

SY8200


High Efficiency Fast Response, 0.6A, 24V Input Synchronous Step Down Regulator *Preliminary Specification*

General Description

SY8200 develops high efficiency synchronous step-down DC-DC converter capable of delivering 0.6A . SY8200 operates over a wide input voltage range from 6V to 24V and integrate main switch and synchronous switch with very low $R_{DS(ON)}$ to minimize the conduction loss.

SY8200 adopts the instant PWM architecture to achieve fast transient responses for high step down applications and high efficiency at light loads. In addition, it operates at pseudo-constant frequency of 500 kHz under heavy load conditions to minimize the size of inductor and capacitor.

Ordering Information

SY8200 
Temperature Code
Package Code
Optional Spec Code

Temperature Range: -40°C to 85°C

Ordering Number	Package type	Note
SY8200ABC	SOT23-6	--

Features

- Low $R_{DS(ON)}$ for internal switches (top/bottom):420/200 m Ω
- 6-24V input voltage range
- Instant PWM architecture to achieve fast transient responses Internal softstart limits the inrush current
- 2% 0.6V reference
- RoHS Compliant and Halogen Free
- Compact package: SOT23-6 pin

Applications

- Set Top Box
- Portable TV
- Access Point Router
- DSL Modem
- LCD TV

Typical Applications

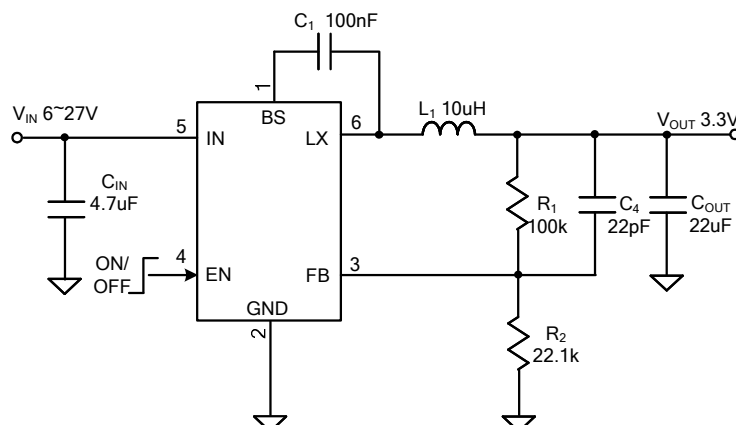
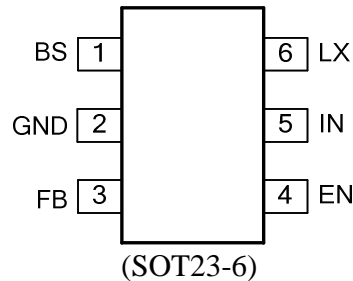


Figure 1. Schematic Diagram

Pinout (top view)



Top Mark: **FLxyz**, (Device code: FL, etc.; *x*=year code, *y*=week code, *z*=lot number code)

Pin Name	Pin Number	Pin Description
BS	1	Boot-Strap Pin. Supply high side gate driver. Decouple this pin to LX pin with 0.1uF ceramic cap.
GND	2	Ground pin
FB	3	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: $V_{out}=0.6*(1+R1/R2)$
EN	4	Enable control. Pull high to turn on. Do not float.
IN	5	Input pin. Decouple this pin to GND pin with at least 1uF ceramic cap
LX	6	Inductor pin. Connect this pin to the switching node of inductor

Absolute Maximum Ratings (Note 1)

Supply Input Voltage	-----	27V
LX, EN Voltage	-----	$V_{IN} + 0.3V$
FB, BS-LX Voltage	-----	4V
Power Dissipation, P_D @ $T_A = 25^\circ C$ SOT23-6,	-----	0.6W
Package Thermal Resistance (Note 2)		
θ_{JA}	-----	200°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)

Supply Input Voltage	-----	6V to 24V
Junction Temperature Range	-----	-40°C to 125°C
Ambient Temperature Range	-----	-40°C to 85°C

Electrical Characteristics

($V_{IN} = 12V$, $V_{OUT} = 1.2V$, $L = 2.2\mu H$, $C_{OUT} = 10\mu F$, $T_A = 25^\circ C$, $I_{OUT} = 0.6A$ unless otherwise specified)

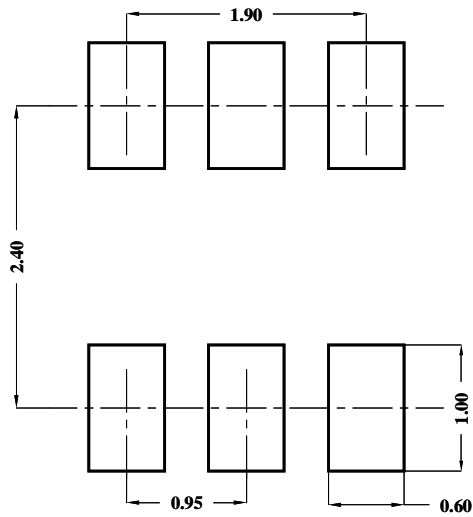
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	V_{IN}		6		24	V
Quiescent Current	I_Q	$I_{OUT}=0$, $V_{FB}=V_{REF}\times 105\%$		400		μA
Shutdown Current	I_{SHDN}	EN=0		5	10	μA
Feedback Reference Voltage	V_{REF}		0.588	0.6	0.612	V
FB Input Current	I_{FB}	$V_{FB}=V_{IN}$	-50		50	nA
Top FET RON	$R_{DS(ON)1}$			0.42		Ω
Bottom FET RON	$R_{DS(ON)2}$			0.2		Ω
Bottom FET Valley Current Limit	I_{LIM}		0.8			A
EN Rising Threshold	V_{ENH}		1.5			V
EN Falling Threshold	V_{ENL}				0.4	V
Input UVLO Threshold	V_{UVLO}				4.5	V
UVLO Hysteresis	V_{HYS}			0.4		V
On Time	T_{ON}	$V_{IN} = 12V$, $V_{OUT}=1.2V$, $I_{OUT} = 0.6A$		200		ns
Min ON Time				50		ns
Min Off Time				100		ns
Thermal Shutdown Temperature	T_{SD}			150		C
Thermal Shutdown Hysteresis	T_{HYS}			15		C

Note 1: Stresses listed as the above “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 for extended periods may remain possibility to affect device reliability.

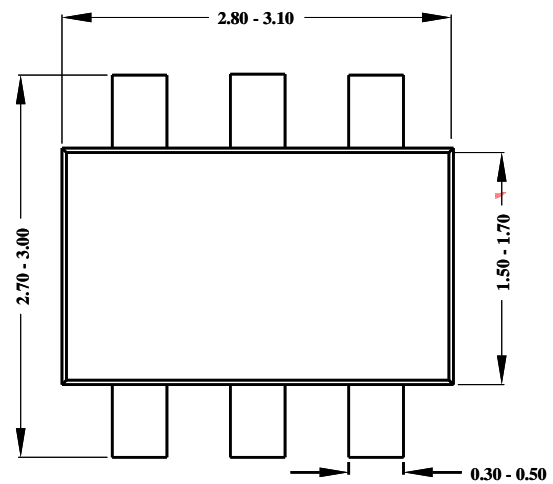
Note 2: θ_{JA} is measured in the natural convection at $T_A = 25^\circ C$ on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard. Pin 2 of SOT-23-6 packages is the case position for θ_{JC} measurement.

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

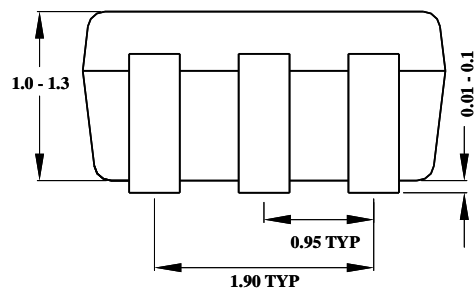
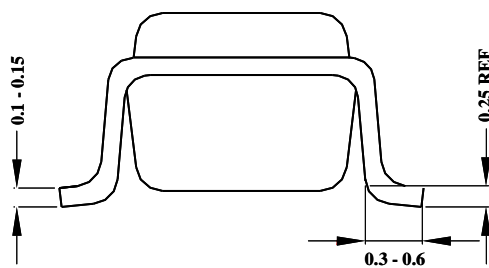
SOT23-6 Package Outline & PCB layout



Recommended Pad Layout



Top View



Notes: All dimension in MM
 All dimension do not include mold flash & metal burr