orca semi

OS1000 Competive Advantages

V1.0

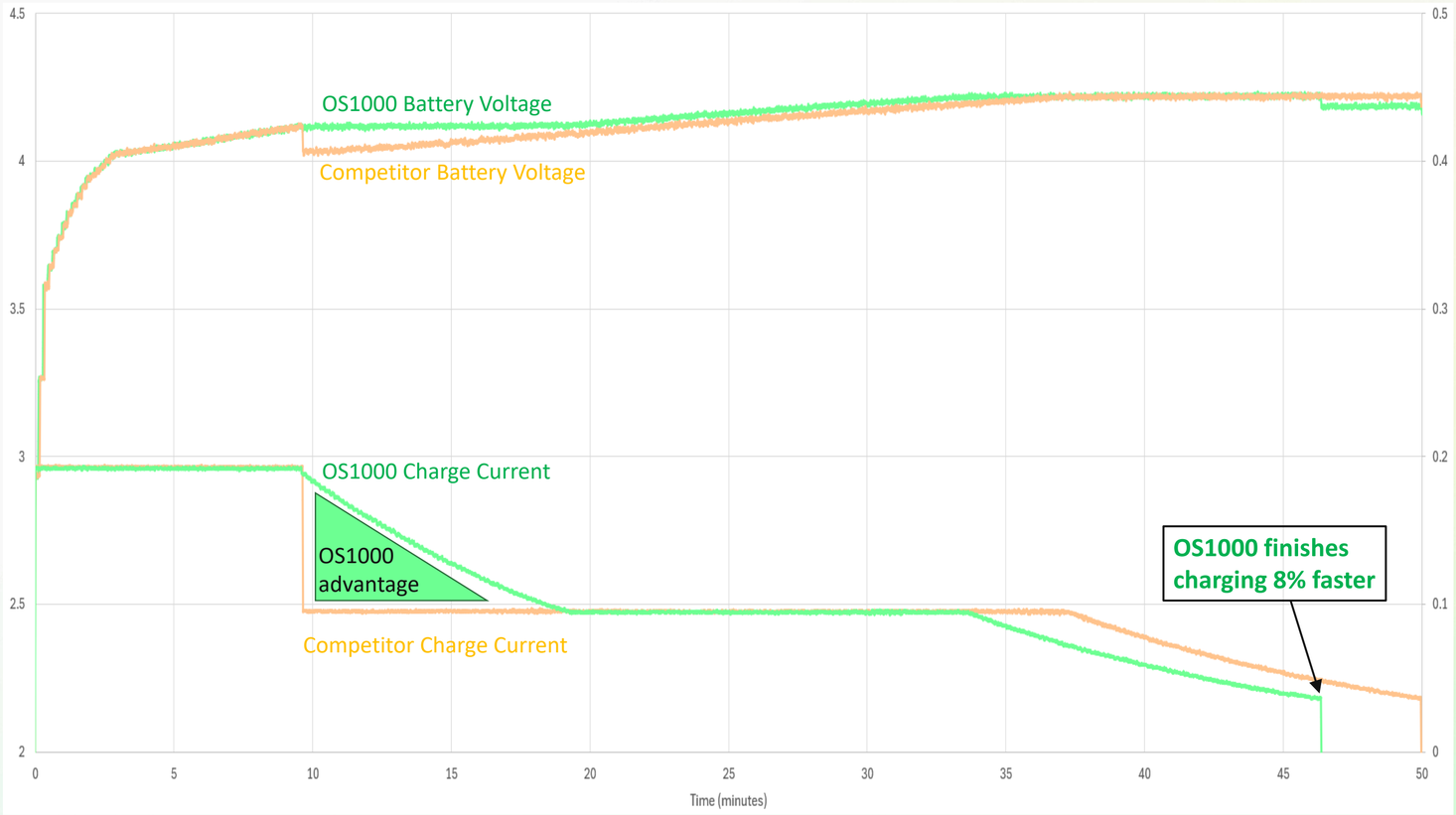
Nov 8, 2024

OS1000 Li+ Charger Advantages

- **Improved setting of constant voltage target.**
  - To maximize the state of charge in a Li+ battery it is required to get as close to the maximum voltage allowed by the manufacturer without exceeding.
  - OS1000 constant voltage (V_{BATREG}) is accurate to ±0.6V over temperature and ±0.3% at 25°C (common among high performance charger solutions)
  - OS1000 outperforms the competition with the ability to set the voltage with a very small step size (≈5mV) (vs 10mV or higher in competitive parts)
- **Ability to set JEITA temperatures independent of thermistor value and type**
  - OS1000 has fully adjustable temperature thresholds set by OTP memory to fine tune the temperatures to precisely match the battery manufacturers specifications.
- **Faster charging when using Step Charging (up to 8% faster)**
  - Step charging preserves the lifetime of a battery by allowing high current charging only when the battery terminal voltage is below a safe threshold.
  - OS1000 smoothly reduces charging current at the step charge threshold instead of an abrupt change in other charging solutions. The smooth transition maximizes the power put into the battery.

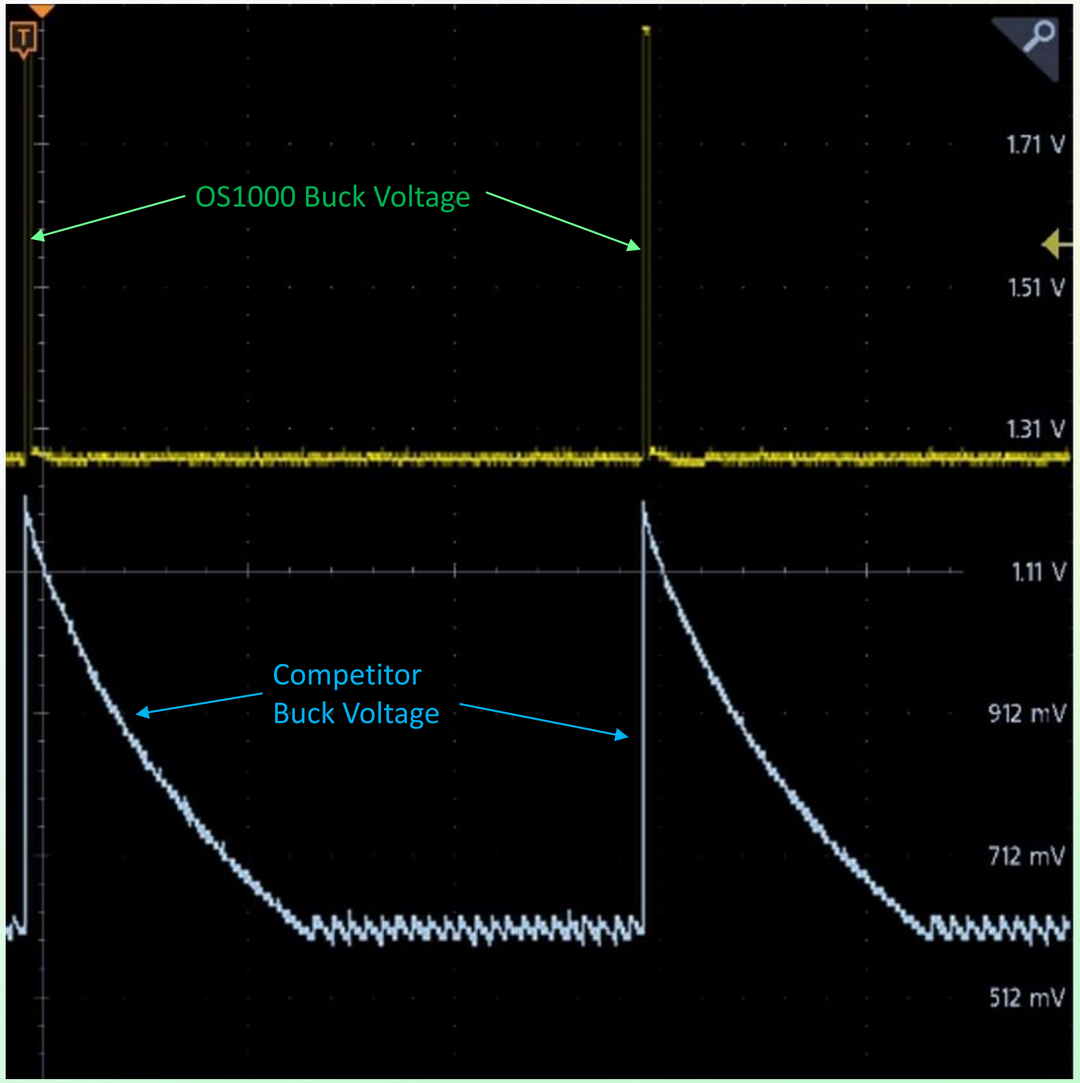
OS1000 Li+ Charger Advantages

- **OS1000 vs competition with Step Charging**
  - OS1000 smoothly reduces charging current while holding the battery voltage constant at the end of step charging
  - Competitor abruptly drops charging current at the end of step charging.
- OS1000 finishes charging 8% faster
  - More energy is put into the battery below the step charge voltage limit resulting in faster charging.



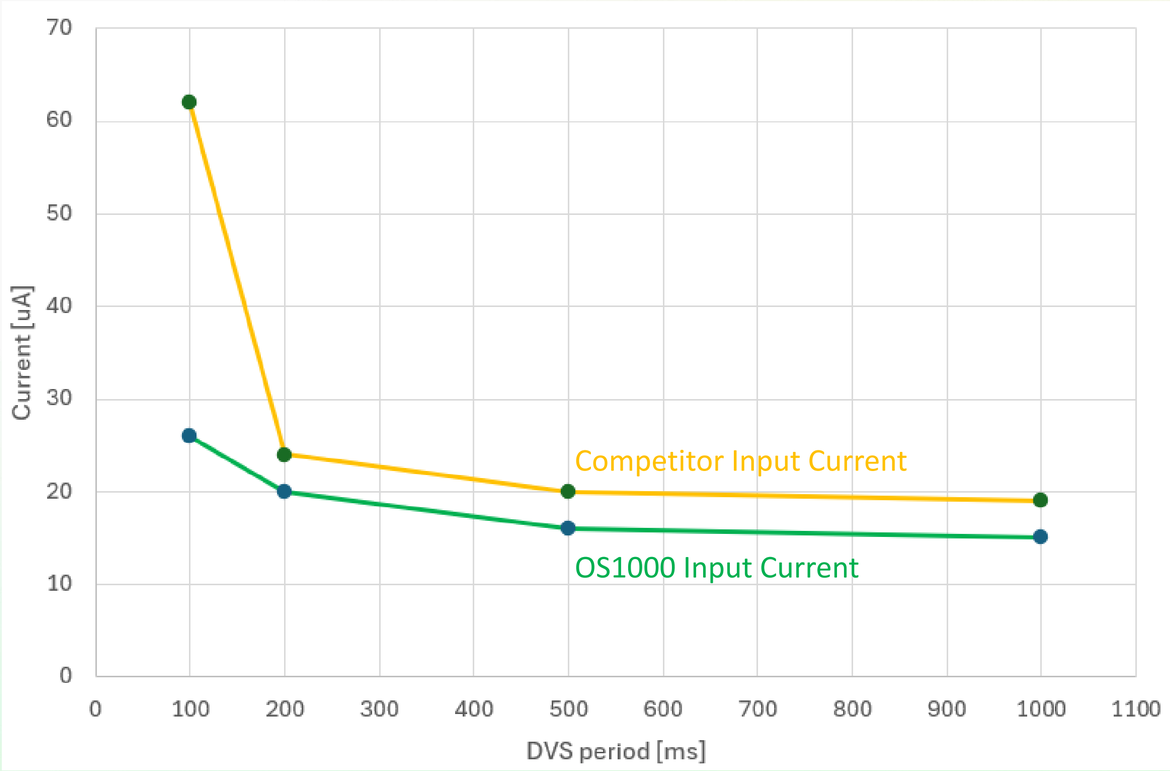
OS1000 Buck Converter Advantages

- **High Efficiency in Dynamic Voltage Scaling**
  - Modern microcontrollers use DVS to save power. In idle or low power states, the core voltage is reduced dropping leakage current.
  - Competitor DVS solutions can not actively reduce the output voltage. Instead, they let the load current discharge the output capacitor This is wasted energy
- **OS1000 can recycle the energy in the output capacitor back to the input.**
  - OS1000 will recycle the energy in the output capacitor driving the output voltage to the requested value due to a DVS request.
  - OS1000 rise and fall times are controlled and fast allowing the microcontroller to transition modes quickly



OS1000 Buck DVS Power Savings vs Competition

- **Operation Assumptions**
  - Voltages: Normal Mode 1.2V, Idle Mode 0.6V
  - Currents: Normal Mode 120uA, Idle Mode 60uA
  - Duty Cycle: Microcontroller is in normal mode 1% and in idle mode 99% of the time
- **Power Savings Example.**
  - X Axis: DVS period. Defines the period for enter/exit DVS. Example DVS period=100ms. Microcontroller in in normal mode 1% of 100 = 1ms and in Idle mode 99% of 100ms = 99ms
  - Y Axis. This is the average current drawn from the battery (input current to the buck averaged over the DVS period)
  - For DVS Period 100ms. OS1000 is 58% less current
  - For DVS Periods ≥ 200ms, OS1000 is 16% less current



orca semi

Thank you