SY7071A

0.7V Minimum Input and Fixed Output 100mA Maximum Output Current Synchronous Boost

General Description

The SY7071A is a high efficiency, synchronous, current hysteresis control; step-up boost converter designed for single-cell or dual-cell alkaline, NiMH, or NiCd battery-powered applications. It can convert down to 0.7V input voltage. It adopts NMOS for the main switch and PMOS for the synchronous switch.

Ordering Information

SY7071 □(□□)□

- Temperature Code
- Package Code
- Optional Spec Code

Ordering Number	Package type	Note
SY7071AAHC	SOT-363	

Features

- 0.7V Minimum Input Voltage
- 7μA Typical Quiescent Current
- Input Under-voltage Lockout
- Pass-through Function During Shutdown
- Low $R_{DS(ON)}$ (Main Switch/Synchronous Switch) at Output: 0.4/0.5Ω
- Fixed 5V Output Voltage
- Typical 350mA Peak Current Limit
- Compact SOT-363(SC70) Package
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Applications

- Battery Powered Applications
- Consumer And Portable Medical Products
- Personal Care Products
- Smart Phones
- White or Status LEDs

Typical Applications

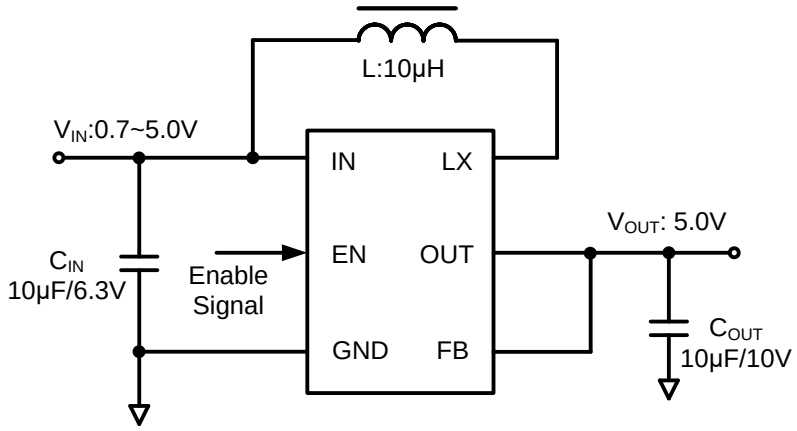
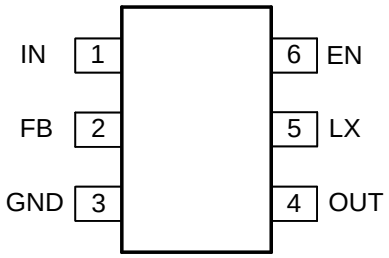


Figure 1. Schematic Diagram

Pinout (top view)



(SOT-363)

Top mark: **Af *xyz*** (Device code: Af, ***x=year code, y=week code, z= lot number code***)

Name	Number	Description
IN	1	Input pin. Decouple this pin to the GND pin with a 10µF ceramic capacitor.
FB	2	Feedback pin. Connected to the OUT pin for 5V output voltage.
GND	3	Ground pin.
OUT	4	Output pin. Decouple this pin to the GND pin with a minimum of 10µF ceramic capacitor.
LX	5	Inductor node. Connect an inductor between the IN pin and the LX pin.
EN	6	Enable pin. Pull it high to turn on or pull it low to shut down the part. Do not leave it floating.

Absolute Maximum Ratings (Note 1)

All Pins to GND---------- 6V
Power Dissipation, P_D @ T_A = 25°C SOT-363---------- 0.6W
Package Thermal Resistance (Note 2)
θ_{JA} ---------- 161°C/W
θ_{JC} ---------- 130°C/W
Junction Temperature Range ---------- 150°C
Lead Temperature (Soldering, 10 sec.) ---------- 260°C
Storage Temperature Range ---------- -65°C to 150°C

Recommended Operating Conditions (Note 3)

IN ---------- 0.7V to 5.0V
EN ---------- 0V to V_{OUT}+0.3V
All other pins ---------- 0-5.0V
Junction Temperature Range ---------- -40°C to 125°C
Ambient Temperature Range ---------- -40°C to 85°C

Electrical Characteristics

(V_{IN} =2.5V, V_{OUT}=5V, I_{OUT}=10mA, T_A = 25°C unless otherwise specified)

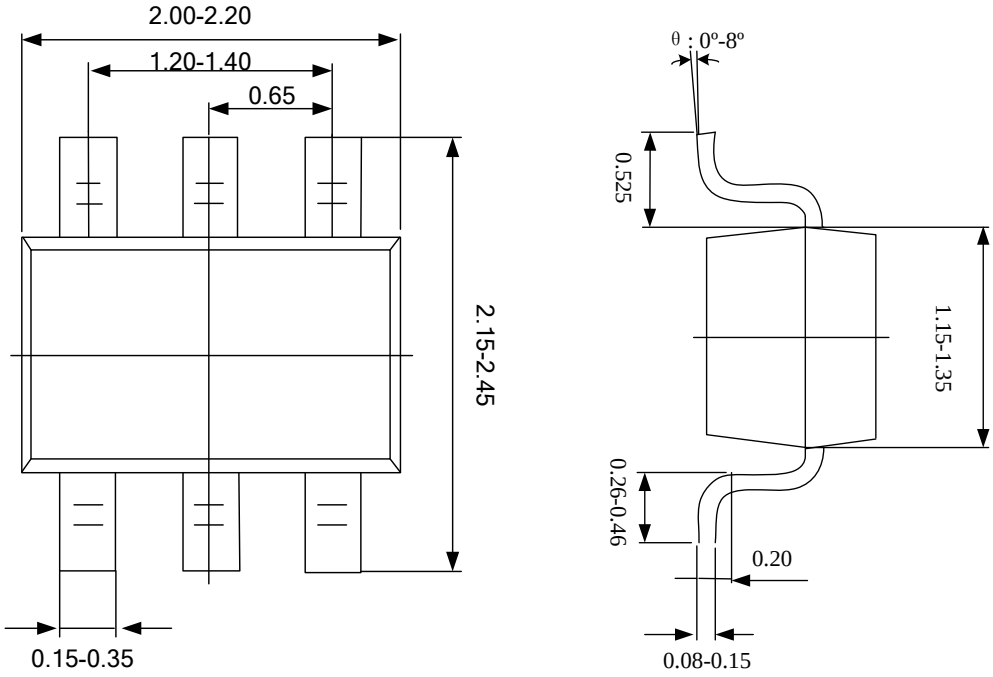
Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage		V_{IN}		0.7		5.0	V
Minimum V_{IN} at start-up		V_{START}			0.75		V
Output Voltage Range		V_{OUT}		4.85	5	5.15	V
Quiescent Current	V_{IN}	I_Q	Io=0mA,V_{EN}=V_{IN}=1.2V,		0.5		μA
	V_{OUT}		V_{OUT}=5.1V		7		
Shut Down Current		I_{SHDN}	V_{EN}=0V, V_{IN}=3.0V			1	μA
EN Rising Threshold		V_{ENH}	V_{IN}≤1.6	0.75xV_{IN}			V
			1.6<V_{IN}<5.0	1.2			V
EN Falling Threshold		V_{ENL}	V_{IN}≤1.6			0.2×V_{IN}	V
			1.6<V_{IN}<5.0			0.32	V
Low Side Main FET R_{ON}		$R_{DS(ON)1}$	V_{OUT}=5V		0.4		Ω
Synchronous FET R_{ON}		$R_{DS(ON)2}$	V_{OUT}=5V		0.5		Ω
Main FET Current Limit		I_{LIM}		300	350		mA
Output Over Voltage Protection		V_{OVP}			5.8	6	V
Thermal Shutdown Temperature		T_{SD}			150		℃
Thermal Shutdown Hysteresis		T_{HYS}			20		℃
Under Voltage Lockout For Turn off Protection		V_{UVLO}	V_{IN} decreasing		0.6		V

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.

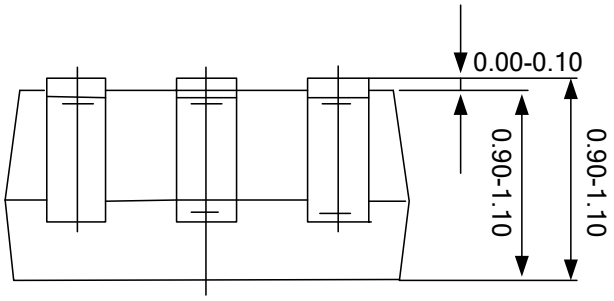
Note 2: θJA is measured in the natural convection at T_A = 25°C on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard. Test condition: Device mounted on 2" x 2" FR-4 substrate PCB, 2oz copper, with minimum recommended pad on top layer and thermal vias to bottom layer ground plane.

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

SOT-363(SC70) Package outline



Recommended Pad Layout



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