PRELIMINARY - May 18, 2000 TEL:805-498-2111 FAX:805-498-3804 WEB:http://www.semtech.com

DESCRIPTION

The SC1462 is a versatile charge pump designed for use in battery operated power supply applications over the wide input range of 1.65 to 5.5 volts. A simple, low quiescent current charge pump doubler 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 6 lead SOT-23 package helps minimize board space.

The SC1462 charge pump can be used for applications that require 50mA or more of output current with V_{IN} = 2.5V to 5.5V.

FEATURES

- Small size - 6 pin SOT-23 package
- Typical efficiency of 90% @ full load
- Short circuit and over-temperature protection
- 190µA typical input current @ no load
- Shutdown current <1µA
- Fixed frequency of 160kHz

APPLICATIONS

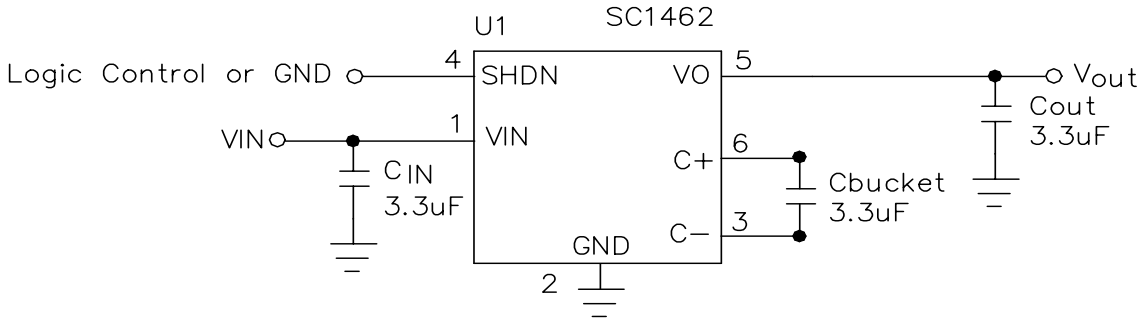
- Cellular phones
- Handheld devices

ORDERING INFORMATION

DEVICE(1)	PACKAGE
SC1462ISK.TR	SOT-23-6

Note:
(1) Only available in tape and reel packaging.

TYPICAL APPLICATION SCHEMATIC



Vin	$Vout_{MIN}$	C_{bucket}	I_{OUT}
5.50V	10V	1.0 µF	100mA
3.30V	5.4V	0.47µF	70mA
2.85V	5.0V	3.3 µF	50mA
1.65V	2.5V	1.0 µF	30mA

© 2000 SEMTECH CORP. 652 MITCHELL ROAD NEWBURY PARK CA 91320

PRELIMINARY - May 18, 2000

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Maximum	Units
Supply Voltage	VIN	-0.3 to +6.0	V
Output Voltage	VO	-0.3 to +12	V
V_{OUT} Short Circuit Duration	SC	Indefinite	
Thermal Resistance Junction to Ambient	θ_{JA}	230	°C/W
Operating Ambient Temperature Range	T_A	-40 to +85	°C
Junction Temperature Range	T_J	-40 to +125	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C
Lead Temperature (Soldering) 10 seconds	T_L	300	°C

ELECTRICAL CHARACTERISTICS

Unless specified: T_A = -40°C to 85°C, SHDN = GND, $1.65V \le V_{IN} \le 5.5V$, $C_{IN} = C_{OUT} = C_{BUCKET} = 3.3\mu F$ (ESR = 0.3Ω).

Parameter	Symbol	Conditions	MIN	TYP	MAX	Units
Input Supply Voltage	VIN		1.65		5.5	V
Input Supply Current	I_{IN}	I_O = 0, V_{IN} = 2.5V freq = 160kHz		190		µA
		I_O = 0, V_{IN} = 3.6V freq = 160kHz		330		µA
		SHDN = VIN		0.1	1	µA
Output Current	I_O	$V_o \ge (2*V_{IN})$ — 0.50V, V_{IN} = 2.5V	50			mA
		$V_o \ge (2*V_{IN})$ — 0.50V, V_{IN} = 3.6V	60			mA
Maximum Output Voltage[3]	V_{OUT}	I_O = 0mA			$2*V_{IN}$	
Short Circuit Current	I_{SC}			90		mA
Output Ripple (pk-pk)[1][3]	V_R	I_O = 50mA, V_{IN} = 2.5V Frequency = 160kHz		75		mV
Power Efficiency[1]	η	I_O = 50mA, V_{IN} = 2.5V freq = 160kHz	86			%
Oscillator Frequency	OSC	$1.65V \le V_{IN} \le 5.5V$	120	160	200	KHz
Input High Threshold	V_{ih}	SHDN pin, $2.5 \le V_{IN} \le 5.5$	1.6			V
Input Low Threshold	V_{il}	SHDN pin, $2.5 \le V_{IN} \le 5.5$			0.4	V

© 2000 SEMTECH CORP.

PRELIMINARY - May 18, 2000

ELECTRICAL CHARACTERISTICS

Unless specified: T_A = -40°C to 85°C, SHDN = GND, 1.65V ≤ V_{IN} ≤ 5.5V, C_{IN} = C_{OUT} = C_{BUCKET} = 3.3µF (ESR = 0.3Ω).

Parameter	Symbol	Conditions	MIN	TYP	MAX	Units
Time to Regulation at Turn-on(2)	t_{ON}	I_O = 0 to 60 mA, V_{IN} = 3.6V freq = 160kHz		500		µs
Over Temperature protection(3)	O.T.			170		°C
Over Temperature Hysteresis(3)	O.T.H			10		°C

NOTES:

(1) All electrical characteristics are for the application circuit on page 1.

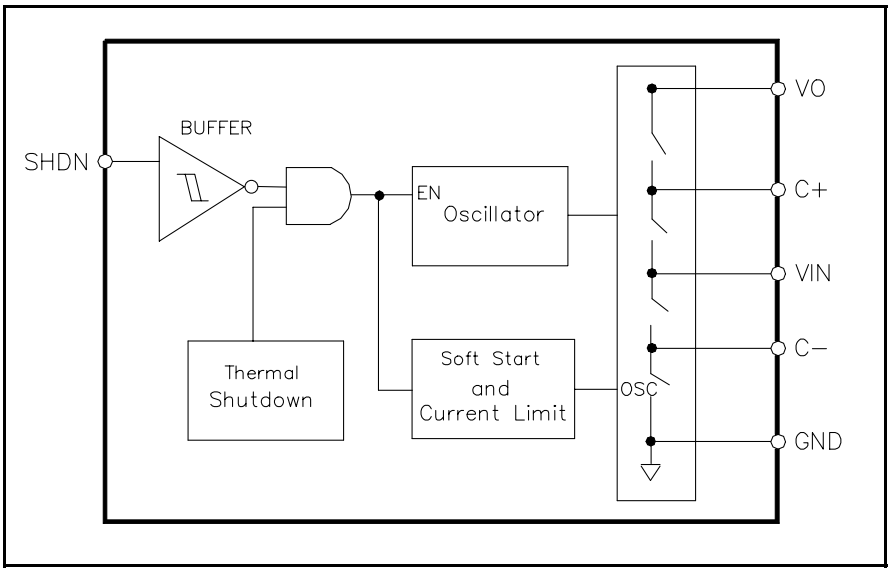
(2) Soft start functionality is performed along with short circuit protection. If V_{OUT} is less than V_{IN} - 200mV, then all switches are turned off and V_{OUT} is charged with a 90mA current source from V_{IN}. When V_{OUT} reaches V_{IN} - 200mV all switches are enabled.

(3) Guaranteed by design.

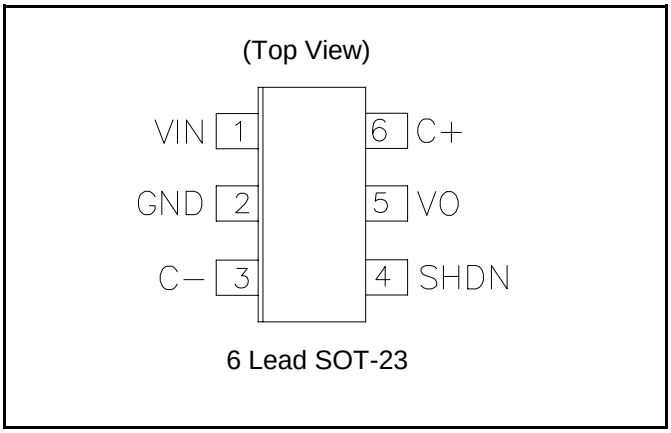
© 2000 SEMTECH CORP.

PRELIMINARY - May 18, 2000 TEL:805-498-2111 FAX:805-498-3804 WEB:http://www.semtech.com

BLOCK DIAGRAM



PIN CONFIGURATION

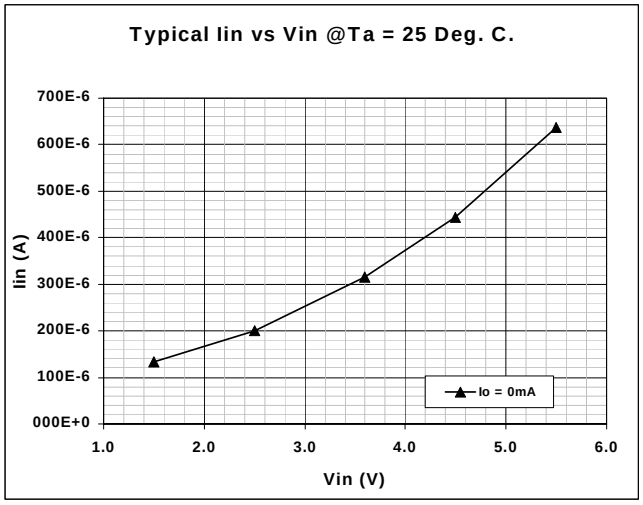


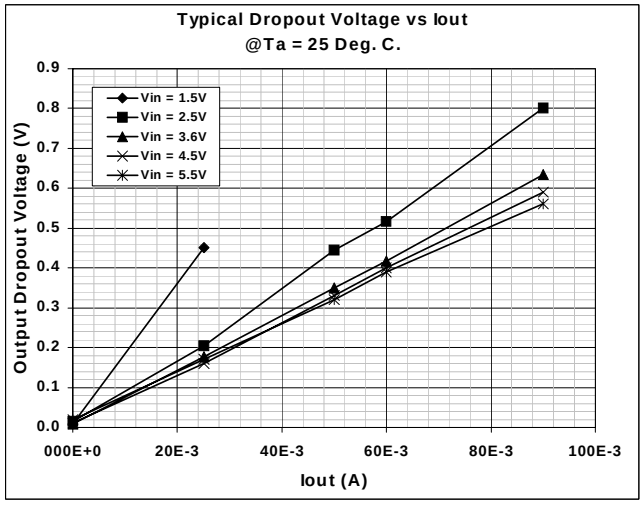
PIN DESCRIPTION

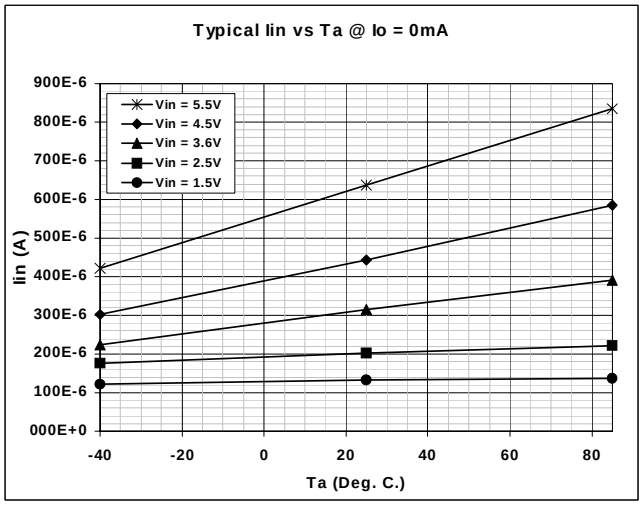
Pin # SOT-23-6	Pin Name	Pin Function
1	VIN	Supply voltage input.
2	GND	Ground.
3	C-	This pin should be connected to the negative terminal of the external charging capacitor.
4	SHDN	Shutdown pin. When this pin is connected to VIN, the device enters sleep mode.
5	VO	Voltage output.
6	C+	This pin should be connected to the positive terminal of the external charging capacitor.

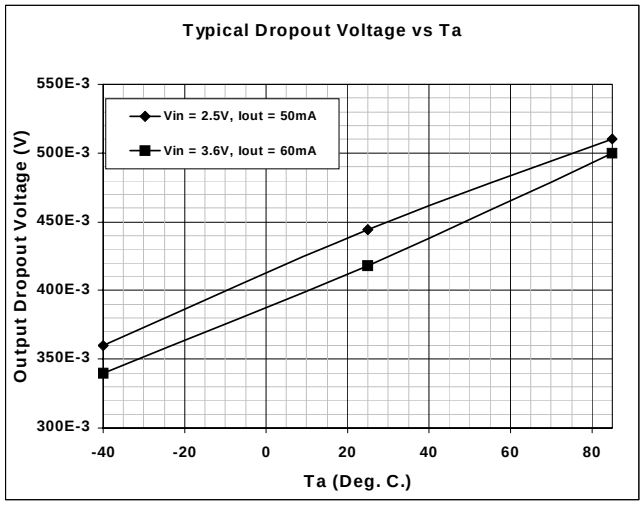
© 2000 SEMTECH CORP.

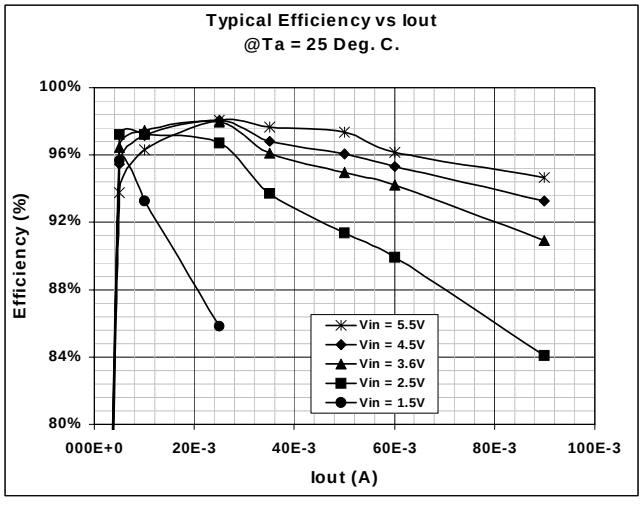
PRELIMINARY - May 18, 2000

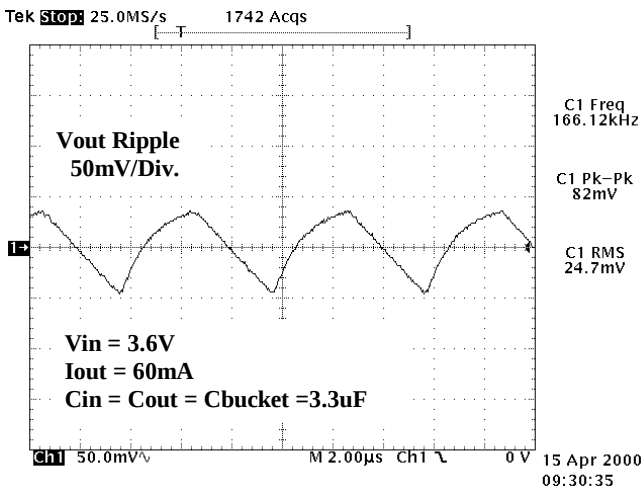








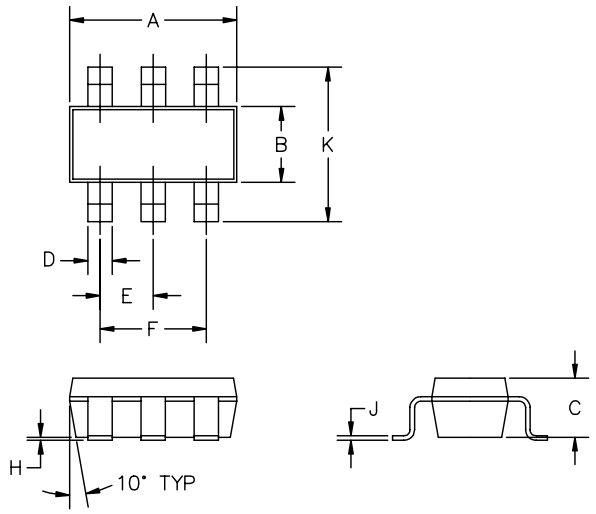




© 2000 SEMTECH CORP.

PRELIMINARY - May 18, 2000
TEL:805-498-2111 FAX:805-498-3804 WEB:http://www.semtech.com

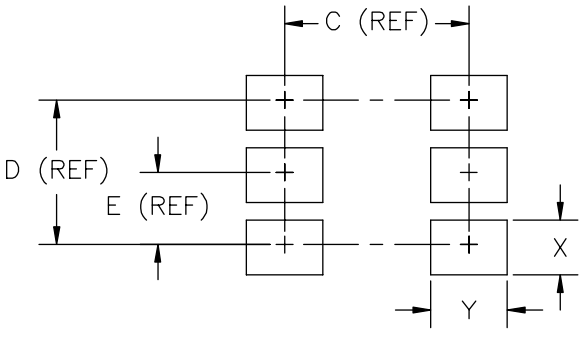
DEVICE OUTLINE - SOT23-6L



DIMENSIONS (1)					
DIMN	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.

MINIMUM LAND PATTERN - SOT23-6L



DIMENSIONS			
DIMN	INCHES	MM	NOTE
C	.094	2.4	–
D	.074	1.9	–
E	.037	.95	–
X	.028	.7	–
Y	.039	1.0	–

ECN00-1109

© 2000 SEMTECH CORP.
652 MITCHELL ROAD NEWBURY PARK CA 91320