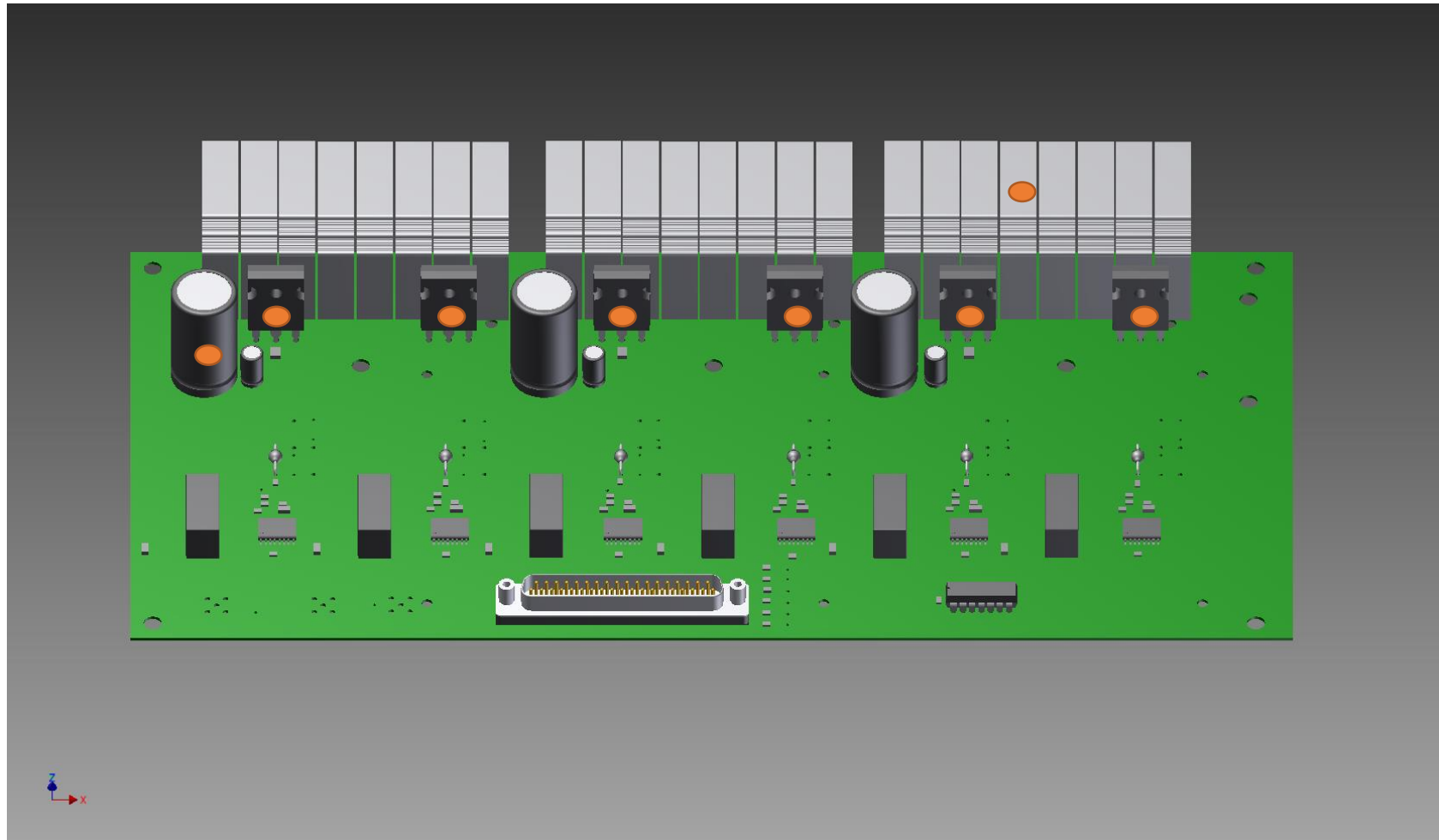


Test set up

- Electronic
 - 1) New Inverter.
 - 2) Measurement Board.
 - 3) External power supply with Capacitor bank.
300Vdc. 10A(limit).
 - 4) Filter.
- Controller
 - 1) Dspace.
- Motor
 - 1) Parker motor. Same as SPS
 - 2) 10m Cable.
- Labview for temp.meas.
 - 1) Thermocouple Type K.



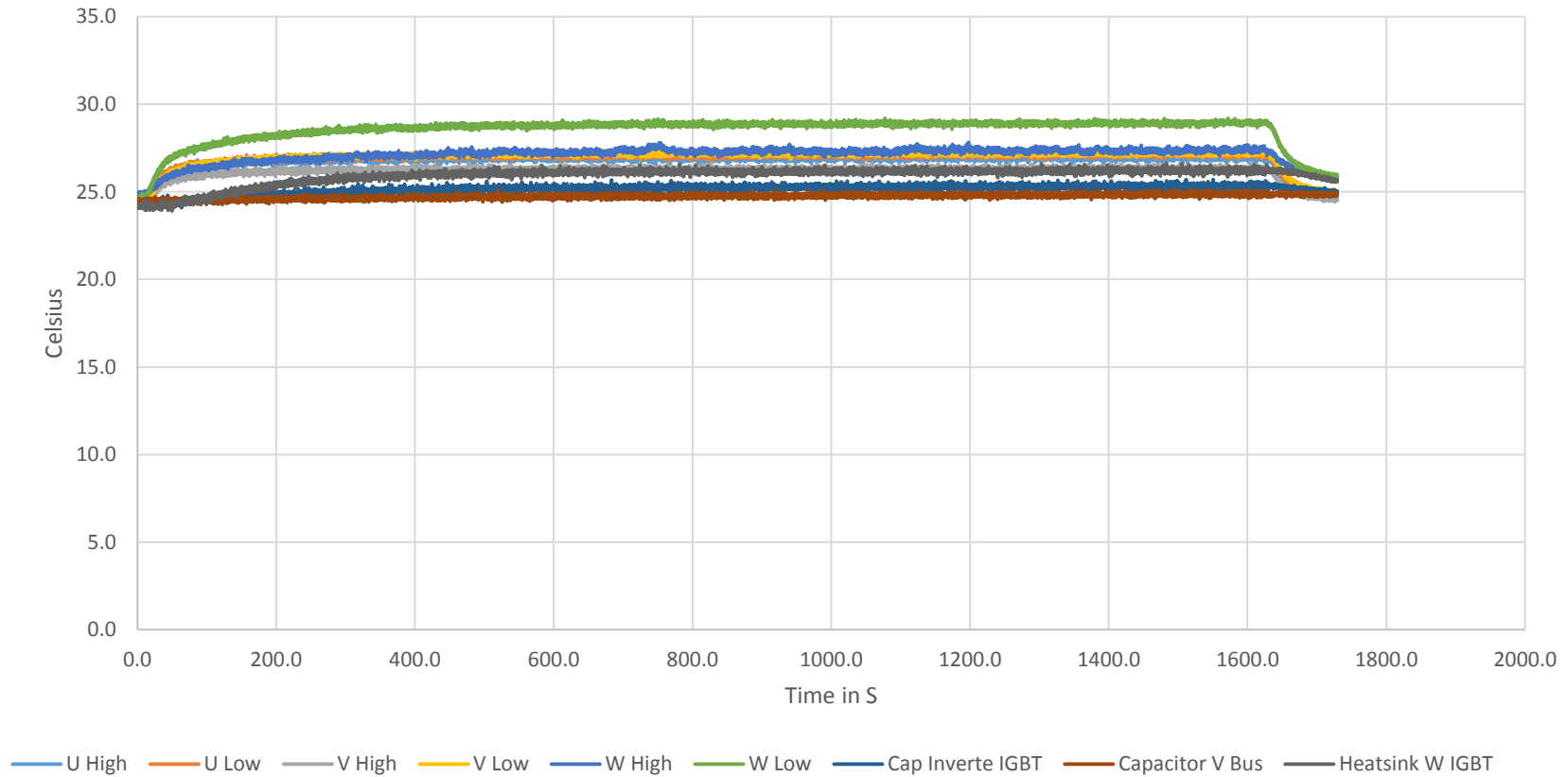
PCB Temperature measure point's





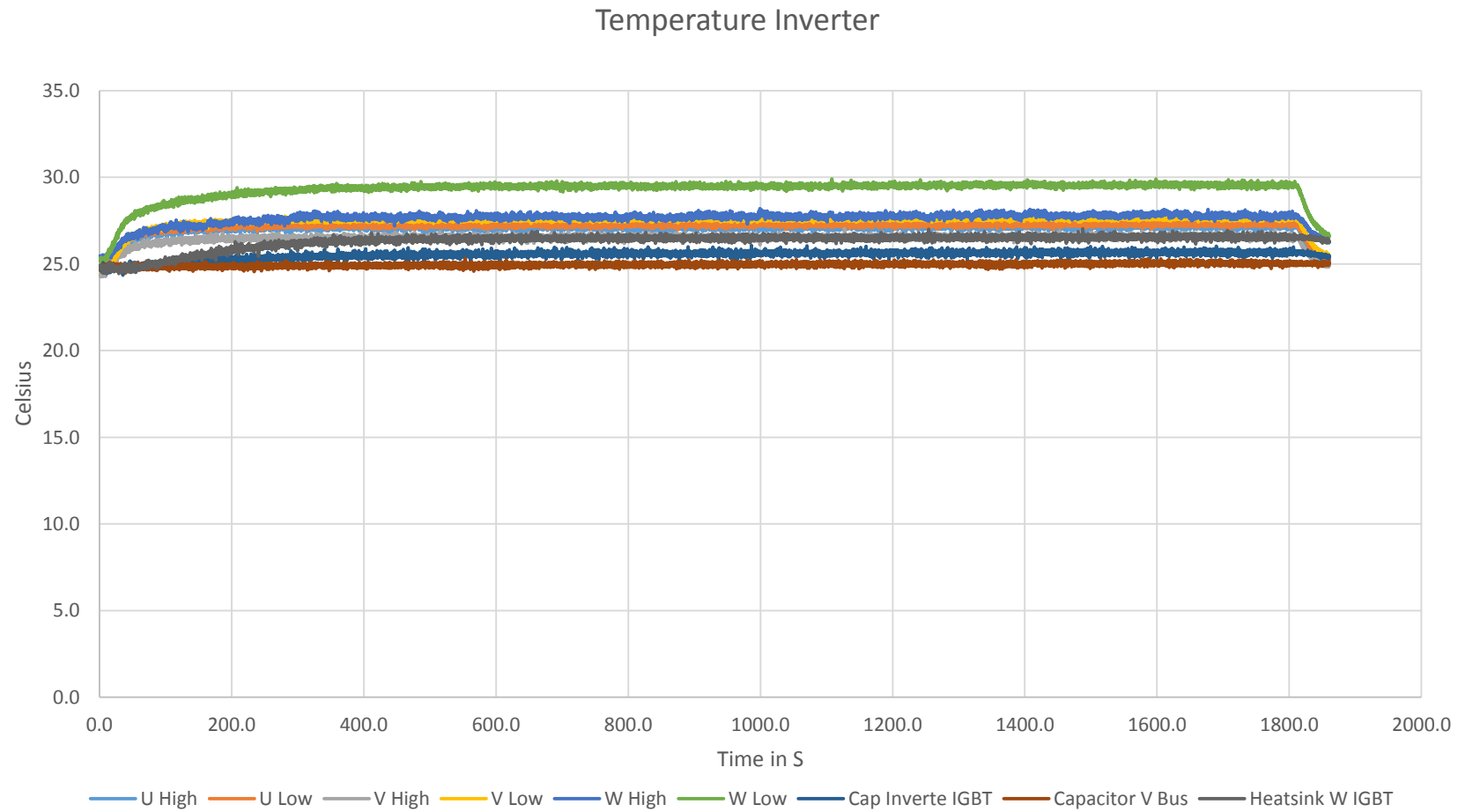
Speed Motor 110Rad/s, Scan 1/s

Temperature Inverter



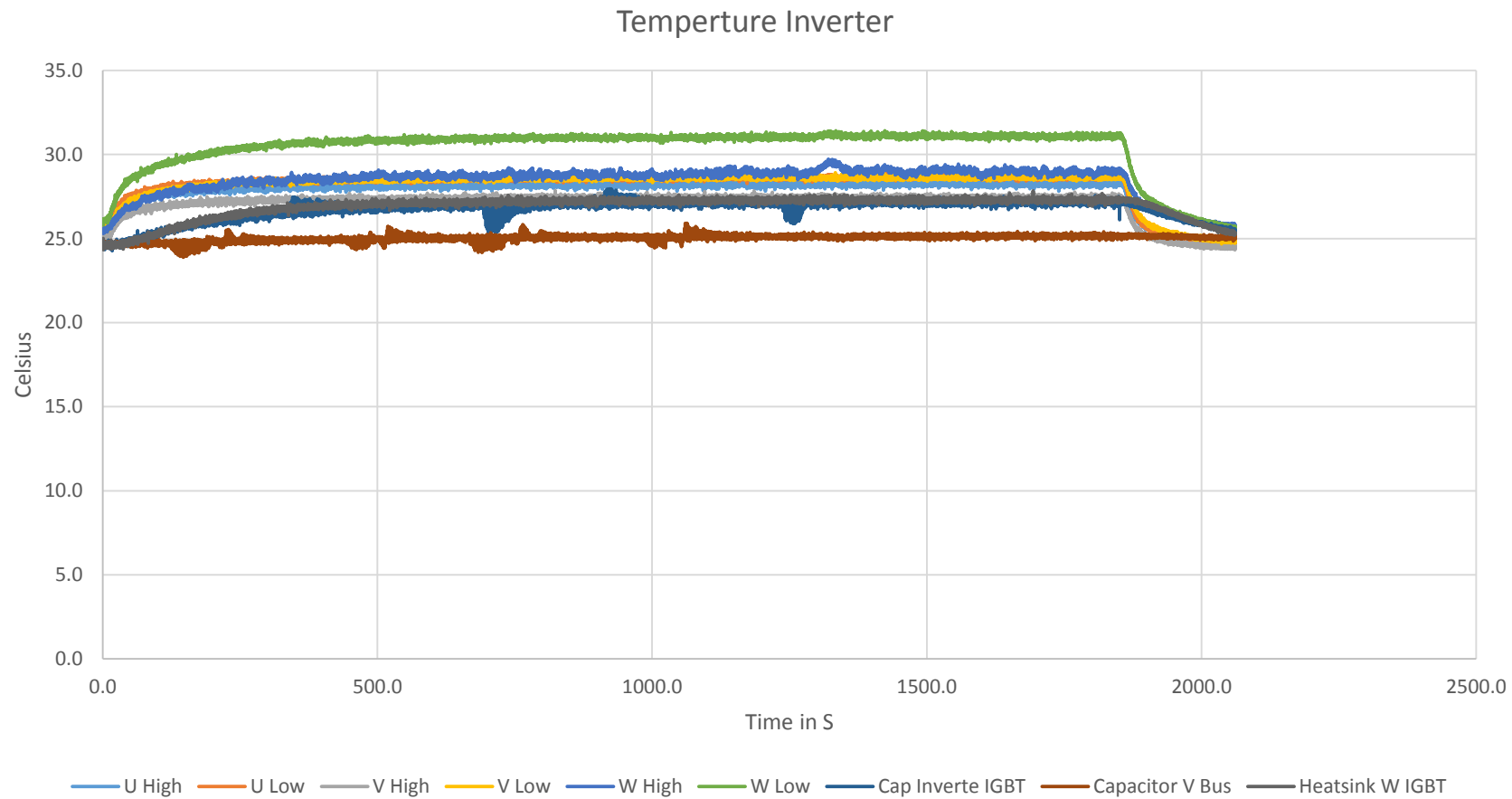


Speed Motor 140Rad/s, Scan 1/s





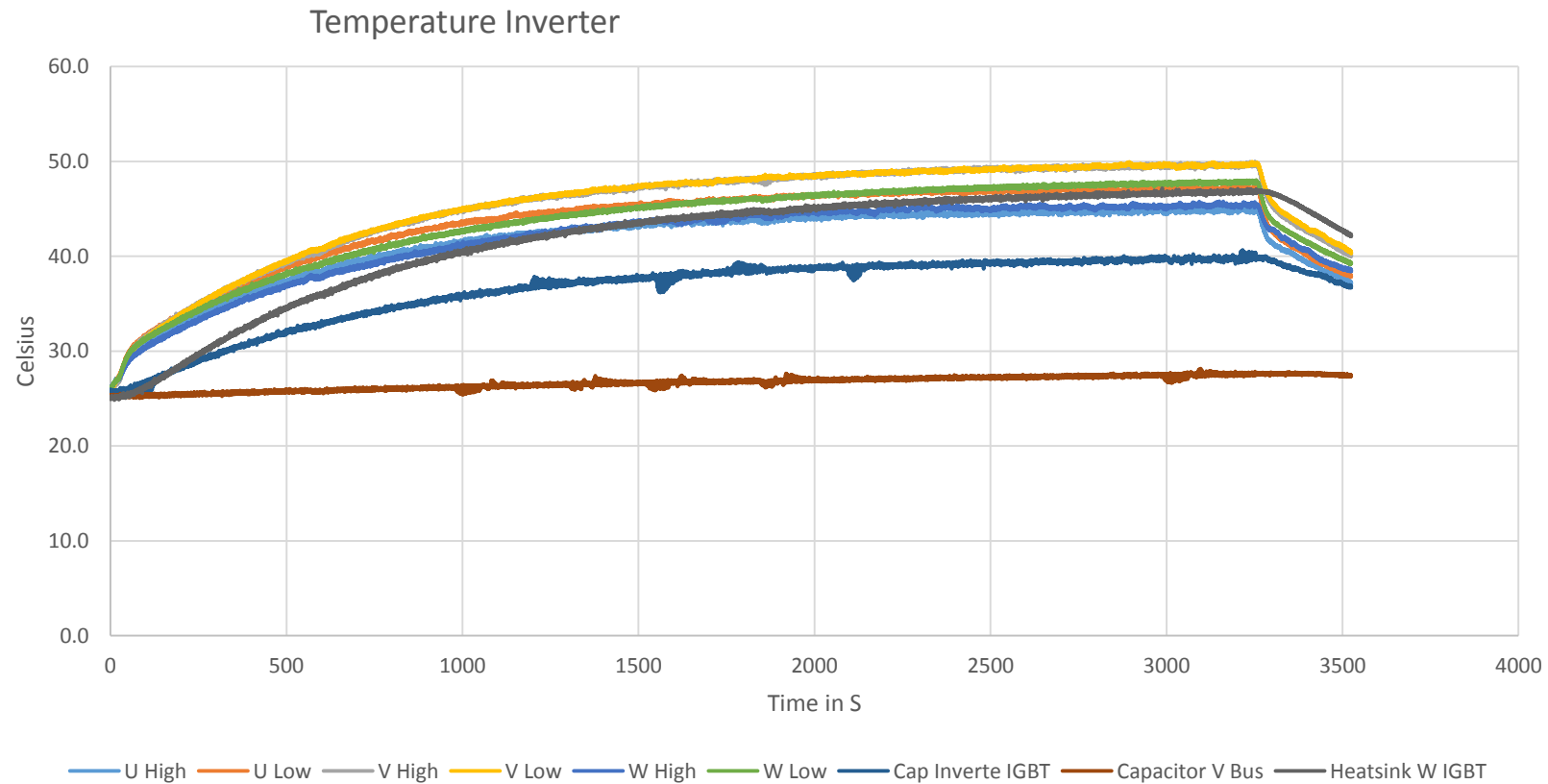
Speed Motor 200Rad/s, Scan 1/s





Speed Motor 200Rad/s, Scan 1/s

No active cooling





Dspace Measurement





Next step Inverter

- Measure V_{ce} and Gate current on the IGBT
- Update the inverter PCB with voltage and current measurement to reduce number of cards in the intelligent driver unit.
- Do a test with the right power supply for V bus.

Concept 6U

