

PRELIMINARY - July 6, 1999

TEL:805-498-2111 FAX:805-498-3804 WEB:http://www.semtech.com

## DESCRIPTION

The SC1460 is a versatile charge pump designed for use in battery operated power supply applications requiring up to 5mA. It enables a simple low current boost circuit to be implemented without the costly inductors or capacitors associated with regular switching circuits. Features include internal MOSFETs, control circuitry and charge pump capacitor, requiring only two external capacitors for a total solution. With a very high operating frequency (8MHz free running at 2.5V in typically), the SC1460 does not require large input or output capacitors, and therefore uses very little board space. Two versions of the SC1460 are available: the -3.3 produces a regulated 3.3V output from 2.5V in, and the -5.0 produces a regulated 5V output from 3.3V in. It is supplied in the popular 3 lead, SOT-23 package.

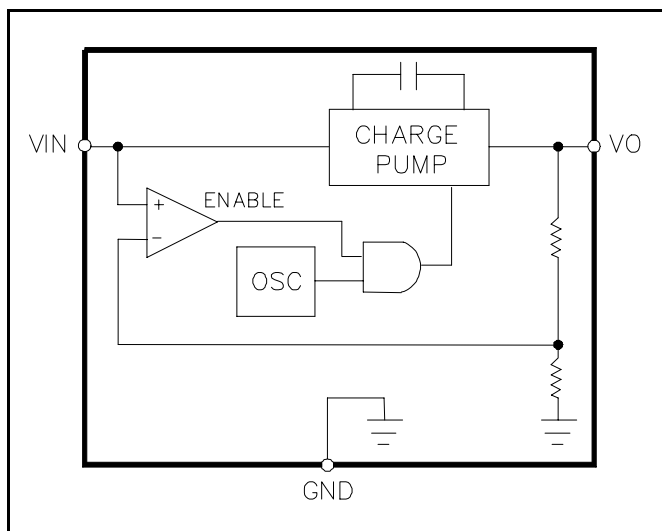
## FEATURES

- Small size - SOT-23 package
- 4% voltage accuracy
- Typical 100uA quiescent current

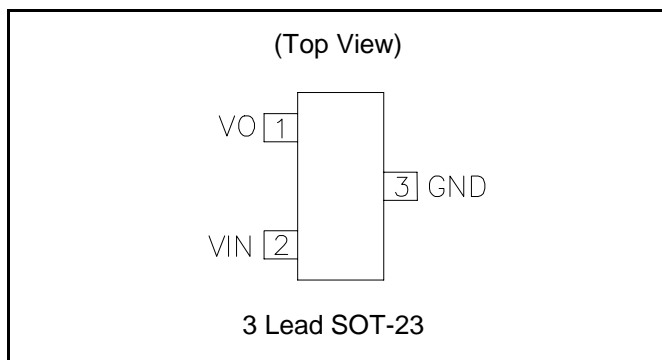
## APPLICATIONS

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

## BLOCK DIAGRAM



## PIN CONFIGURATION



## ORDERING INFORMATION

| DEVICE <sup>(1)(2)</sup> | PACKAGE |
|--------------------------|---------|
| SC1460CSK-X.X            | SOT-23  |

Notes:

(1) Where X.X denotes voltage options. Available voltages are: 3.3V and 5.0V.

(2) Add suffix 'TR' for tape and reel.

## ABSOLUTE MAXIMUM RATINGS

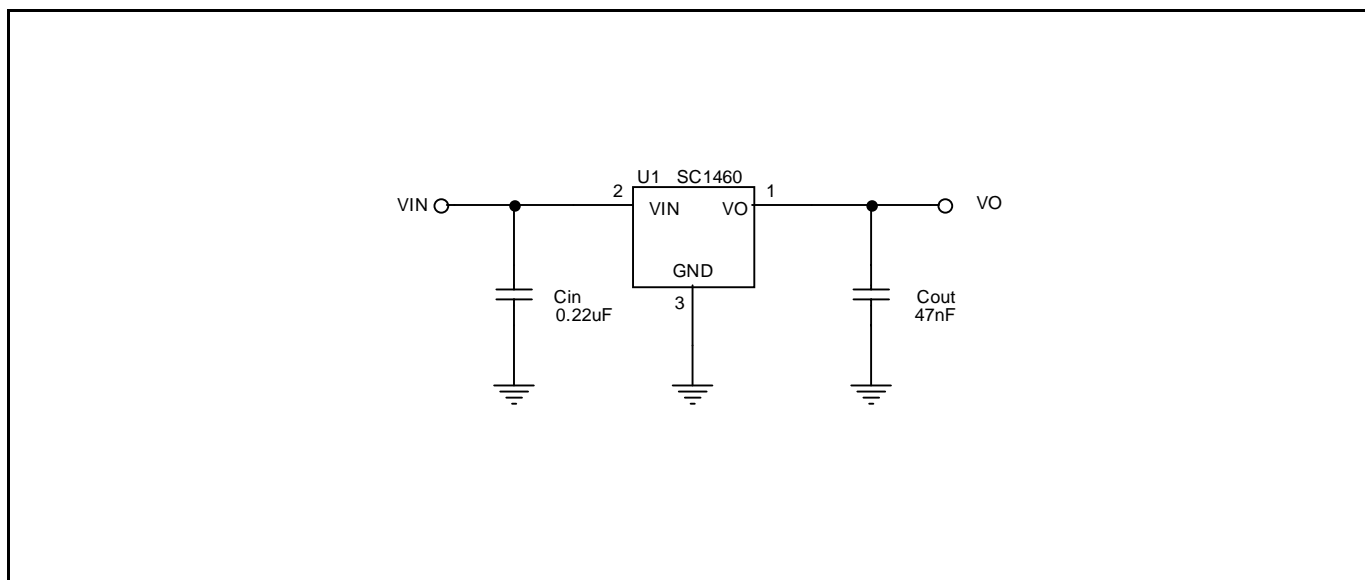
| Parameter                               | Symbol           | Maximum      | Units |
|---|------------------|--------------|-------|
| Supply Voltage                          | VIN              | -0.3 to +4   | V     |
| Output Voltage                          | VO               | -0.3 to +6.0 | V     |
| Thermal Resistance Junction to Ambient  | $\theta_{JA}$    | 410          | °C/W  |
| Operating Temperature                   | T <sub>A</sub>   | 0 to +70     | °C    |
| Temperature Range                       | T <sub>J</sub>   | 0 to 125     | °C    |
| Storage Temperature                     | T <sub>STG</sub> | -65 to +150  | °C    |
| Lead Temperature (Soldering) 10 seconds | T <sub>L</sub>   | 300          | °C    |

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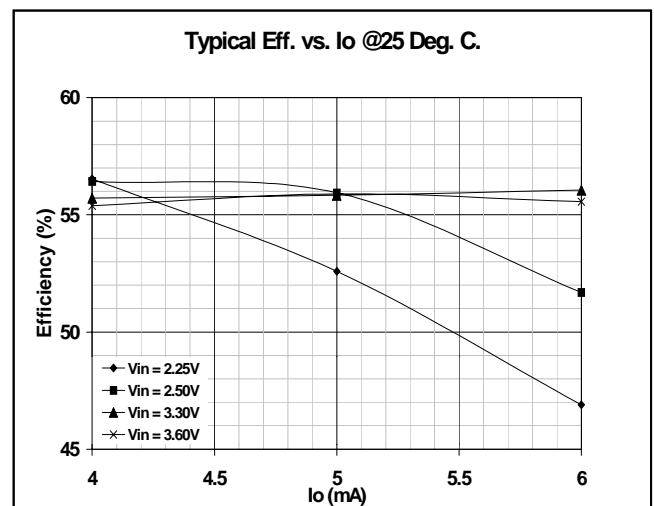
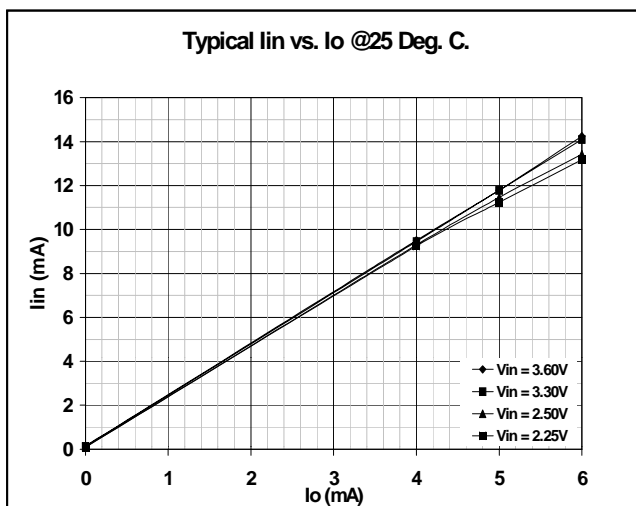
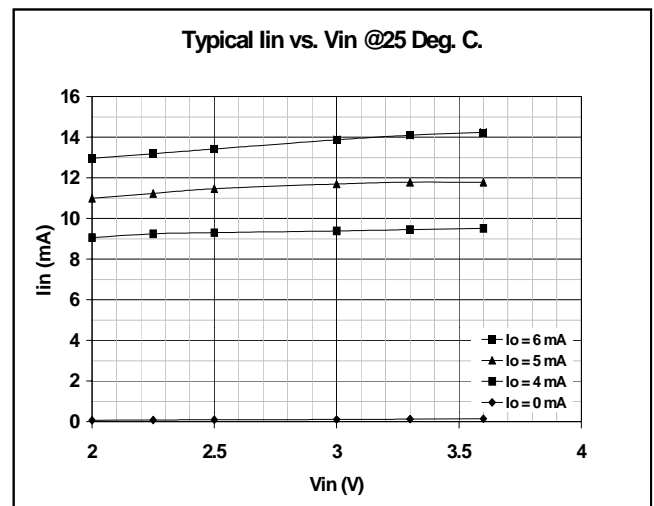
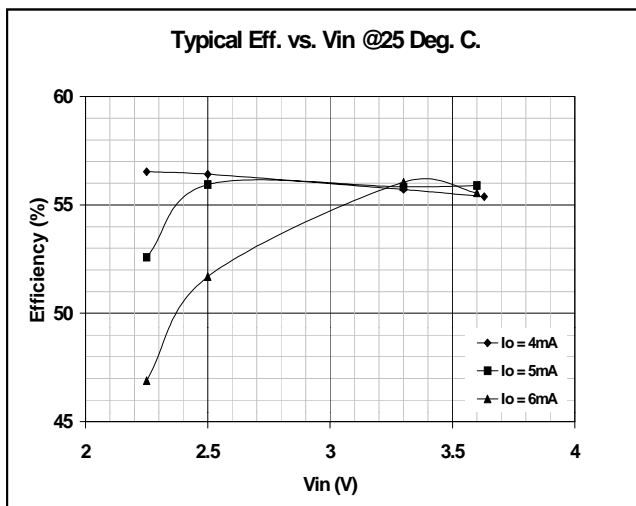
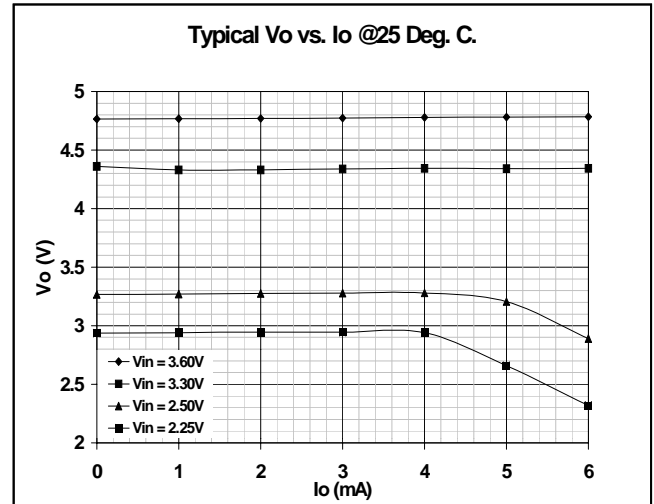
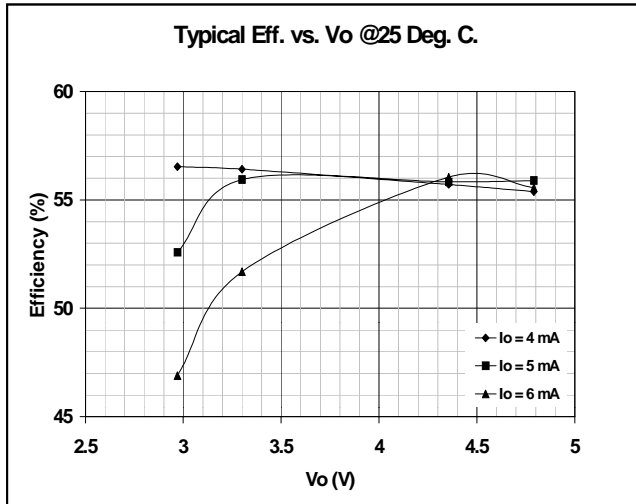
**ELECTRICAL CHARACTERISTICS**

 Unless specified:  $V_{IN} = 3.3V$  (-5.0 parts),  $V_{IN} = 2.5V$  (-3.3 parts),  $0 \leq I_O \leq 4mA$ ,  $C_{IN} = 0.22\mu F$ ,  $C_{OUT} = 47nF$ ,  $T_A = 25^\circ C$ . Values in **bold** apply over full operating temperature range

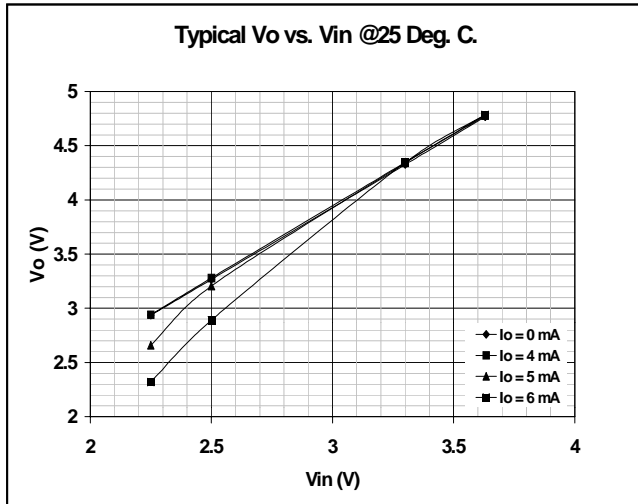
| Parameter                     | Symbol   | Conditions                       | MIN       | TYP                   | MAX      | Units   |
|-------------------------------|----------|----------------------------------|-----------|-----------------------|----------|---------|
| Input Supply Voltage          | $V_{IN}$ |                                  | 2.25      |                       | 3.63     | V       |
| Input Supply Current          | $I_{IN}$ | $I_O = 0mA$ $V_{IN} = 2.5V$      |           | 100                   | 150      | $\mu A$ |
| Output Voltage                | $V_O$    | SC1460CSK - 3.3, $V_{IN} = 2.5V$ | <b>-4</b> | $1.32 \times V_{IN}$  | <b>4</b> | %       |
|                               |          | SC1460CSK - 5.0, $V_{IN} = 3.3V$ | <b>4</b>  | $1.515 \times V_{IN}$ | <b>4</b> | %       |
| Output Ripple (pk-pk)         | $V_R$    | $I_O = 4mA$ , $C_{OUT} = 47nF$   |           | 50                    |          | mV      |
| Output Current                | $I_O$    |                                  | 4         | 5                     |          | mA      |
| Efficiency                    | $\eta$   | $I_O = 4mA$                      | 50        | 56                    |          | %       |
| Oscillator Frequency          | OSC      | SC1460CSK - 3.3, $V_{IN} = 2.5V$ |           | 8                     |          | MHz     |
|                               |          | SC1460CSK - 5.0, $V_{IN} = 3.3V$ |           | 8.75                  |          |         |
| Time to Regulation at Turn-On | $t_{ON}$ | Power Up with $I_O = 4mA$        |           | 100                   |          | $\mu s$ |

**APPLICATION CIRCUIT**


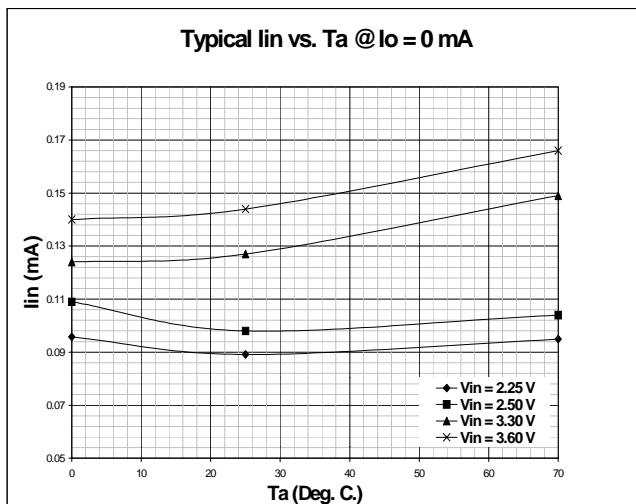
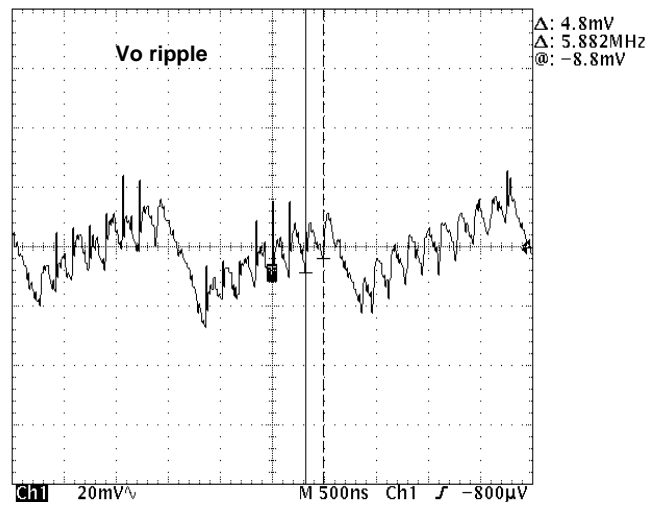
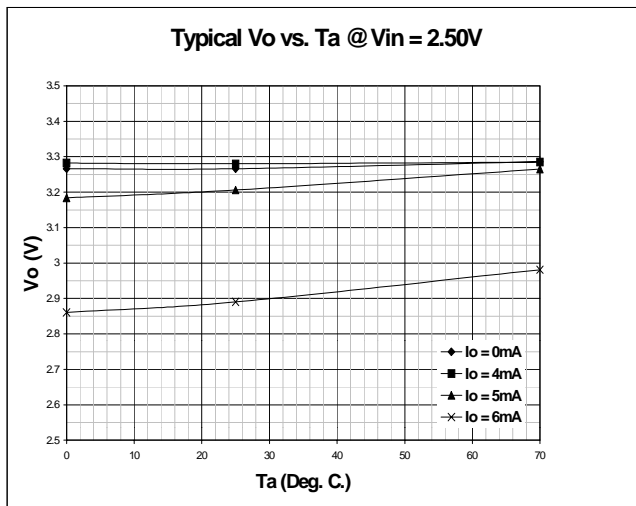
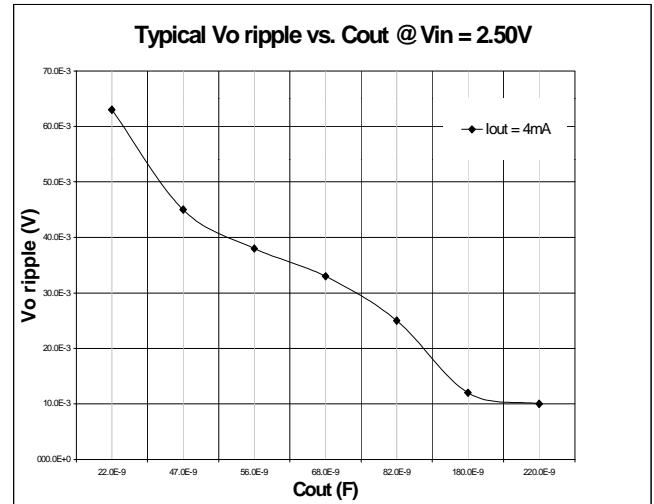
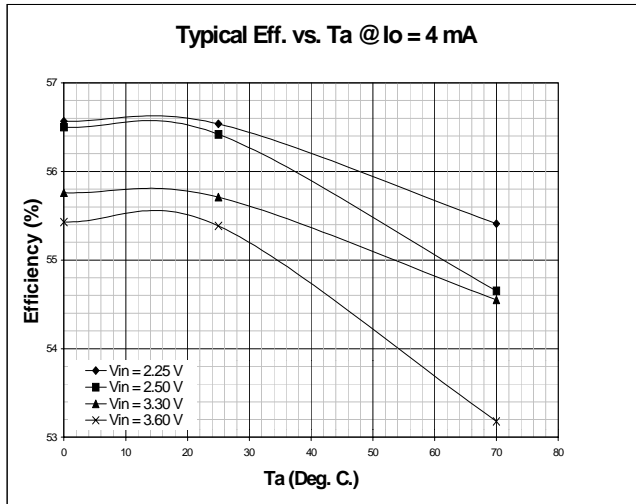
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**OUTLINE DRAWING SOT-23-3L**
