

# TPS6286810C PSPICE Transient Model Features and Limitations

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\* Model Usage Notes:

\* A. The following features have been modelled

- \* 1. RON and variation with VIN
- \* 2. Power Save Mode or Forced PWM Mode.
- \* 3. Low-side FET Zero-Crossing
- \* 4. Current Sense and Positive Overcurrent Protection (OCP)
- \* 5. Low-side FET Negative Current Limit
- \* 6. Power Good
- \* 7. Output Voltage Discharge
- \* 8. UVLO Protection
- \* 9. Software Enable
- \* 10. Vout Ramp speed
- \* 11. Hiccup or latching protection

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\* B. Features have not been modeled

- \* 1. Operating Quiescent Current
- \* 2. Shutdown Current
- \* 3. Temperature dependent characteristics
- \* 4. SCL and SDA pin functionalities.
- \* 5. Ground pins have been tied to 0V internally. Therefore, this model cannot be used for inverting topologies.

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\* C. Application Notes

- \* 1. The parameter STEADY\_STATE has been used to reach the steady state faster.  
Keep STEADY\_STATE = 0 to observe startup behaviour  
Keep STEADY\_STATE = 1, Vout = output voltage value and appropriate IC on Inductor and capacitor to observe for faster Steady state .
- \* 2. Additional pins and parameters has been added to model I2C registers.
- \* 3. The SOFTWARE\_ENABLE Pin maps to Control Register bit for Software Enable.  
SOFTWARE\_ENABLE= 0 - Disable the device. All registers values are still kept.  
SOFTWARE\_ENABLE= 1 - Re-enable the device with a new startup without the tDelay.
- \* 4. The parameter ENABLE\_FPWM\_DURING\_VOUT\_CHANGE maps to Control Register bit for Enable FPWM mode during output voltage change and the ENABLE\_FPWM pin maps to Control Register bit for Enable FPWM Mode.  
If ENABLE\_FPWM\_DURING\_VOUT\_CHANGE=1 and ENABLE\_FPWM=0, and if the device goes from CCM to DCM, 128 cycles of FPWM is activated.  
After that the device goes to PFM.  
If ENABLE\_FPWM\_DURING\_VOUT\_CHANGE= 0, then, ENABLE\_FPWM takes control.

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- \* 5. The parameter VOUT\_RAMP\_SPEED maps to Control Register bit for Voltage
- \* ramp speed.
- \* The ramp speed is defined by VOUT\_RAMP\_SPEED (0->20mV/us,1->10mV/us,2-
- \* >5mV/us,3->1mV/us)
- \* 6. The parameter ENABLE\_HICCUP maps to Control Register bit for Enable HICCUP.
- \* ENABLE\_HICCUP= 1 - Enable HICCUP, Disable latching protection.
- \* ENABLE\_HICCUP= 0 - Disable HICCUP. Enable latching protection.
- \* 7. The parameter ENABLE\_OUTPUT\_DISCHARGE maps to Control Register bit for
- \* Enable Output Discharge.
- \* When ENABLE\_OUTPUT\_DISCHARGE=1, VOUT discharges through Discharge
- \* Resistor, Else discharge is only through load.
- \* 8. The Pin VOUT\_REG maps to Vout Register available in the device. The device has
- \* fixed startup output voltage of 0.9V, thereafter it ramps up/down to the Vout
- \* value provided via Vout Register.

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