

Datasheet description:

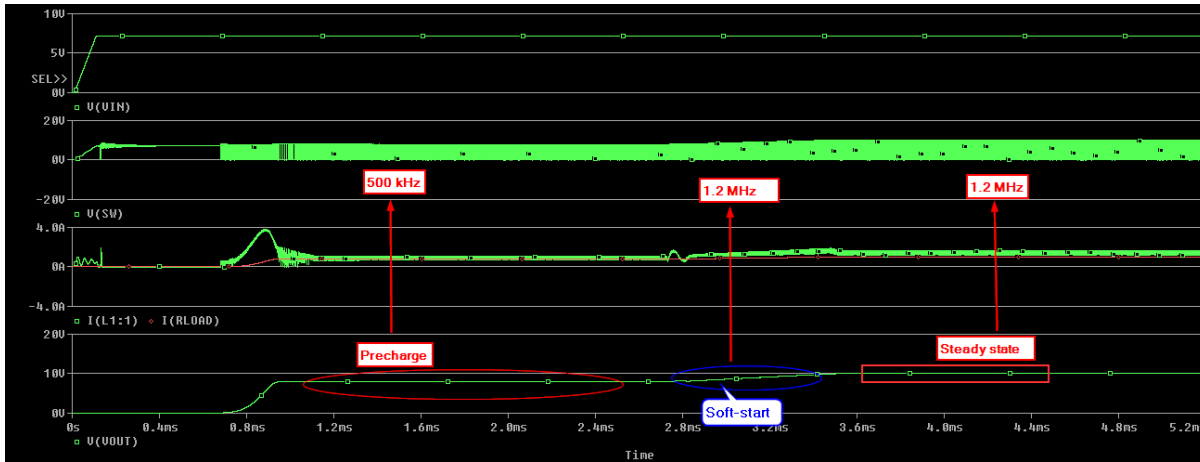
8.3.3 Startup

When the input voltage to the device exceeds the UVLO threshold and EN pin pulled to high as well, the TPS61178x starts to ramp up the output voltage. There is a switching pre-charge phase and the output voltage is charged up to 10% higher than the input voltage ($1.1 \times V_{IN}$). The switching frequency is a fixed 500 kHz at the pre-charge phase.

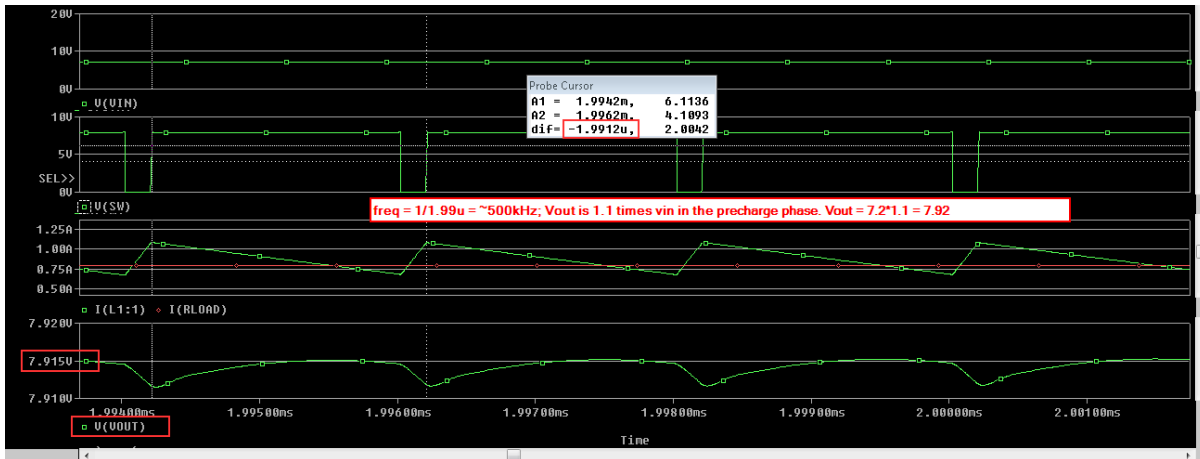
After the pre-charge phase ends (typical 2.6 ms), The TPS61178x regulates the FB pin to the internal soft start voltage and results in a gradual rise of the output voltage starting from the input voltage level to the target output voltage. The soft start time is typical 3.2 ms, which helps the regulator to gradually reach the steady state setting point, thus reducing the startup stresses and surges. The switching frequency follows the oscillator setting by the resistor connecting with the FREQ / SYNC pin.

If the device is synchronized by the external clock, the switching frequency is fixed 500 kHz at the soft start phase and changes to the external clock when the soft start phase ends.

Complete Startup ($v_{in} = 7.2$, $v_{out} = 10V$, $i_{out} = 1A$, set freq = 1.2MHz)



Precharge stage, $v_{in} = 7.2$, $v_{out} = 10V$, $i_{out} = 1A$, set freq = 1.2MHz but precharge freq is 500k



Steady state $v_{in} = 7.2$, $v_{out} = 10V$, $i_{out} = 1A$, freq = 1.2MHz

