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NCP1521B Adjustable Output Voltage Step-Down Converter Simulation Procedure



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Prepared by: Bertrand Renaud
On Semiconductor

SIMULATION NOTE

Overview

The NCP1521B step-down PWM DC-DC converter is optimized for portable applications powered from one cell Li-ion or three cell Alkaline/NiCd/NiMH batteries.

The part is available in adjustable output voltage versions ranging from 0.9 V to 3.3 V. It uses synchronous rectification to increase efficiency and reduce external part count. The device also has a built-in 1.5 MHz (nominal) oscillator which reduces component size by allowing smaller inductors and capacitors. Automatic switching PWM/PFM mode offers improved system efficiency.

Additional features include integrated soft-start, cycle-by-cycle current limiting and thermal shutdown protection. The NCP1521B is available in space saving, low profile TSOP5 and UDFN6 packages.

Model Package

NCP1521B model has been developed on ORCAD Capture & Pspice 15.7. It includes NCP1521B typical application schematic (NCP1521B.DSN), NCP1521B simulation library (NCP1521B.LIB) and NCP1521B package (NCP1521B.OLB).

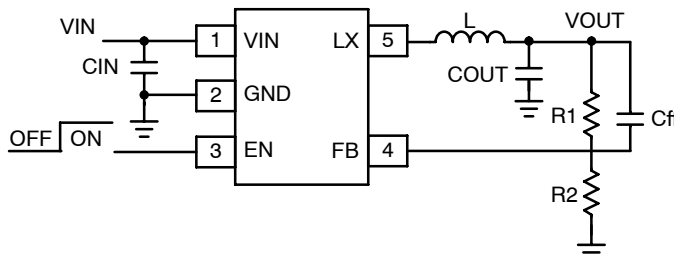


Figure 1. Typical Application - TSOP-5

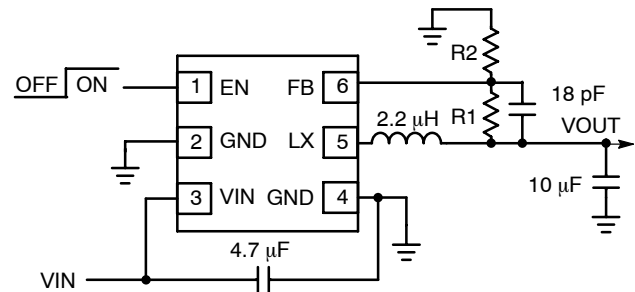
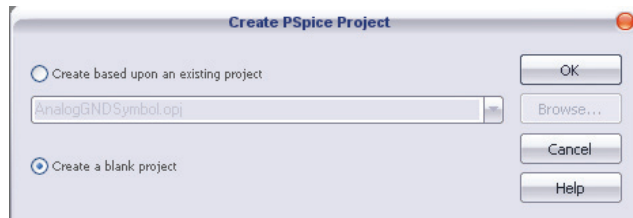
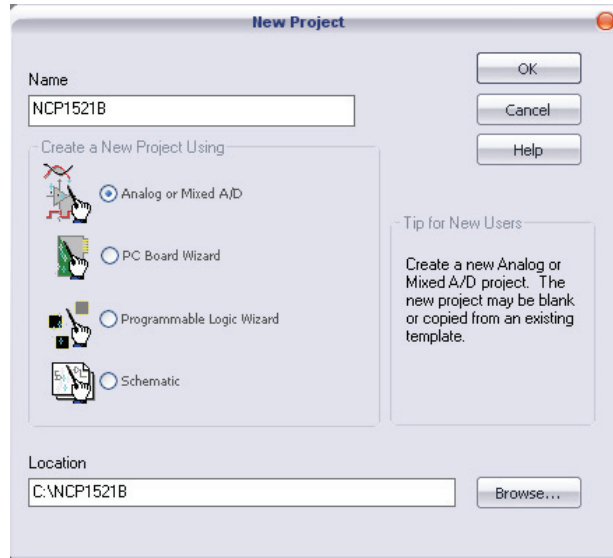


Figure 2. Typical Application - UDFN6

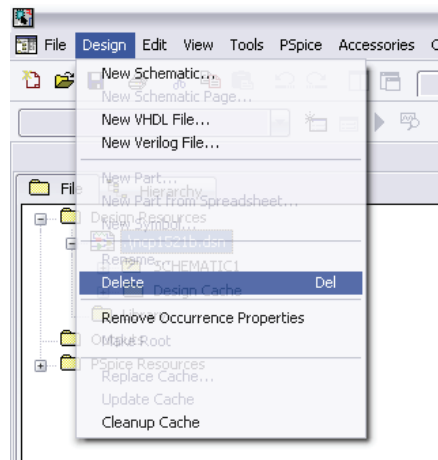
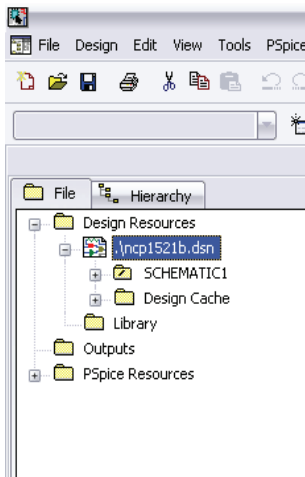
Model Installation

This procedure describes one method to correctly simulate this model.

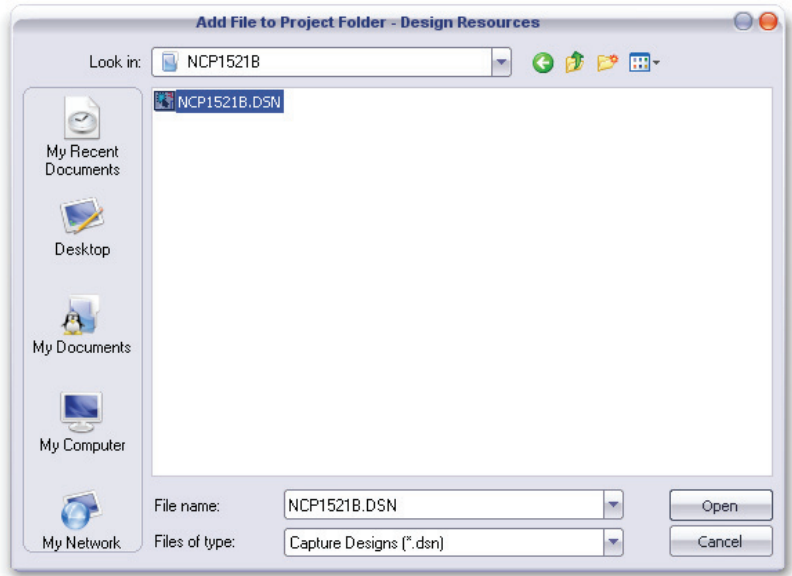
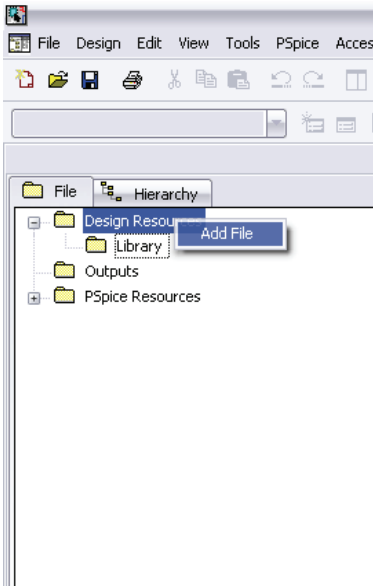
1. Run ORCAD Capture and start a new blank project development.



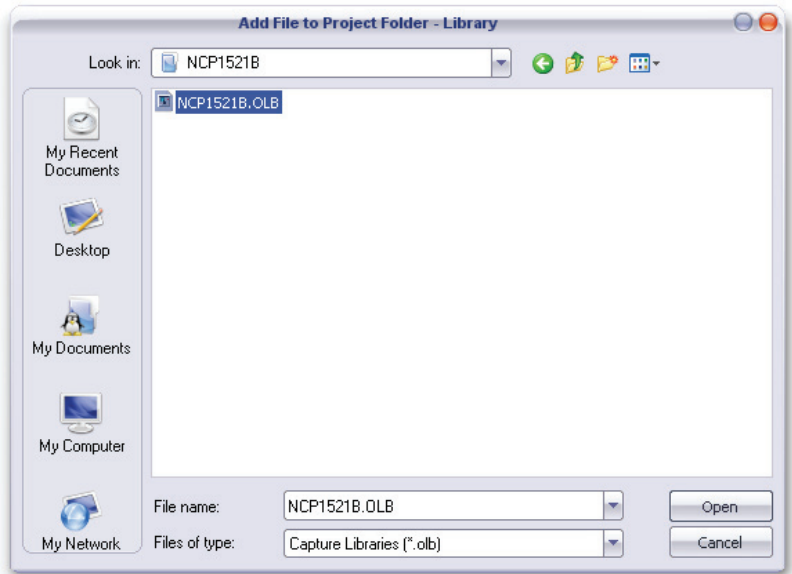
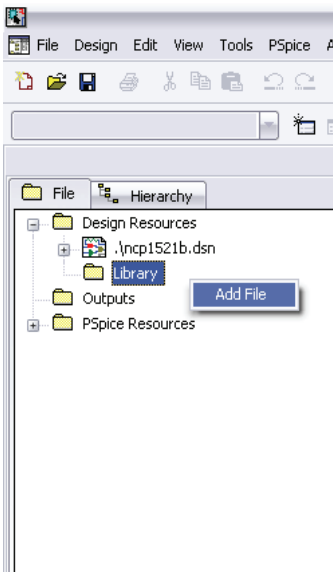
2. Delete the current blank design



3. Import NCP1521.DSN schematic

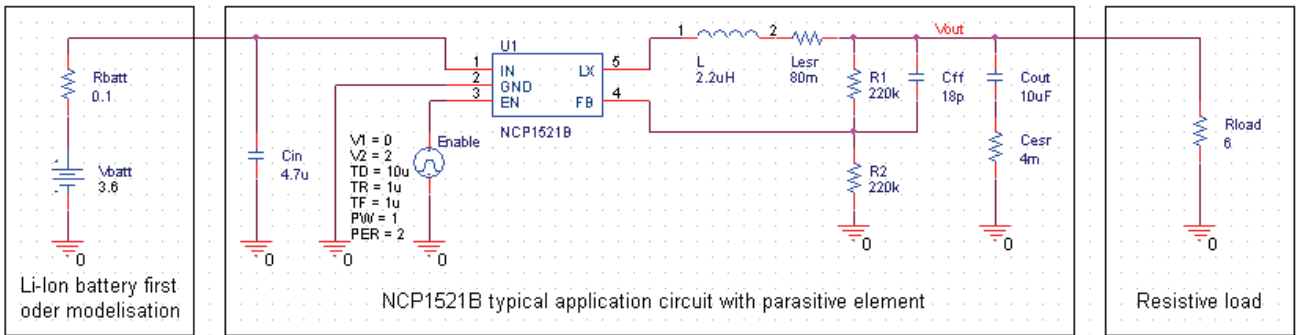
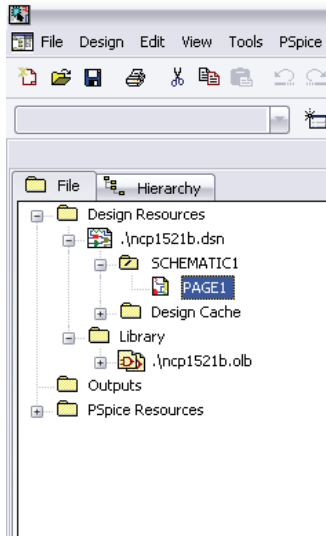


4. Import NCP1521B.OLB package too



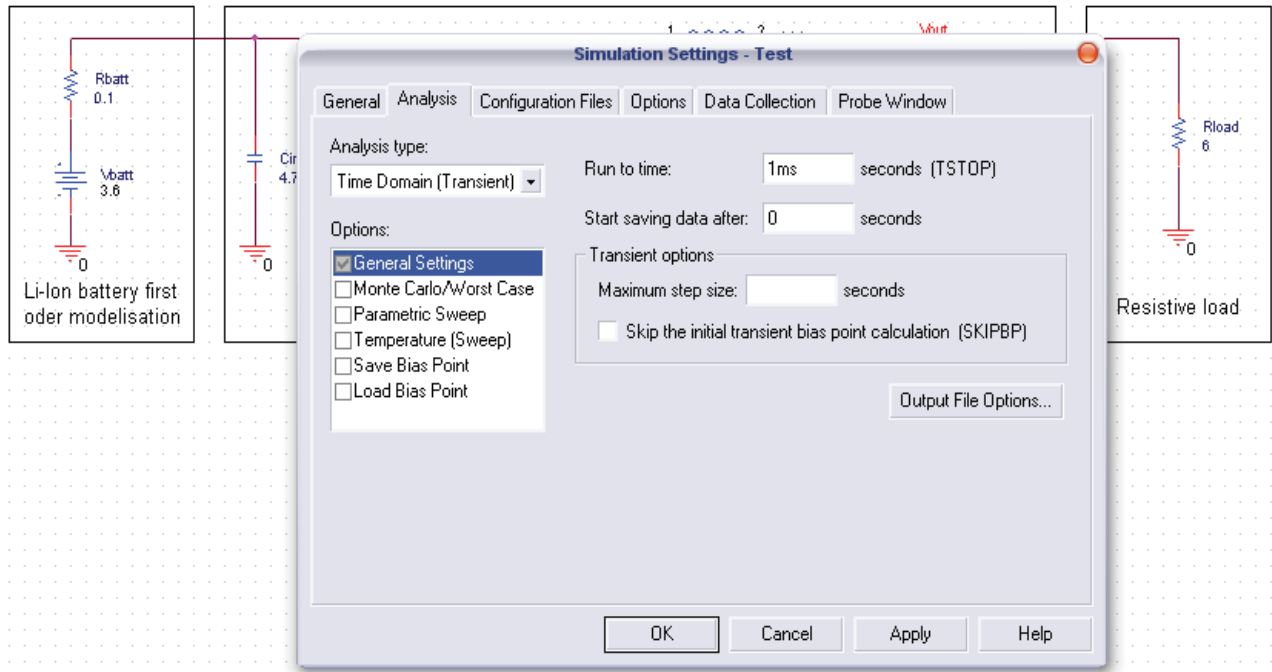
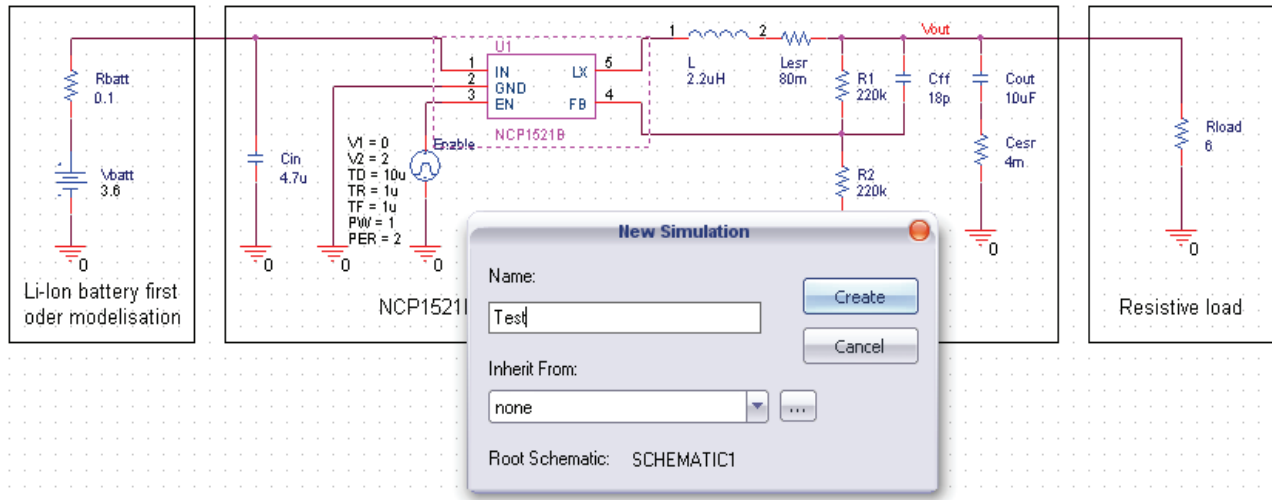
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5. Your hierarchical project looks like the following pictures



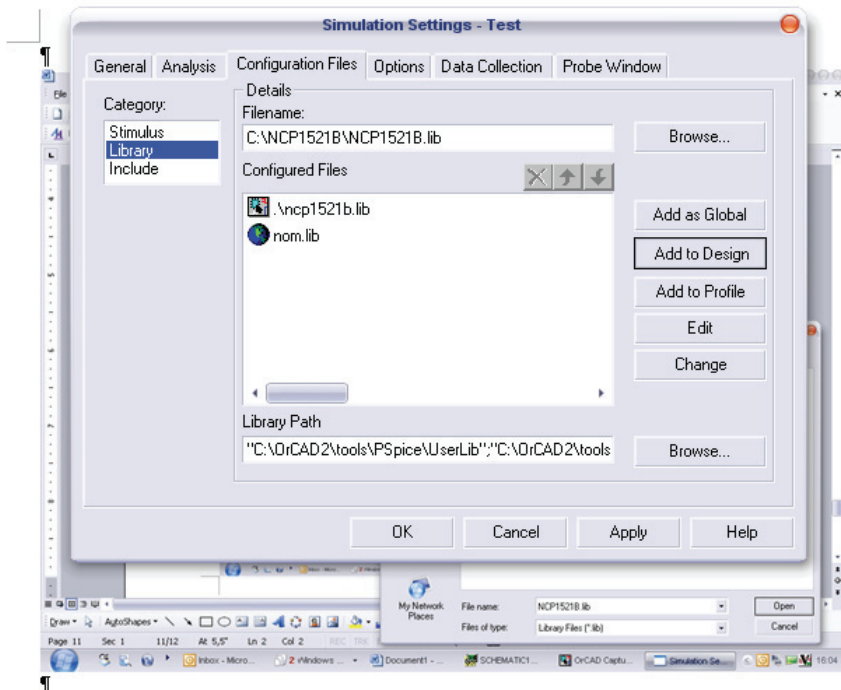
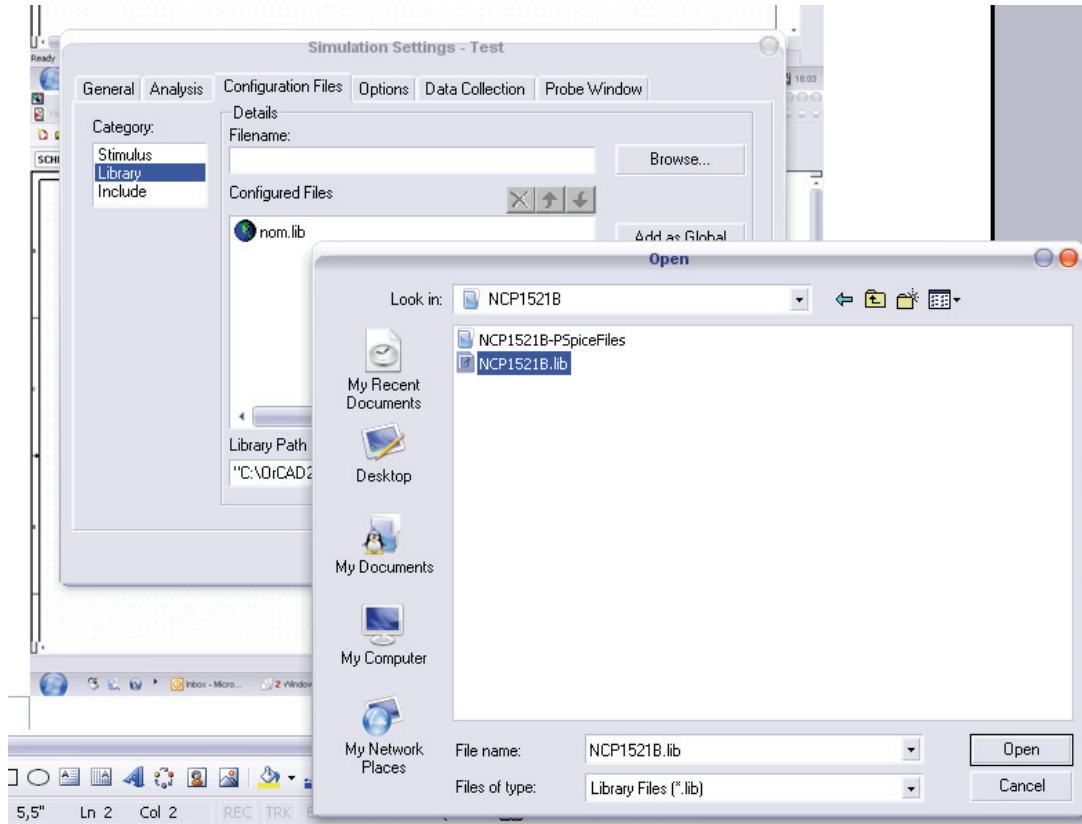
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6. To simulate the device, a new time domain simulation must be created:



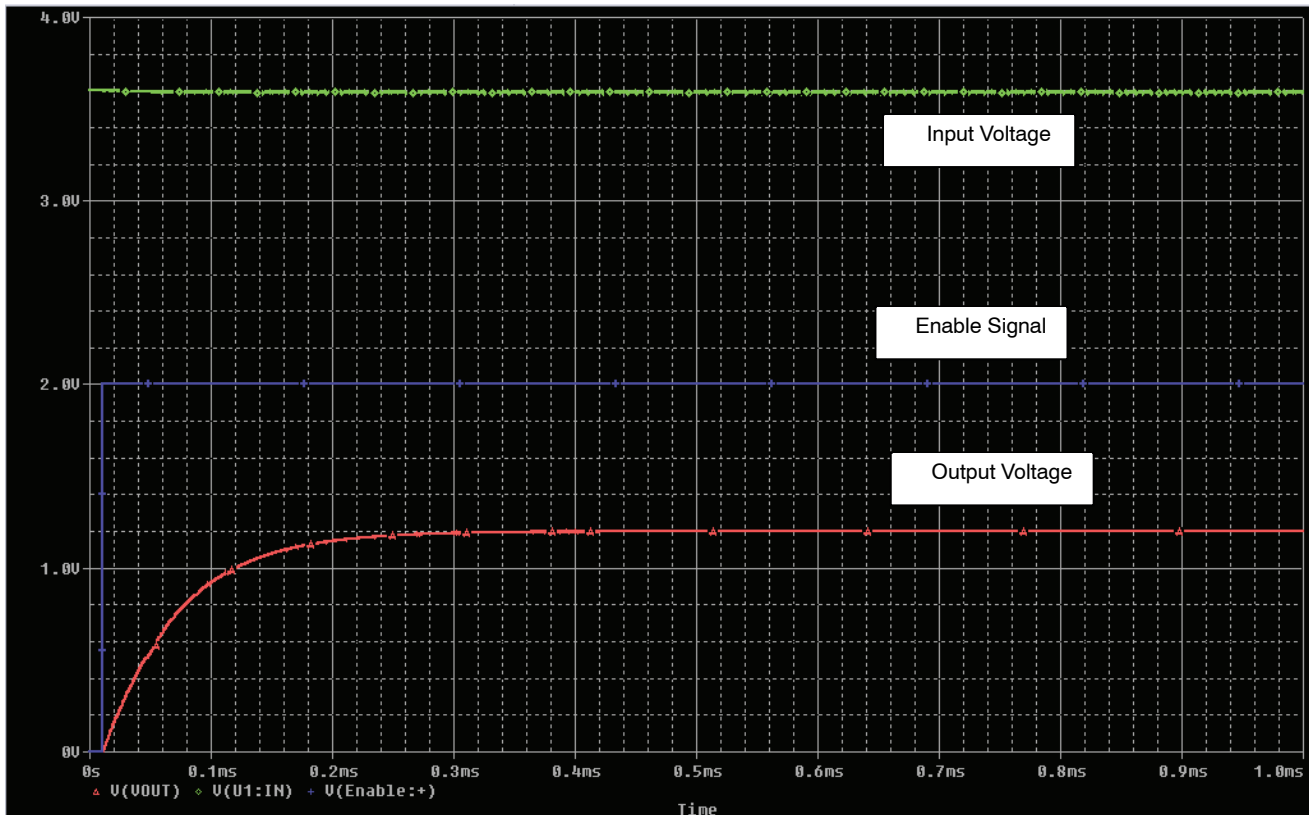
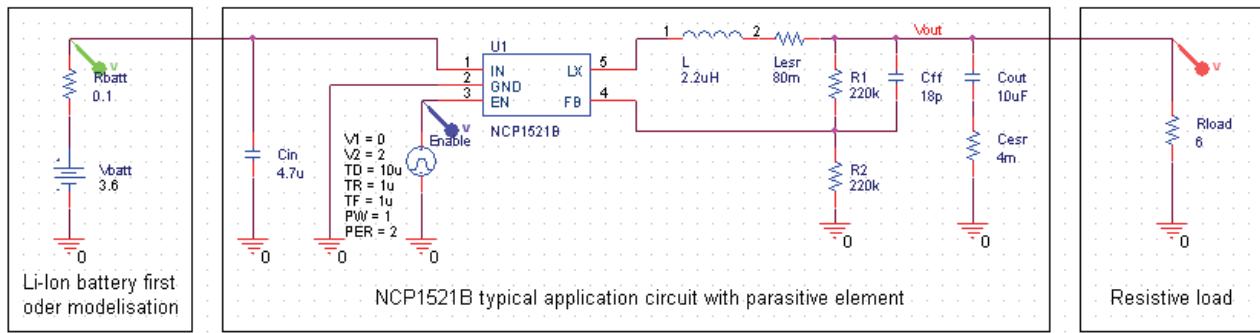
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7. NCP1521B.LIB simulation library file must be added to the current design.



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8. NCP1521B typical application circuit can be now simulated.



Additional Information

NCP1521B model is only a behavioral model which cannot fully reproduce NCP1521B device electrical characteristics. For further information on NCP1521B, visit our website <http://onsemi.com>.

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