

Description

The Silicon Creations DCDCTS13GBST0933 is a DC/DC switching boost converter implemented in standard CMOS and intended for integration in an SOC. It is designed to boost a single Alkaline Cell voltage (0.9V-1.5V) to 2.5 or 3.3V. The topology is optimized to provide 94% efficiency at 50mA load current and 3.3V. The topology uses only four package pins. Anti-ringing circuitry allows integration on an SOC with minimal supply bounce

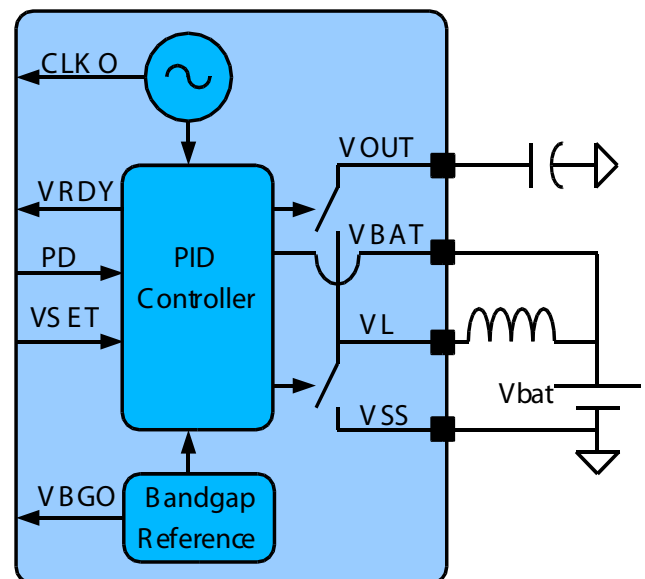
Features

- 94% efficiency at 50mA load current
- Designed for use with 2.2 μ H external inductor, 4.7 μ F external ceramic capacitor
- Battery voltage from 0.9V to 1.8V
- 50mA maximum load current
- Integrated short circuit protection
- Integrated ESD protection
- Integrated bandgap reference, oscillator
- Anti-ringing circuitry
- Voltage ready indication
- Output voltage programming
- Bandgap voltage output
- Digital soft start

Applications

- Mobile applications running off of a single Alkaline battery cell
- Analog or I/O voltage generation from a core voltage supply rail

Block Diagram



Operating Conditions

The following table shows recommended operating conditions for integrated circuits developed with this library.

	Condition	Minimum	Typical	Maximum
V ^{BAT}	Battery Voltage	0.9V		1.8V
T ^J	Junction Temperature	-40°C	25°C	125°C

DC/DC Characteristics

Parameter	Units	Min	Typ	Max	Comment
Output Voltage (high)			3.3V		
Output Voltage (low)			2.5V		
Accuracy				+/-3%	
Average Load Current	mA	0		50	
External Inductor					
- Inductance	Henry		2.2μH		
- Series resistance	Ohms		0.2		
External Capacitor					Ceramic
- Capacitance	Farads		4.7μF		
- ESR	Ohms		0.1		
Efficiency	%		94		@50mA load, 3.3V output
Startup Time	μS			1000	
Closed Loop Bandwidth	kHz		55		
Current Limit	mA		1000		
DC Line Regulation				1%	
DC Load Regulation				1%	
Power down mode (PD)	μA			10	Temp = 125C
Oscillator Frequency	MHz	1.3	2	3	
Bandgap voltage	V		1.2V		
Core area	mm ²		0.5		

DC/DC Pin List

Pin Name	Type	Function	Notes/Restrictions
VOUT	Pin/Output	2.5/3.3V output	May require multiple bondwires depending on max current
VBAT	Pin/Input	Battery input voltage	0.9-1.98V
VL	Pin/Input	Inductor connection	May require multiple bondwires depending on max current
VSS	Pin	Ground connection	May require multiple bondwires depending on max current
VSET	Input	Voltage set,=1 results in VOUT=3.3V,else 2.5V	0.9V-3.3V
PD	Input	Power down	0.9V-3.3V
VRDY	Output	Voltage ready	Output voltage level
CLKO	Output	Clock out, 2MHz nom	Output voltage level
VBGO	Output	Bandgap output, 1.2V nom	

W O R L D W I D E I N Q U I R I E S

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