

## High Efficiency 6.5V, 2A continuous, 3A peak, 1MHz Synchronous Step Down Regulator

### General Description

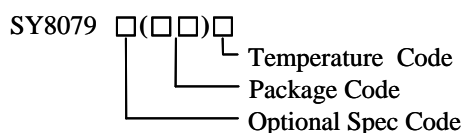
The SY8079 is a high-efficiency, high frequency synchronous step-down DC-DC regulator IC capable of delivering up to 2A output current. The SY8079 operates over a wide input voltage range from 2.7V to 6.5V and integrates main switch and synchronous switch with very low  $R_{DS(ON)}$  to minimize the conduction loss.

Low output voltage ripple and small external inductor and capacitor sizes are achieved with greater than 1MHz switching frequency.

### Features

- Low  $R_{DS(ON)}$  for internal switches (top/bottom):125m $\Omega$ /95m $\Omega$
- 2.7-6.5V input voltage range
- 2A continuous, 3A peak load current capability
- 1MHz switching frequency minimizes the external components
- Internal softstart limits the inrush current
- 100% dropout operation
- RoHS Compliant and Halogen Free
- Compact package: SOT23-5

### Ordering Information



### Applications

- LCD TV
- Set Top Box
- Net PC
- Mini-Notebook PC
- Access Point Router

Ordering Number	Package type	Note
SY8079AAC	SOT23-5	

### Typical Applications

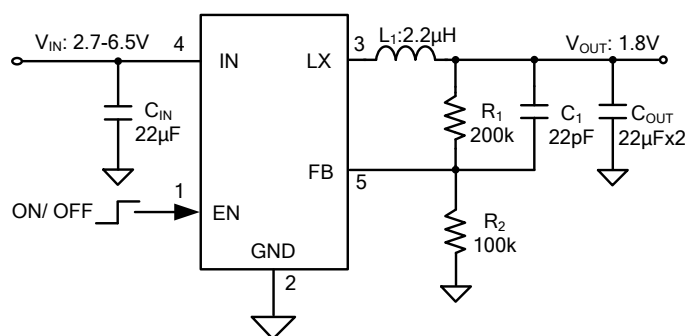


Figure 1. Schematic diagram

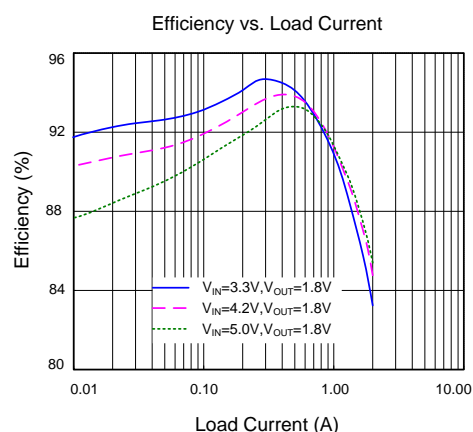
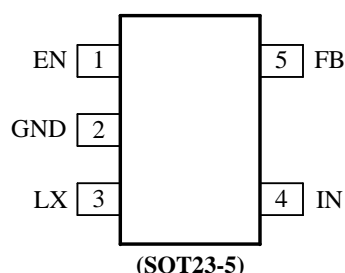


Figure 2. Efficiency vs Load Current

## Pinout (top view)



**Top Mark:** UHxyz (device code: UH, x=year code, y=week code, z= lot number code)

Pin Name	Pin Number	Pin Description
EN	1	Enable control. Pull high to turn on. Do not float.
GND	2	Ground pin.
LX	3	Inductor pin. Connect this pin to the switching node of inductor.
IN	4	Input pin. Decouple this pin to GND pin with at least 10 $\mu$ F ceramic cap.
FB	5	Output Feedback Pin. Connect this pin to the center point of the output resistor divider (as shown in Figure 1) to program the output voltage: $V_{out}=0.6*(1+R_1/R_2)$ .

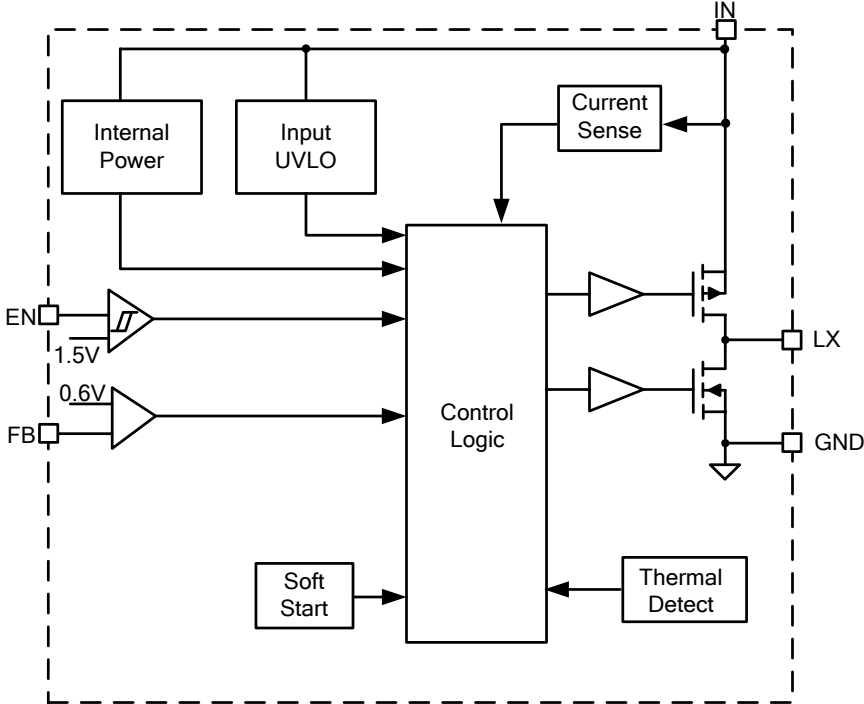
## Absolute Maximum Ratings (Note 1)

Supply Input Voltage-----	-0.3V to 7.0V
LX Voltage-----	-0.3V <sup>(*1)</sup> to 7V <sup>(*2)</sup>
All other pins-----	-0.3V to 7.0V
Power Dissipation, P <sub>D</sub> @ T <sub>A</sub> = 25 °C, SOT23-5 -----	0.6W
Package Thermal Resistance (Note 2)	
$\theta_{JA}$ -----	170 °C/W
$\theta_{JC}$ -----	130 °C/W
Junction Temperature Range -----	-40 °C to 150 °C
Lead Temperature (Soldering, 10 sec.) -----	260 °C
Storage Temperature Range -----	-65 °C to 150 °C
(*1) LX Voltage tested down to -3V<10ns	
(*2) LX Voltage tested up to +7.5V<50ns	

## Recommended Operating Conditions (Note 3)

Supply Input Voltage -----	2.7V to 6.5V
Enable, FB Voltage -----	V <sub>IN</sub> +0.3V
Junction Temperature Range -----	-40 °C to 125 °C
Ambient Temperature Range -----	-40 °C to 85 °C

Block Diagram



## Electrical Characteristics

( $V_{IN} = 5V$ ,  $V_{OUT} = 2.5V$ ,  $L = 2.2\mu H$ ,  $C_{OUT} = 22\mu F$ ,  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

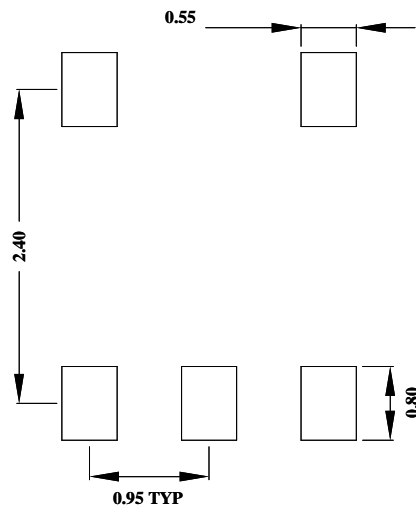
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	$V_{IN}$		2.7		6.5	V
Quiescent Current	$I_Q$	$I_{OUT}=0$ , $V_{FB}=V_{REF} \cdot 105\%$		55		$\mu A$
Shutdown Current	$I_{SHDN}$	EN=0		0.1	1	$\mu A$
Feedback Reference Voltage	$V_{REF}$		0.588	0.6	0.612	V
PFET RON	$R_{DS(ON),P}$			125		m $\Omega$
NFET RON	$R_{DS(ON),N}$			95		m $\Omega$
PFET Current Limit	$I_{LIM}$		3.5			A
EN rising threshold	$V_{ENH}$		1.5			V
EN falling threshold	$V_{ENL}$				0.4	V
Input UVLO threshold	$V_{UVLO}$				2.65	V
UVLO hysteresis	$V_{HYS}$			0.2		V
Oscillator Frequency	$F_{OSC}$	$I_{OUT}=500mA$		1		MHz
Short Circuit Protection Threshold	$V_{SCP}$			0.3		V
Min ON Time				75		ns
Max Duty Cycle			100			%
Soft Start Time	$T_{SS}$			1.0		ms
Output Discharge Switch On Resistance	$R_{DISCH}$			50		$\Omega$
Thermal Shutdown Temperature	$T_{SD}$			150		$^\circ\text{C}$

**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.

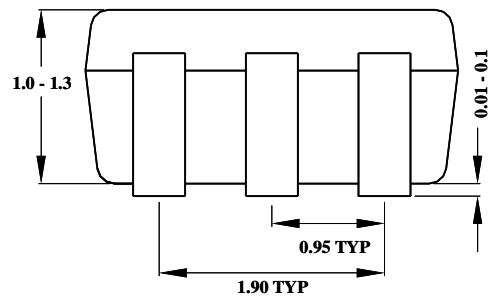
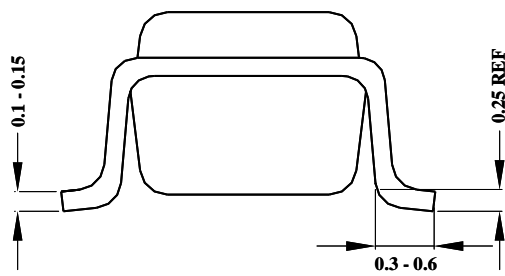
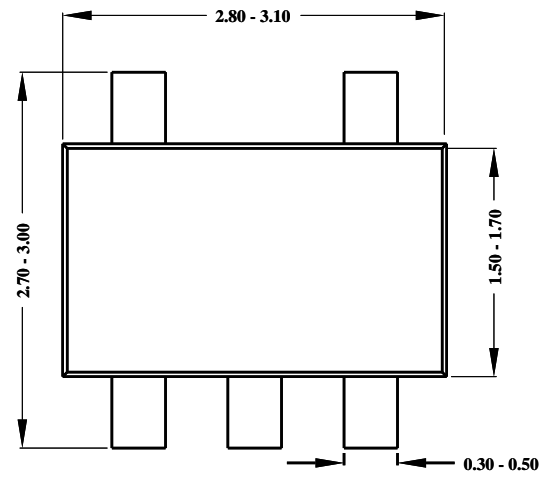
**Note 2:** Test condition: Device mounted on 2” x 2” FR-4 substrate PCB, 2oz copper, with minimum recommended pad on top layer and thermal vias to bottom layer ground plane.

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

**SOT23-5 Package outline & PCB layout design**



**Recommended Pad Layout**

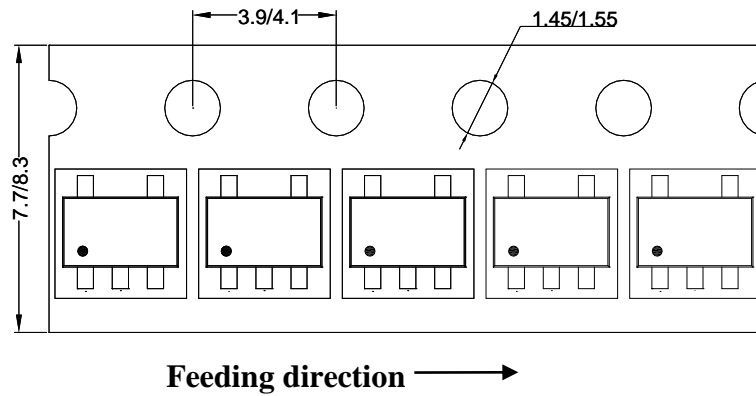


**Notes: All dimensions are in millimeters.  
All dimensions don't include mold flash & metal burr.**

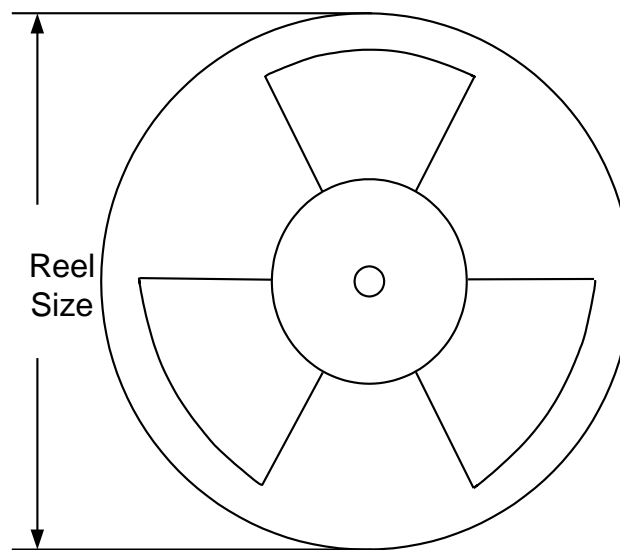
**Taping & Reel Specification**

**1. Taping orientation**

SOT23-5



**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
SOT23-5	8	4	7"	280	160	3000

**3. Others: NA**