

**High Efficiency 2.0MHz, 1.5A Synchronous Step Down Regulator**

**General Description**

SY8842 is a high efficiency 2.0MHz synchronous step down DC/DC regulator capable of delivering up to 1.5A output currents. It can operate over a wide input voltage range from 2.6V to 5.5V and integrate main switch and synchronous switch with very low  $R_{DS(ON)}$  to minimize the conduction loss.

Low output voltage ripple, small external inductor and capacitor sizes are achieved with 2.0MHz switching frequency.

**Ordering Information**

SY8842      
 Temperature Code  
 Package Code  
 Optional Spec Code

Ordering Number	Package Type	Note
SY8842QWC	QFN1.5×1.5-7	----

**Features**

- 2.6~5.5V Input Voltage Range
- 55  $\mu$ A Low Quiescent Current
- Ultra Fast Load Transient Speed
- Low  $R_{DS(ON)}$  for Internal Switches (Top/Bottom) 180m $\Omega$  /100m $\Omega$
- High Switching Frequency 2.0MHz Minimizes the External Components
- Internal Soft-start Limits the Inrush Current
- Power Good Indicator
- Output Auto Discharge Function
- RoHS Compliant and Halogen Free
- Compact Package: QFN1.5×1.5-7

**Applications**

- Smart Phone
- Net PC
- Mini-notebook PC
- Access Point Router

**Typical Application**

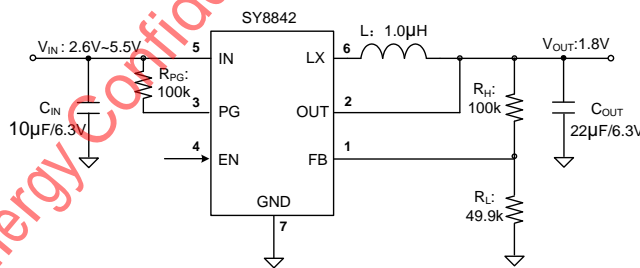


Figure1. Schematic Diagram

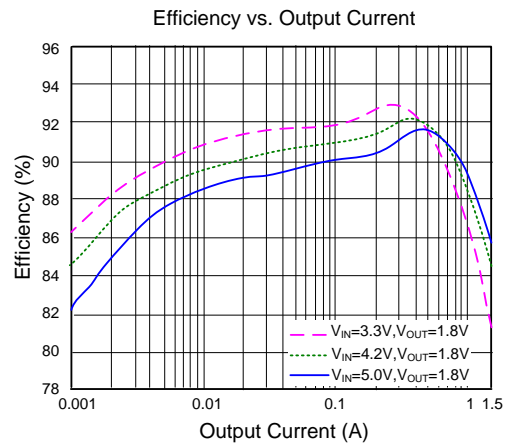
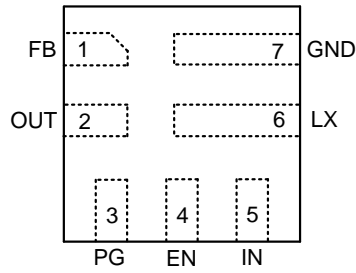


Figure2. Efficiency vs. Output Current

**Pin out (Top View)**



(QFN1.5×1.5-7)

Top Mark: aQxyz (device code: aQ, x=year code, y=week code, z=lot number code)

Pin Name	Pin Number	Pin Description
FB	1	Feedback pin. Connect this pin to the center point of the output resistor divider (as shown in Figure 1) to program the output voltage: $V_{OUT}=0.6V \times (1+R_H/R_L)$
OUT	2	Output feedback pin, connect to the output capacitor side.
PG	3	Power good indicator (open drain output). Low if the output < 90% or the output >120% of regulation voltage; High otherwise. Connect a pull-up resistor to the input.
EN	4	Enable control. Pull high to turn on. Do not leave it floating
IN	5	Input pin. Decouple this pin to GND pin with at least a 10 μF ceramic cap.
LX	6	Inductor pin. Connect this pin to the switching node of inductor.
GND	7	Ground pin.

Silergy Confidential-For Internal Use Only

**Block Diagram**

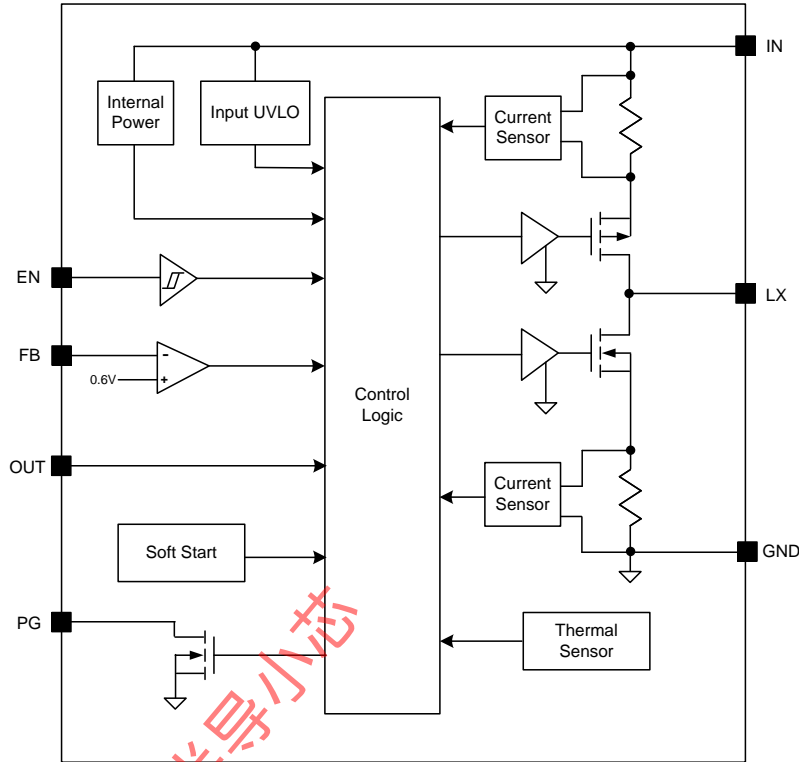


Figure3. Block Diagram

**Absolute Maximum Ratings** (Note 1)

Supply Input Voltage	-----	6.0V
EN, PG, OUT, FB Voltage	-----	$V_{IN} + 0.6V$
LX Voltage	-----	$-0.3V^{(*1)}$ to $6V^{(*2)}$
Power Dissipation, $P_D$ @ $T_A = 25\text{ }^\circ\text{C}$ , QFN1.5x1.5-7	-----	1.4W
Package Thermal Resistance (Note 2)		
$\theta_{JA}$	-----	70 $^\circ\text{C}/\text{W}$
$\theta_{JC}$	-----	8 $^\circ\text{C}/\text{W}$
Junction Temperature Range	-----	$-40\text{ }^\circ\text{C}$ to $150\text{ }^\circ\text{C}$
Lead Temperature (Soldering, 10 sec.)	-----	260 $^\circ\text{C}$
Storage Temperature Range	-----	$-65\text{ }^\circ\text{C}$ to $150\text{ }^\circ\text{C}$
(*1) LX Voltage Tested Down to $-3V < 40\text{ns}$		
(*2) LX Voltage Tested Up to $+7V < 40\text{ns}$		

**Recommended Operating Conditions** (Note 3)

Supply Input Voltage	-----	2.6V to 5.5V
Junction Temperature Range	-----	$-40\text{ }^\circ\text{C}$ to $125\text{ }^\circ\text{C}$
Ambient Temperature Range	-----	$-40\text{ }^\circ\text{C}$ to $85\text{ }^\circ\text{C}$

## Electrical Characteristics

( $V_{IN}=5.0V$ ,  $V_{OUT}=1.8V$ ,  $L=1.0\mu H$ ,  $C_{OUT}=22\mu F$ ,  $T_A=25^\circ C$ , unless otherwise specified)

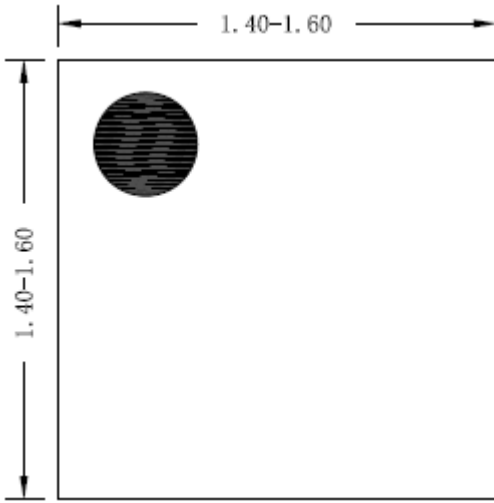
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	$V_{IN}$		2.6		5.5	V
Input UVLO Threshold	$V_{UVLO}$				2.6	V
Input UVLO Hysteresis	$V_{HYS}$			0.15		V
Quiescent Current	$I_Q$	$V_{FB}=V_{REF}\times 105\%$		55		$\mu A$
Shutdown Current	$I_{SHDN}$	$V_{EN}=0V$		0.1	1	$\mu A$
Feedback Reference Voltage	$V_{REF}$		594	600	606	mV
LX Node Discharge Resistance	$R_{DIS}$			50		$\Omega$
Top FET $R_{ON}$	$R_{DS(ON)1}$			180		m $\Omega$
Bottom FET $R_{ON}$	$R_{DS(ON)2}$			100		m $\Omega$
EN Input Voltage High	$V_{EN,H}$		1.1			V
EN Input Voltage Low	$V_{EN,L}$				0.4	V
PG Threshold for Under Voltage Detection	$V_{PG,UVF}$			90		% $V_{REF}$
PG Low Delay Time for Under Voltage Detection	$t_{UVF,DLY}$			15		$\mu s$
PG Threshold for Over Voltage Detection	$V_{PG,OVP}$			120		% $V_{REF}$
PG Low Delay Time for Over Voltage Detection	$t_{OVP,DLY}$			10		$\mu s$
Min ON Time	$t_{ON,MIN}$			40		ns
Maximum Duty Cycle	$D_{MAX}$		100			%
Turn On Delay	$t_{ON,DLY}$	from EN high to LX start switching		100		$\mu s$
Soft-start Time	$t_{SS}$			0.4		ms
Switching Frequency	$F_{SW}$	$I_{OUT}=1.0A$		2.0		MHz
Top FET Current Limit	$I_{LMT, TOP}$		1.8			A
Bottom FET Current Limit	$I_{LMT, BOT}$		1.5			A
Output Under Voltage Protection Threshold	$V_{UVP}$			40		% $V_{REF}$
Output UVP Delay	$t_{UVP,DLY}$			15		$\mu s$
Thermal Shutdown Temperature	$T_{SD}$			150		$^\circ C$
Thermal Shutdown Hysteresis	$T_{HYS}$			15		$^\circ C$

**Note 1:** Stresses beyond the “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

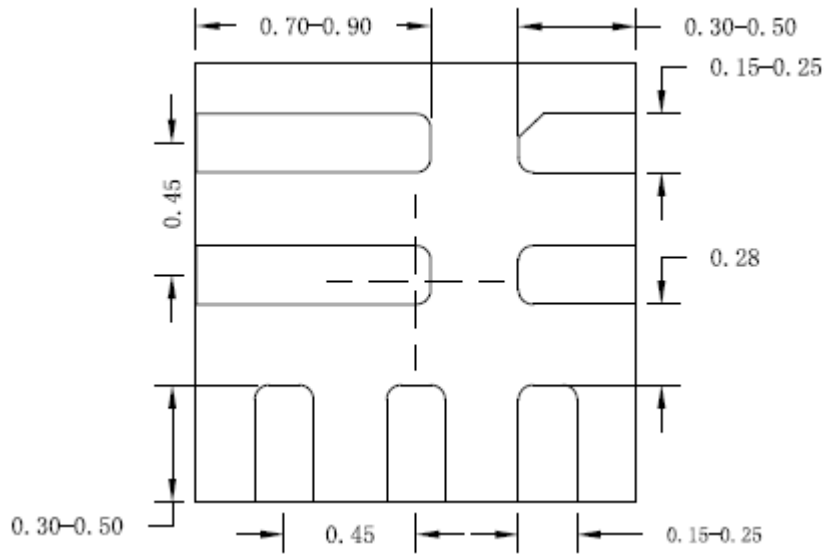
**Note 2:**  $\theta_{JA}$  of SY8842QWC is measured in the natural convection at  $T_A = 25^\circ C$  on 2OZ two-layer Silergy evaluation board. Pin 6 is the case position for SY8842QWC  $\theta_{JC}$  measurement.

**Note 3:** The device is not guaranteed to function outside its operating conditions.

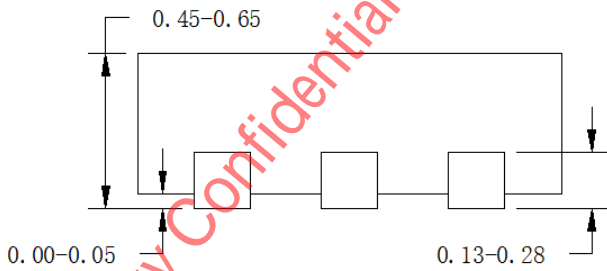
**QFN1.5×1.5-7 Package Outline Drawing**



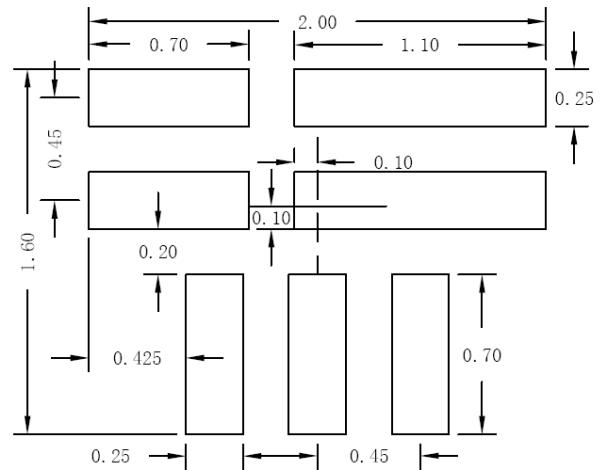
**Top View**



**Bottom View**



**Side View**

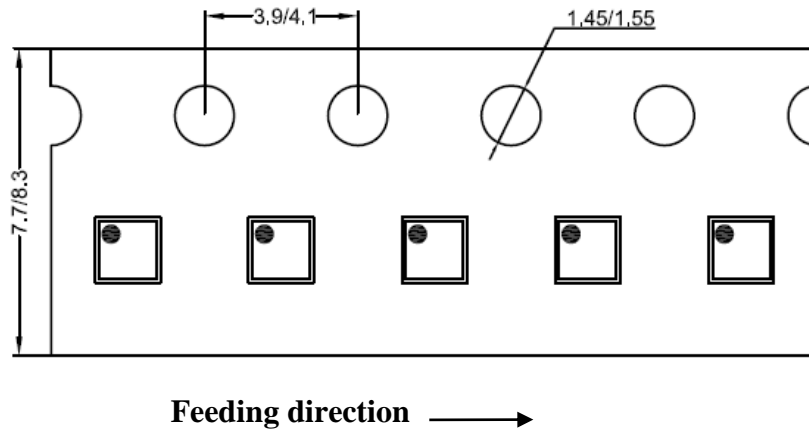


**Recommended PCB layout  
(Reference only)**

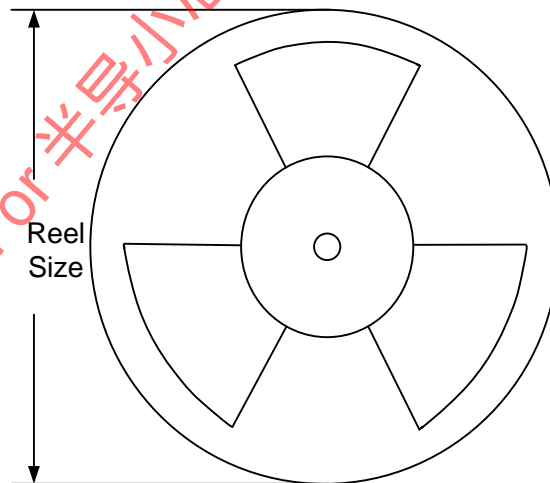
**Notes: All dimension in millimeter and exclude mold flash & metal burr.**

## Taping & Reel Specification

### 1. QFN1.5x1.5 taping orientation



### 2. Carrier Tape & Reel specification for packages



Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer length(mm)	Leader length (mm)	Qty per reel
QFN1.5x1.5	8	4	7"	400	160	3000

### 3. Others: NA

单击下面可查看定价，库存，交付和生命周期等信息

[>>SILERGY\(矽力杰\)](#)