

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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