



General Description

SY7201 is a DC/DC step-up converter that delivers an accurate constant current for driving LEDs. Operation at a fixed switching frequency of 1MHz allows the device to be used with small value external ceramic capacitors and inductor. LEDs connected in series are driven with a regulated current set by the external resistor. The SY7201 is ideal for driving up to eight white LEDs in series or up to 30V.

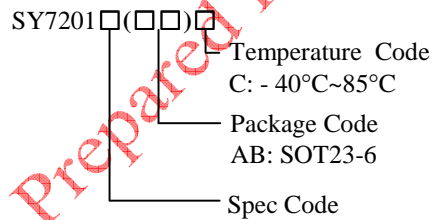
Features

- Input voltage range 2.5V to 9V
- Switch current limit 2A
- Drives LED strings up to 30V
- 1MHz fixed frequency minimizes the external components
- Internal softstart limits the inrush current
- Open LED overvoltage protection
- RoHS Compliant and Halogen Free
- Compact package: SOT23-6 pin

Applications

- GPS Navigation Systems
- Handheld Devices
- Portable Media Players

Ordering Information



Typical Applications

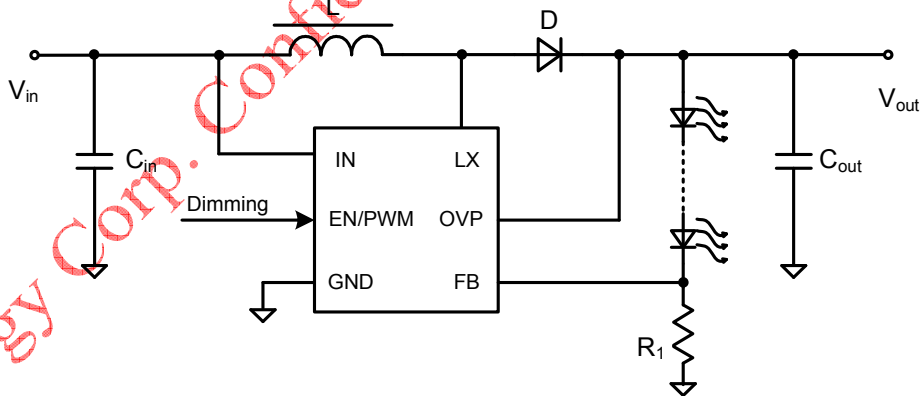
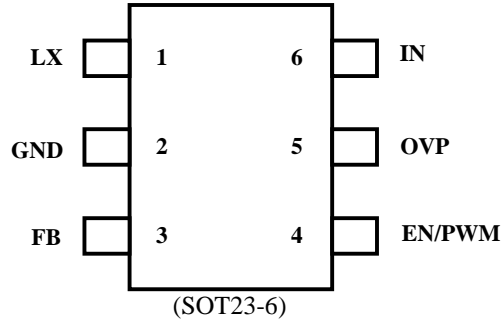


Figure 1. Schematic Diagram

Pinout (top view)


Top Mark: DQxyz (Device code: DQ, *x*=year code, *y*=week code, *z*=lot number code)

| Pin Name | Pin Number | Pin Description |
|----------|------------|--|
| LX | 1 | Inductor node. Connect an inductor between IN pin and LX pin. |
| GND | 2 | Ground pin. |
| FB | 3 | Feedback pin. Connect a resistor R1 between FB and GND to program the output current: $I_{OUT}=0.2V/R_1$. |
| EN/PWM | 4 | Enable and dimming control. The recommended PWM frequency should be higher than 20kHz. |
| OVP | 5 | Over voltage protection. The value is 33V. |
| IN | 6 | Input pin. Decouple this pin to GND pin with 1uF ceramic capacitor. |

Absolute Maximum Ratings (Note 1)

| | |
|---|----------------|
| IN, | 10V |
| LX, OVP | 36V |
| All other pins | 6V |
| Power Dissipation, P_D @ $T_A = 25^\circ\text{C}$, SOT23-6 | 0.4W |
| Package Thermal Resistance (Note 2) | |
| SOT23-6, θ_{JA} | 250°C/W |
| SOT23-6, 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 |
| ESD Susceptibility (Note 2) | |
| HBM (Human Body Mode) | 2kV |
| MM (Machine Mode) | 200V |

Recommended Operating Conditions (Note 3)

| | |
|----------------------------------|----------------|
| IN, | 2.5V to 9V |
| LX, OVP | 2.5V to 30V |
| All other pins | 0 to 3.6V |
| Junction Temperature Range | -40°C to 125°C |
| Ambient Temperature Range | -40°C to 85°C |



Electrical Characteristics

($V_{IN} = 3.6V$, $T_A = 25^{\circ}C$, unless otherwise specified)

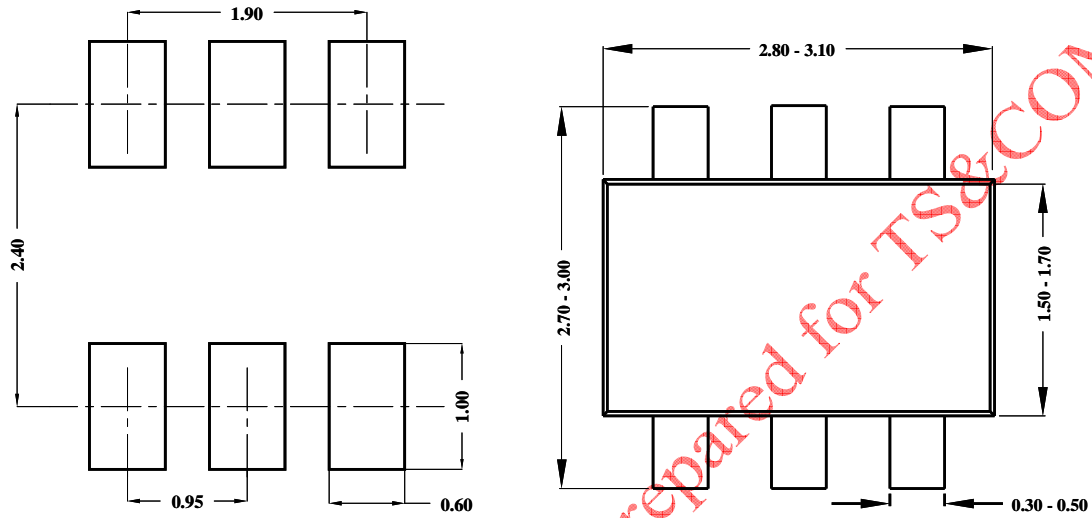
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|----------------------------|--------------|-----------------|-----|-----|-----|------|
| Input Voltage Range | V_{IN} | | 2.5 | | 9.0 | V |
| Quiescent Current | I_Q | FB=0.3V | | 0.1 | 0.6 | mA |
| Shutdown Current | I_{SHDN} | EN=0 | | 10 | 15 | uA |
| Feedback Reference Voltage | V_{REF} | | 196 | 200 | 204 | mV |
| FB Input Current | I_{FB} | FB=0.3V | | | 1 | uA |
| Low Side Main FET RON | $R_{DS(ON)}$ | | | 200 | | mΩ |
| Main FET Current Limit | I_{LIM} | | 2 | | | A |
| EN Rising Threshold | V_{ENH} | | 1.5 | | | V |
| EN Falling Threshold | V_{ENL} | | | | 0.4 | V |
| Input UVLO threshold | V_{UVLO} | | | | 2.4 | V |
| UVLO hysteresis | V_{HYS} | | | 0.1 | | V |
| Oscillator Frequency | F_{OSC} | $I_{OUT}=100mA$ | | 1.0 | | MHz |
| Min On Time | | | | 100 | | ns |
| Max Duty Cycle | | | | 90 | | % |
| Thermal Shutdown | T_{SD} | | | 150 | | °C |
| Thermal Hysteresis | T_{HYST} | | | 20 | | °C |
| Output Clamp voltage | V_{OCL} | “Open LED” | | 33 | | V |

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.

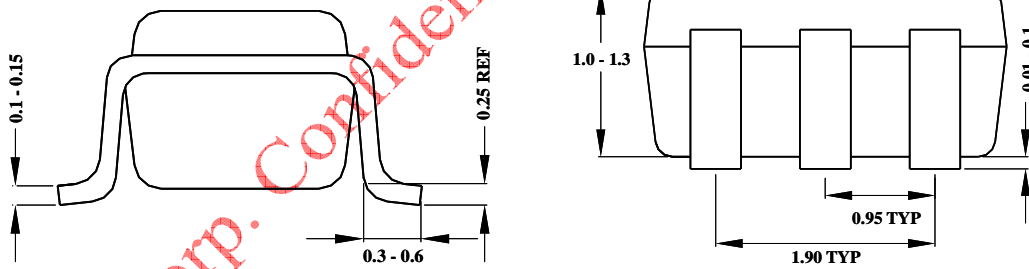
Note 2: θ_{JA} is measured in the natural convection at $T_A = 25^{\circ}C$ on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard. Pin 2 of SOT23-6 packages is the case position for θ_{JC} measurement.

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

SOT23-6 Package outline & PCB layout design



Recommended Pad Layout



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

www.s-manuals.com