NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Revision 2.2:

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FB	17	Feedback Input. Connect a resistor divider from VOUT to FB to set up output voltage. The device regulates FB to the internal reference value of 1.2V typical.
COMP	18	Output of the error amplifier and switching converter loop compensation point.
ILIM	19	Inductor peak current limit set point input. A resistor connecting this pin to ground sets current limit through low-side power FET.
AGND	20	Analog ground. Analog ground should be used as the common ground for all small signal analog inputs and compensation components. No electrical connection to PGND inside.
PGND	21	Power ground. Must be soldered directly to ground planes using multiple vias directly under the IC for improved thermal performance and electrical contact.

Over operating free-air temperature range unless otherwise noted

PARAMETER	DEFINITION	MIN	MAX	UNIT
V_{IN}	Input voltage range	2.7	14	V
V_{OUT}	Output voltage range	4.5	14.6	V
T_J	Operating junction temperature	-40	125	°C

PARAMETER	DEFINITION	MIN	MAX	UNIT
V_{ESD}	Human Body Model (HBM), per ANSI-JEDEC-JS-001-2014 specification, all pins (1)	-2	+2	kV
	Charged Device Model (CDM), per ANSI-JEDEC-JS-002-2014specification, all pins (1)	-0.5	+0.5	kV

(1) HBM and CDM stressing are done in accordance with the ANSI/ESDA/JEDEC JS-001-2014 specification

PARAMETER	THERMAL METRIC	DFN

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V_{IN}=3.6V, T_J=-40°C~125°C, typical values are tested under 25°C.

SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
Power Supply and Output						
V_{IN}	Operating input voltage		2.7		14	V
V_{OUT}	Output voltage range		4.5V		14.6	V
V_{IN_UVLO}	Input UVLO Hysteresis	V_{IN} rising		2.6 200	2.7	V mV
I_{SD}	Shutdown current	EN=0, No load. Measured on VIN pin		1	3	uA
I_Q	Quiescent current from VIN					

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SYMBOL	PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
T_{SD}	Thermal shutdown threshold Hysteresis142.22 14.4 reW*nBT/F3 9 T	T_J rising		150		°C

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Product4*2527.14 695.5 Tm.824 GD

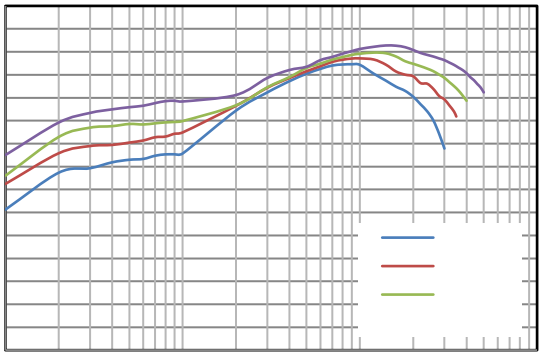

Figure 1. Efficiency, Vout=9V, fsw=560KHz, PFM

Figure 2. Efficiency, Vin=3.6V, fsw=560KHz, PFM

Figure 3. Efficiency, Vout=9V, fsw=560KHz, PWM

Figure 4. Efficiency, Vin=3.6V, fsw=560KHz, PWM

Figure 5. Switching Frequency vs FSW Resistance

Figure 6. Inductor Peak Current Limit vs RLIM Resistance

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Figure 7. Frequency vs Temperature

Figure 8. Quiescent Current vs Temperature

Figure 9. Shutdown Current vs Temperature

Figure 10. Feedback Reference Voltage vs Temperature

Figure 11. Load Regulation (Vin=3.6V, Vout=9V)

Figure 12. Line Regulation

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Enable and Start -up

When applying a voltage higher than the EN high threshold (maximum 1.2V), the SCT12A0 enables all functions and starts converter operation. To disable converter operation, EN voltage needs fall below its lower threshold (minimum 0.4V). the ground. Floating EN pin automatically disables the device.

The SCT12A0 features programmable soft start to prevent inrush current during power-up. SS pin sources an internal 5 current charging an external soft-start capacitor C_{SS} when EN pin exceeds turn-on threshold. The device uses the lower voltage between the internal voltage reference 1.2V and the SS pin voltage as the reference input voltage of error amplifier and regulates the output. The soft-start completes when SS pin voltage exceeds the internal 1.2V reference. Use equation 1 to calculate the soft-start time (10% to 90%). When EN pin is pulled low to disable the device, the SS pin will be discharged to ground.

$$t_{SS} = \frac{C_{SS} \quad V_{REF}}{I_{SS}} \tag{1}$$

where

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calculations and bench evaluation. In this application, the WB's inductor CDMC8D28NP-1R2MC is used on SCT12A0 evaluation board.

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$$( ) = \frac{\times (1 - \quad)}{2 \times} \times (1 + \frac{}{2 \times})(1 + \frac{}{2 \times})$$

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