PRELIMINARY - January 28, 2000 TEL:805-498-2111 FAX:805-498-3804 WEB:http://www.semtech.com

DESCRIPTION

The SC1461 is a versatile charge pump designed for use in battery operated power supply applications. A simple, low current boost circuit can be implemented without costly inductors or capacitors. Internal MOSFETs and control circuitry eliminate the need for costly board space and design time. The small device footprint allows for compact circuit design.

The SC1461 is a Capless™ charge pump for applications that require up to 8mA of output current. Three modes of output voltage can be programmed via the ADJ pin.

Modes include: $V_O = 1.515 * V_{IN}$, $V_O = 1.32 * V_{IN}$, and the adjustable mode where an external resistor divider determines the output voltage. The SC1461 is packaged in a 5 lead SOT-23 package.

FEATURES

- Small size - 5 pin SOT-23 package
- 4% voltage accuracy
- 65uA typ. quiescent current
- User selectable output voltages of $1.515 * V_{IN}$, $1.32 * V_{IN}$, or adjustable output

APPLICATIONS

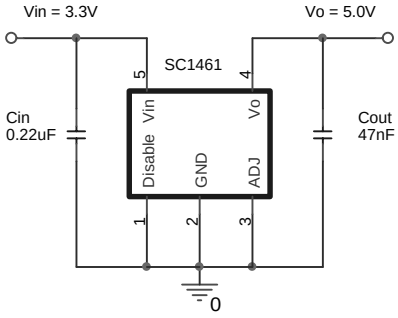
- PDA Power Supplies
- Notebook Power Supplies
- Peripheral Card Supplies
- Industrial Power Supplies
- High Density DC/DC Conversion

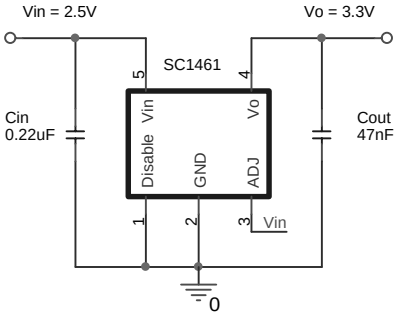
ORDERING INFORMATION

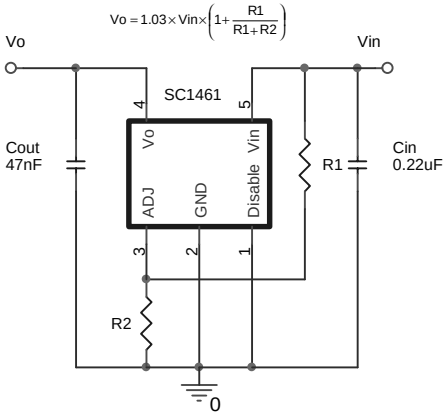
DEVICE(1)	PACKAGE
SC1461CSK	5-SOT-23

Note:
(1) Add suffix 'TR' for tape and reel.

TYPICAL APPLICATION CIRCUITS







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ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Maximum	Units
Supply Voltage	VIN	-0.3 to +3.63	V
Output Voltage	VO	-0.3 to +5.5	V
Thermal Resistance Junction to Ambient	θ_{JA}	410	°C/W
Operating Temperature	T_A	-40 to +85	°C
Temperature Range	T_J	0 to +95	°C
Storage Temperature	T_{STG}	-65 to +150	°C
Lead Temperature (Soldering) 10 seconds	T_L	300	°C

ELECTRICAL CHARACTERISTICS

Unless specified: VIN = 3.3V (ADJ = DISABLE = 0), VIN = 2.5V (ADJ = VIN, DISABLE = 0), $0 \le I_O \le 8mA$, C_{IN} = 0.22uF, C_{OUT} = 47nF, T_A = 25°C. Values in **bold** apply over full operating temperature range

Parameter	Symbol	Conditions	MIN	TYP	MAX	Units
Input Supply Voltage	V_{IN}		2.25		3.63	V
Input Supply Current	I_{IN}	ADJ, DISABLE = GND, V_{IN} = 3.3V, I_O = 0mA		65	100	µA
		ADJ = GND, DISABLE = V_{IN} = 3.3V, I_O = 0mA		0.1	1	
Output Voltage	V_O	ADJ, DISABLE = GND, V_{IN} = 3.3V	-2	1.515 x VIN	2	%
			4		**4**	
		ADJ = V_{IN} = 2.5V, DISABLE = GND	-2	1.32 x VIN	2	
			4		**4**	
Output Ripple (pk-pk)	V_R	I_O = 8mA, C_{OUT} = 47nF		50		mV
Output Current	I_O	ADJ = V_{IN} = 2.5V, DISABLE = GND	8	10		mA
		ADJ, DISABLE = GND, V_{IN} = 3.3V	8	10		mA
Efficiency	η	ADJ = V_{IN} = 2.5V, DISABLE = GND, I_O = 8mA		50		%
Oscillator Frequency	OSC	ADJ = V_{IN} = 2.5V, DISABLE = GND		12		MHz
		ADJ = DISABLE = GND, V_{IN} = 3.3V		13.5		
Time to Regulation at Turn-On	t_{ON}	ADJ = V_{IN} = 2.5V, DISABLE = GND, I_O = 8mA. C_{OUT} = 47nF		25		µs
Disable Threshold Voltage	D_{ISHI}			1	1.3	V
	D_{ISLO}		.5	0.9		V
$I_{DISABLE}$		Disable = 0V		1	10	µA

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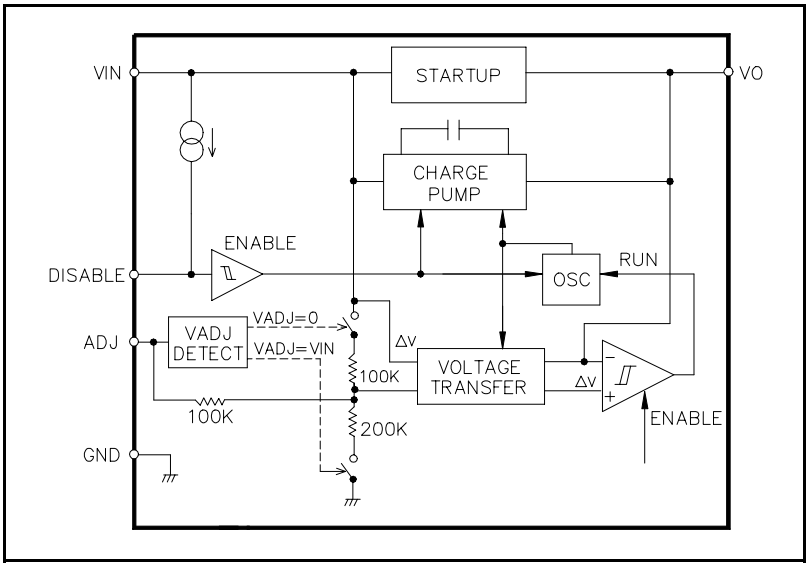
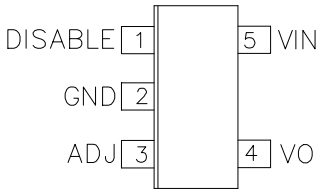
BLOCK DIAGRAM



PIN CONFIGURATION

(Top View)



5 Lead SOT-23

PIN DESCRIPTION

Pin #	Pin Name	Pin Function
1	DISABLE	Disable pin is internally pulled to VIN resulting in standby mode and the output will be disabled. Grounding this pin will enable the output.
2	GND	Ground.
3	ADJ	Mode selection pin. Grounding this pin will yield V_O = 1.515 * V_{IN}. Pulling this pin to VIN will yield V_O = 1.32*V_{IN}. An external voltage divider connected at VIN will achieve $Vo = 1.03 \times Vin \times \left(1 + \frac{R1}{R1+R2}\right)$ See Applications Circuits.
4	VO	Voltage output.
5	VIN	Supply voltage input.

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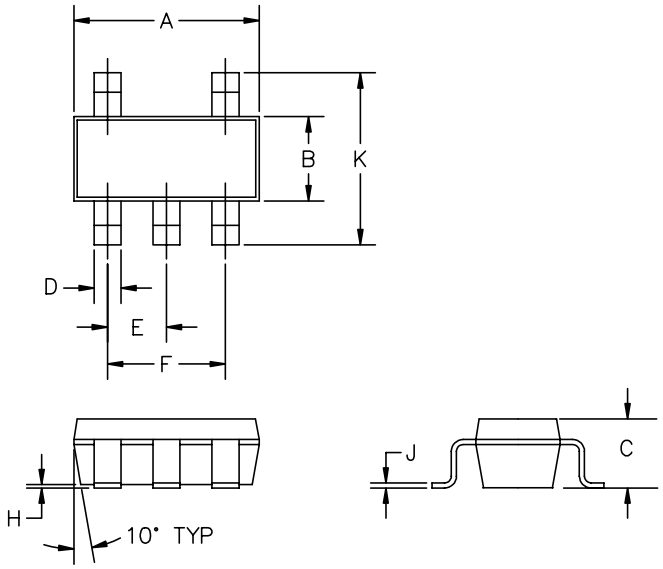
OUTLINE DRAWING SOT-23-5L



DIMENSIONS [1]					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.110	.120	2.80	3.05	–
B	.059	.070	1.50	1.75	–
C	.036	.051	.90	1.30	–
D	.014	.020	.35	.50	–
E	.033	.040	.85	1.05	–
F	.067	.083	1.7	2.1	–
H	.0004	.006	.010	.150	–
J	.0035	.008	.090	.20	–
K	.102	.118	2.6	3.00	–

[2] PACKAGE OUTLINE EXCLUSIVE OF MOLD FLASH AND METAL BURR.

[1] CONTROLLING DIMENSIONS: MILLIMETERS.

ECN 00-843

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