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# SI-3000LLSL Series Surface-Mount, Low Current Consumption, Low Dropout Voltage

## ■ Features

- Low input voltage (1.3V) and low output voltage (1.0V)
- Compact surface-mount package (SOP8)
- Low dropout voltage:  $V_{DIF} \leq 0.3V$  (at  $I_o = 1.5A$ )
- Built-in overcurrent, input-overvoltage and thermal protection circuits
- Built-in ON/OFF function (OFF state circuit current:  $1\mu A$  max.)
- Compatible with low ESR capacitors

## ■ Absolute Maximum Ratings

(T<sub>a</sub>=25°C)

Parameter	Symbol	Rated	Unit
DC Input Voltage	V <sub>IN</sub>	10	V
DC Bias Voltage	V <sub>B</sub>	10	V
Output Control Terminal Voltage	V <sub>C</sub>	V <sub>IN</sub>	V
DC Output Current	I <sub>O</sub>	1.5	A
Power Dissipation	P <sub>D</sub> <sup>*1</sup>	1.1	W
Junction Temperature	T <sub>J</sub>	-30 to +125	°C
Operating Ambient Temperature	T <sub>OP</sub>	-30 to +100	°C
Storage Temperature	T <sub>STG</sub>	-30 to +125	°C
Thermal Resistance (Junction to Lead (Pin 8))	θ <sub>(j-l)</sub>	36	°C/W
Thermal Resistance (Junction to Ambient Air)	θ <sub>(j-a)</sub> <sup>*1</sup>	100	°C/W

\*1: When mounted on glass-epoxy board of 40 × 40mm (copper laminate area 100%).

## ■ Applications

- On-board local power supply
- For stabilization of the secondary-side output voltage of switching power supplies

## ■ Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		SI-3010LLSL		
Input Voltage	V <sub>IN</sub>	1.4 to 3.6 <sup>*1</sup>		V
Bias Voltage	V <sub>B</sub>	3.3 to 5.5		V
Output Current	I <sub>O</sub>	0 to 1.5 <sup>*1</sup>		A
Operating Ambient Temperature	T <sub>OP</sub>	-20 to +85 <sup>*1</sup>		°C

\*1: V<sub>IN</sub> (max) and I<sub>O</sub> (max) are restricted by the relation P<sub>D</sub> = (V<sub>IN</sub> - V<sub>O</sub>) × I<sub>O</sub>.

## ■ Electrical Characteristics

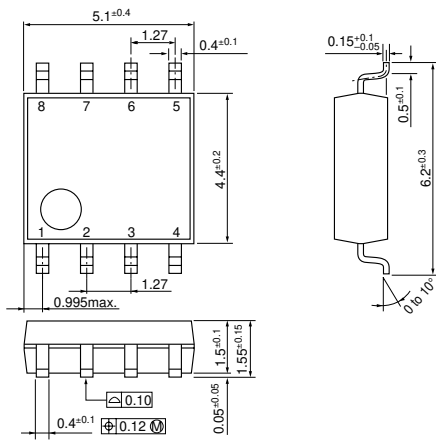
(T<sub>a</sub>=25°C, V<sub>C</sub>=2V, V<sub>IN</sub>=1.8V, V<sub>B</sub>=3.3V, V<sub>O</sub>=1.5V, unless otherwise specified)

Parameter	Symbol	Ratings			Unit	
		SI-3010LLSL				
		min.	typ.	max.		
Reference Voltage	V <sub>ADJ</sub>	0.980	1.000	1.020	V	
	Conditions	I <sub>O</sub> =10mA				
Line Regulation	ΔV <sub>OLINE</sub>			10	mV	
	Conditions	V <sub>IN</sub> =1.7 to 2.5V, I <sub>O</sub> =10mA				
Load Regulation	ΔV <sub>OLOAD</sub>			30	mV	
	Conditions	V <sub>IN</sub> =1.8V, I <sub>O</sub> =0 to 1.5A				
Dropout Voltage	V <sub>DIF</sub>			0.3	V	
	Conditions	I <sub>O</sub> =1.0A				
Quiescent Circuit Current	I <sub>q</sub>		500	800	μA	
	Conditions	I <sub>O</sub> =0A, R <sub>2</sub> =10kΩ				
Circuit Current at Output OFF	I <sub>q</sub> (OFF)			1	μA	
	Conditions	V <sub>C</sub> =0V				
Temperature Coefficient of Output Voltage	ΔV <sub>O</sub> /ΔT <sub>a</sub>		±0.2		mV/°C	
	Conditions	T <sub>J</sub> =0 to 100°C				
Overcurrent Protection Starting Current <sup>*1</sup>	I <sub>S1</sub>	1.6			A	
	Conditions	V <sub>IN</sub> =1.8V, V <sub>B</sub> =3.3V				
V <sub>C</sub> Terminal	Control Voltage (Output ON) <sup>*2</sup>	V <sub>C</sub> , IH	2		V	
	Control Voltage (Output OFF)	V <sub>C</sub> , IL		0.8	V	
	Control Current (Output ON)	I <sub>C</sub> , IH			50	μA
	Control Current (Output ON)	Conditions	V <sub>C</sub> =2.7V			
	Control Current (Output OFF)	I <sub>C</sub> , IL			10	μA
Control Current (Output OFF)	Conditions	V <sub>C</sub> =0.4V				

\*1: I<sub>S1</sub> is specified at the 5% drop point of output voltage V<sub>O</sub> on the condition that V<sub>IN</sub> = overcurrent protection starting current, I<sub>O</sub> = 10 mA.\*2: Output is OFF when the output control terminal (V<sub>C</sub> terminal) is open. Each input level is equivalent to LS-TTL level. Therefore, the device can be driven directly by LS-TTLs.

External Dimensions (SOP8)

(unit : mm)

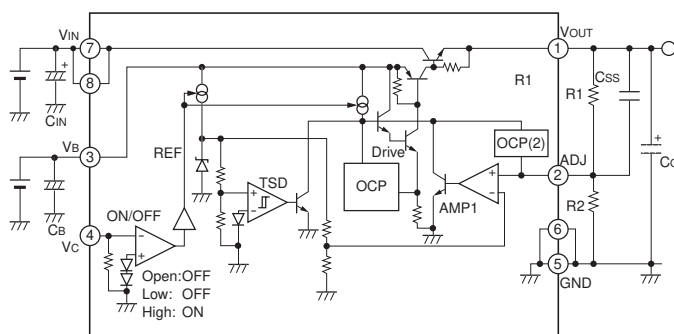


Pin Assignment

- ① Vo
- ② ADJ
- ③ Vb
- ④ Vc
- ⑤ GND
- ⑥ GND
- ⑦ Vin
- ⑧ Vin

Plastic Mold Package Type  
 Flammability: UL94V-0  
 Product Mass: Approx. 0.1g

Typical Connection Diagram/Block Diagram



C<sub>IN</sub>, C<sub>b</sub>: Input and bias capacitors (Approx. 0.1 to 10μF)  
 Required when the input line contains inductance or when the wiring is long.

C<sub>o</sub>: Output capacitor (47μF or larger)  
 SI-3010LLSL is designed to use a low ESR capacitor (such as a ceramic capacitor) for the output capacitor. The recommended ESR value for an output capacitor is 500mΩ or less (at room temperature).

R<sub>1</sub>, R<sub>2</sub>: Output voltage setting resistors  
 The output voltage can be set by connecting R<sub>1</sub> and R<sub>2</sub> as shown at left.  
 The recommended value for R<sub>2</sub> is 10kΩ.

$$R1 = (Vo - V_{ADJ}) / (V_{ADJ} / R2)$$

C<sub>SS</sub>: Soft start capacitor  
 The rising time of the output voltage can be set by connecting C<sub>SS</sub> between V<sub>OUT</sub> and ADJ.

Reference Data

