

## TPS543B22 SIMPLIS Transient Model Features and Limitations

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\* TPS543B22

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\*\* Released by: Texas Instruments Inc.

\* Part: TPS543B22

\* Date: 21DEC2022

\* Model Type: TRANSIENT

\* Simulator: SIMPLIS

\* Simulator Version: 8.40h

\* EVM Order Number: TPS543B22EVM

\* EVM Users Guide: SLUUCH6 – SEPTEMBER 2022

\* Datasheet: SLVSFW2 – March 2022

\* Topologies Supported: Buck

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\* Model Version: Final 1.00

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\* Updates:

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\* Final 1.00

\* Release to Web.

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\* Model Usage Notes:

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\* A. Features have been modelled

\* 1. Output Voltage Setting

\* 2. Programmable Soft-Start

\* 3. Frequency and Operation Mode Selection

\* 4. Low-side FET Zero-Crossing

\* 5. Current Sense and Positive Overcurrent Protection(OCP)

\* 6. Low-side FET Negative Current Limit

\* 7. Power Good

- \* 8. Over Voltage Protection(OVP)
- \* 9. Under Voltage Protection(UVP)
- \* 10. Output Voltage Discharge
- \* 11. EN/VIN UVLO Protection
- \* 12. VCC UVLO Protection
- \* 13. BOOT functionality
- \* 14. This model can be used to simulate all the above features for the TPS543B25, TPS543A26, and TPS543A22 by selecting the right device in F11 window.

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#### \* B. Features have not been modelled

- \* 1. Operating Quiescent Current
- \* 2. Shutdown Current
- \* 3. Temperature dependent characteristics
- \* 4. Ground Pins have been tied to 0V internally and hence model does not support Inverting topologies.

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#### \* C. Application Notes

- \* 1. The parameter STEADY\_STATE has been used to reach the steady state faster.
- \* Keep STEADYSTATE = 0 to observe startup behaviour.
- \* Keep STEADYSTATE = 1 and appropriate IC on Inductor and capacitor to observe for faster Steady state and is must for AC Analysis.
- \* 2. This model can be used to simulate TPS543B25, TPS543A26, and TPS543A22 by selecting the right device in F11 window.

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