

## TPS544C26 SIMPLIS Transient Model Features and Limitations

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### \* Model Usage Notes:

#### \* \* A. Features have been modelled

- \* 1. Output Voltage Setting
- \* 2. Programmable Soft-Start
- \* 3. Frequency and Operation Mode Selection (FCCM and DCS Modes)
- \* 4. Safe start-up
- \* 5. Overcurrent Protection(OCP)
- \* 6. Input Voltage Over Voltage Protection (PVIN OV)
- \* 7. Open-drain power-good output (VRRDY)
- \* 8. Over Voltage Protection (OVP)
- \* 9. Under Voltage Protection (UVP)
- \* 10.EN/VIN UVLO Protection. The EN toggle function is not supported in this model.
- \* 11.BOOT functionality

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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.
- \* 5. Telemetry (V/I/T) and input power monitoring

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#### \* C. Application Notes

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- \* 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.
- \* 2. Once the PVIN over-voltage, VOUT UVP, VOUT OVP fault is triggered, the device latches off until Simulation is reset with the Fault cleared (No Fault Condition is present any more).
- \* 3. The I2C/PMBUS interface has not been implemented in the model. However, the model has several parameters that are used to mimic the behaviour of the interface.
- \* The user must carefully enter these values in accordance with the datasheet. The description of these parameters are as below:
  - \* - Extract the Compensation values from the code obtained using Compensation calculator in datasheet
  - \* - VCCM: Auto-skipping Eco-mode (DCM) OR 1 for FCCM mode
  - \* - ILIM: CURRENT LIMIT
  - \* - SS\_TIME: SOFTSTART time
  - \* - FSW: Switching frequency
  - \* - VOUT: Output Voltage
  - \* - VOUT\_resolution: VOUT Resolution

- \* - PVINOV: Input Over-Voltage Protection
- \* - OVP: VOUT Over Voltage
- \* - UVP: VOUT under voltage
- \* - UV\_Delay: Under Voltage delay
- \* - DCLL: DC Load line setting
- \* - INT\_GAIN: Integrator gain setting
- \* - AC\_GAIN: AC gain setting
- \* - ACLL: AC load-line setting
- \* 4- The BOM, VIN, ILOAD parameter can be adjusted as needed on the F11 window
- \* 5- EN with delayed time can be supported on the STARTUP model by entering the
- \* {EN\_Delay} time in the F11 window

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