



SILERGY

SY8493

High Efficiency, 60V Input, 3A Asynchronous Step Down Regulator

General Description

The SY8493 develops a high efficiency, current mode adaptive constant off time controlled, asynchronous step-down DC/DC converter capable of delivering 3A output current. The SY8493 operates over a wide input voltage range from 4.5V to 60V and integrates main switch with very low $R_{DS(ON)}$ to minimize the conduction loss. The switching frequency is adjustable from 100kHz to 500kHz using an external resistor. And the device features cycle-by-cycle peak current limitation.

Ordering Information

SY8493 □(□□)□
Temperature Code
Package Code
Optional Spec Code

Ordering Number	Package type	Note
SY8493FCC	SO8E	--

Features

- Low $R_{DS(ON)}$ for Internal N-channel Power FET(TOP):150mΩ
- 4.5-60V Input Voltage Range
- 3A Output Current Capability
- Adjustable Switching Frequency Range: 100kHz to 500kHz
- Internal Soft-start Limits the Inrush Current
- Hic-cup Mode Output Short Circuit Protection
- EN ON/OFF Control with Accurate Threshold
- Cycle-by-cycle Peak Current Limit
- $0.8V \pm 1\%$ Reference Voltage Accuracy
- Compact Package: SO8E

Applications

- Non-isolated Telecommunication Buck Regulator
- Secondary High Voltage Post Regulator
- Automotive Systems
- Electric Bicycle

Typical Applications

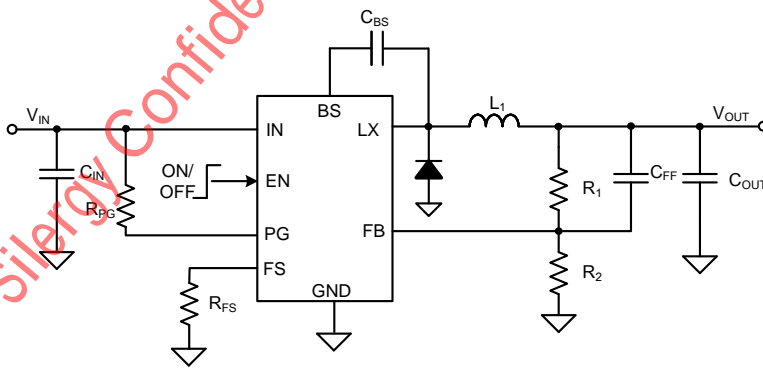


Figure1. Schematic Diagram

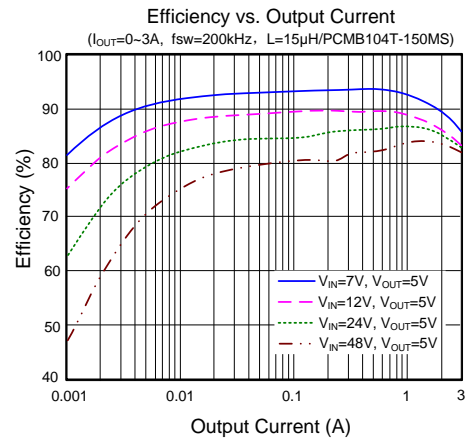
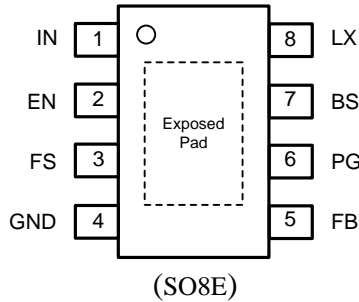


Figure2. Efficiency vs. Output Current

Pinout (top view)



Top Mark: DHAxzy (Device code: DHA; x=year code, y=week code, z=lot number code)

Pin Name	Pin Number	Pin Description
IN	1	Input pin. Decouple this pin to the GND pin with at least a 1μF ceramic capacitor.
EN	2	Enable control. Pulled high to turn on. Do not leave it floating.
FS	3	Frequency programming pin. Connect a resistor to ground to program a switching frequency between 100kHz to 500kHz. The switching frequency equals to: $f_{sw}(kHz)=10^5/R_{FS}(k\Omega)$
GND	4	Ground pin
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: $V_{OUT}=0.8 \times (1+R_1/R_2)$.
PG	6	Power good Indicator. Open-drain output when the output voltage is within 90% to 120% of the regulation point.
BS	7	Boot-strap pin. Supply high side gate driver. Connect a 0.1μF ceramic capacitor between the BS pin and the LX pin.
LX	8	Inductor pin. Connect this pin to the switching node of the inductor.
Exposed Pad	/	Exposed pad must be connected to the GND pin. Connect to system ground plane on application board for optimal thermal performance.

Block Diagram

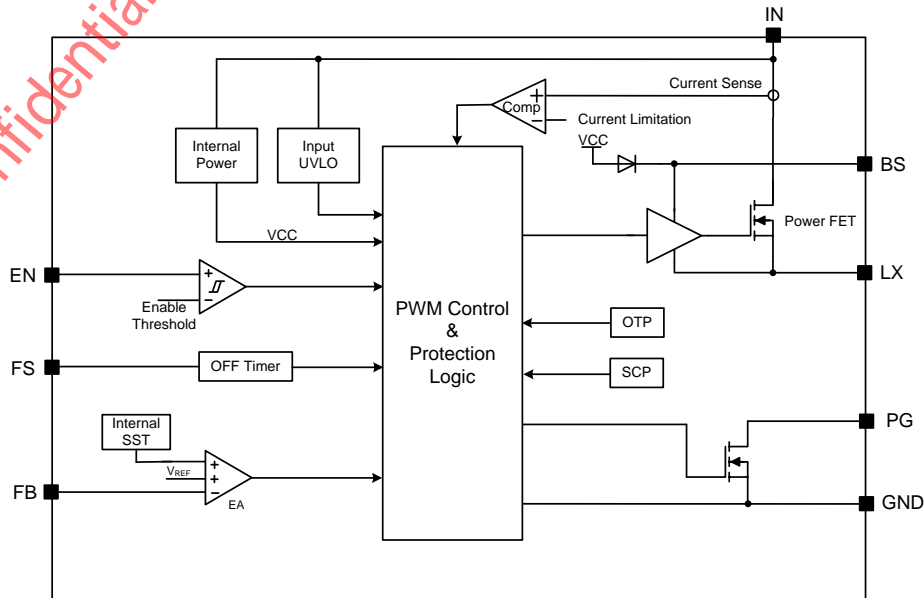


Figure3. Block Diagram



Absolute Maximum Ratings (Note 1)

Supply Input Voltage	-----	-0.3V to 66V
BS-LX Voltage	-----	-0.3V to 6V
EN, FS, FB, PG, LX Voltage	-----	-0.3V to $V_{IN} + 0.3V$
Power Dissipation, P_D @ $T_A = 25^\circ C$, SO8E	-----	2.38W
Package Thermal Resistance (Note 2)		
θ_{JA}	-----	42°C/W
θ_{JC}	-----	4°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
Dynamic LX voltage in 10 ns duration	-----	$V_{IN} + 3V$ to GND-5V

Recommended Operating Conditions (Note 3)

Supply Input Voltage	-----	4.5V to 60V
Junction Temperature Range	-----	-40°C to 125°C
Ambient Temperature Range	-----	-40°C to 85°C

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Electrical Characteristics

($V_{IN}=24V$, $V_{OUT}=5V$, $L=6.8\mu H$, $C_{OUT}=22\mu F$, $T_A=25^\circ C$, $I_{OUT}=1A$ unless otherwise specified)

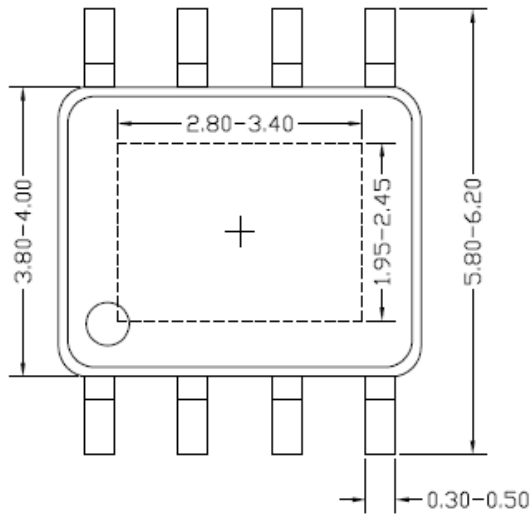
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	V_{IN}		4.5		60	V
Input UVLO Threshold	V_{UVLO}		3.9	4.2	4.5	V
Input UVLO Hysteresis	V_{HYS}		0.19	0.27	0.35	V
Quiescent Current	I_Q	$V_{FB}=V_{REF}\times 105\%$	70	100	130	μA
Shutdown Current	I_{SHDN}	$V_{EN}=0V$	2	6	16	μA
Feedback Reference Voltage	V_{REF}		792	800	808	mV
FB Input Current	I_{FB}	$V_{FB}=3.3V$	-50		50	nA
Top FET R_{ON}	$R_{DS(ON)}$		120	150	180	m Ω
EN Rising Threshold	$V_{EN,R}$		1	1.1	1.2	V
EN Falling Threshold	$V_{EN,F}$		0.8	0.9	1	V
EN Leakage Current	I_{EN}		-1		1	μA
Min ON Time	$t_{ON,MIN}$			150		ns
Min OFF Time	$t_{OFF,MIN}$			250		ns
Soft-start Time	t_{SS}			2		ms
Switching Frequency Program Range	$f_{SW,RNG}$	$R_{ES}=200k\sim 1M$	100		500	kHz
Switching Frequency Setting Accuracy	f_{SW}	$R_{OSC}=200k$	400	500	600	kHz
Power Good Threshold	V_{PG}	V_{FB} falling, PG from high to low	87	90	94	% V_{REF}
		V_{FB} rising, PG from low to high	91	95	98	% V_{REF}
		V_{FB} rising, PG from high to low	115	120	123	% V_{REF}
		V_{FB} falling, PG from low to high	111	115	118	% V_{REF}
Power Good Delay	$t_{PG,F}$	High to low		20		μs
	$t_{PG,R}$	Low to high		200		μs
Power Good Output Low	$V_{PG,L}$	$I_{PG}=2mA$			0.3	V
PG High Leakage Current					1	μA
Top FET Current Limit	$I_{LMT,RNG}$		3.8	4.5	5	A
Output Under Voltage Protection Threshold	V_{UVP}		45	50	55	% V_{REF}
Output UVP Delay	$t_{UVP,DLY}$			10		μs
UVP Hiccup ON Time	$t_{UVP,ON}$			3		ms
UVP Hiccup OFF Time	$t_{UVP,OFF}$			20		ms
Thermal Shutdown Temperature	T_{SD}			150		$^\circ C$
Thermal Shutdown Hysteresis	T_{HYS}			15		$^\circ C$

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

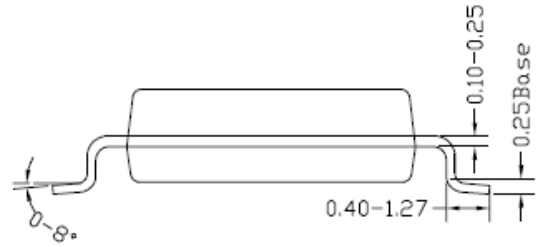
Note 2: θ_{JA} is measured in the natural convection at $T_A = 25^\circ C$ on a two-layer Silergy demo board.

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

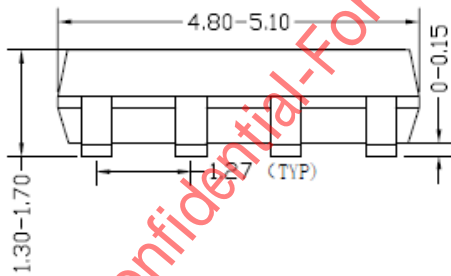
SO8E Package Outline & PCB Layout



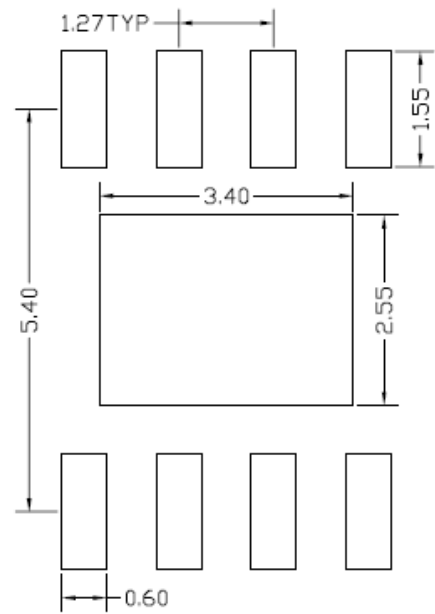
Top view



Side view



Front view



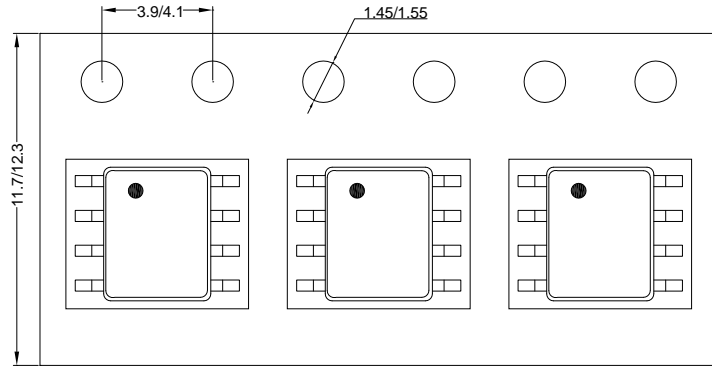
**Recommended PCB layout
(Reference Only)**

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

Taping & Reel Specification

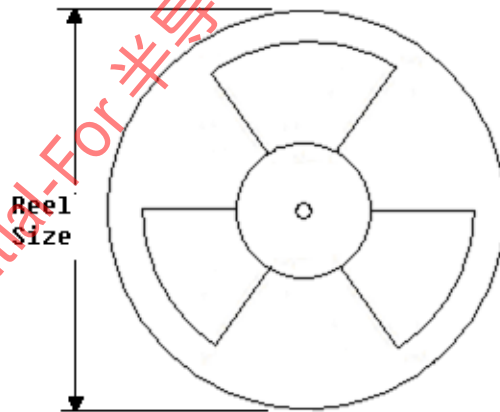
1. Taping orientation

SO8E



Feeding direction →

2. Carrier Tape & Reel specification for packages



Package type	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer length(mm)	Leader length (mm)	Qty per reel
SO8E	12	8	13"	400	400	2500

3. Others: NA

单击下面可查看定价，库存，交付和生命周期等信息

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