

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_a=25°C)

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V _{IN}	10	V
DC Bias Voltage	V _B	10	V
Output Control Terminal Voltage	V _C	V _{IN}	V
DC Output Current	I _O	1.5	A
Power Dissipation	P _D *1	1.1	W
Junction Temperature	T _J	-30 to +125	°C
Operating Ambient Temperature	T _{OP}	-30 to +100	°C
Storage Temperature	T _{stg}	-30 to +125	°C
Thermal Resistance (Junction to Lead (Pin 8))	θ _(J-L)	36	°C/W
Thermal Resistance (Junction to Ambient Air)	θ _(J-a) *1	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 _{IN}	1.4 to 3.6*1	V
Bias Voltage	V _B	3.3 to 5.5	V
Output Current	I _O	0 to 1.5*1	A
Operating Ambient Temperature	T _{OP}	-20 to +85*1	°C

*1: V_{IN} (max) and I_O (max) are restricted by the relation P_D = (V_{IN} - V_O) × I_O.

■Electrical Characteristics

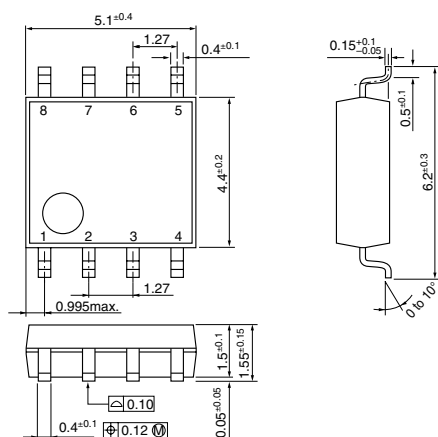
(T_a=25°C, V_C=2V, V_{IN}=1.8V, V_B=3.3V, V_O=1.5V, unless otherwise specified)

Parameter		Symbol	Ratings			Unit
			SI-3010LLSL			
			min.	typ.	max.	
Reference Voltage	V _{ADJ}	0.980	1.000	1.020	V	
	Conditions	I _O =10mA				
Line Regulation	ΔV _{OLINE}			10	mV	
	Conditions	V _{IN} =1.7 to 2.5V, I _O =10mA				
Load Regulation	ΔV _{OLOAD}			30	mV	
	Conditions	V _{IN} =1.8V, I _O =0 to 1.5A				
Dropout Voltage	V _{DIF}			0.3	V	
	Conditions	I _O =1.0A				
Quiescent Circuit Current	I _q		500	800	μA	
	Conditions	I _O =0A, R ₂ =10kΩ				
Circuit Current at Output OFF	I _q (OFF)			1	μA	
	Conditions	V _C =0V				
Temperature Coefficient of Output Voltage	ΔV _O /ΔT _a		±0.2		mV/°C	
	Conditions	T _J =0 to 100°C				
Overcurrent Protection Starting Current ¹	I _{S1}	1.6			A	
	Conditions	V _{IN} =1.8V, V _B =3.3V				
V _C Terminal	Control Voltage (Output ON) ²	V _C , I _H	2		V	
	Control Voltage (Output OFF)	V _C , I _L		0.8	V	
	Control Current (Output ON)	I _C , I _H		50	μA	
	Conditions	V _C =2.7V				
	Control Current (Output OFF)	I _C , I _L		10	μA	
	Conditions	V _C =0.4V				

*1: I_{S1} is specified at the 5% drop point of output voltage V_O on the condition that V_{IN} = overcurrent protection starting current, I_O = 10 mA.*2: Output is OFF when the output control terminal (V_C 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)

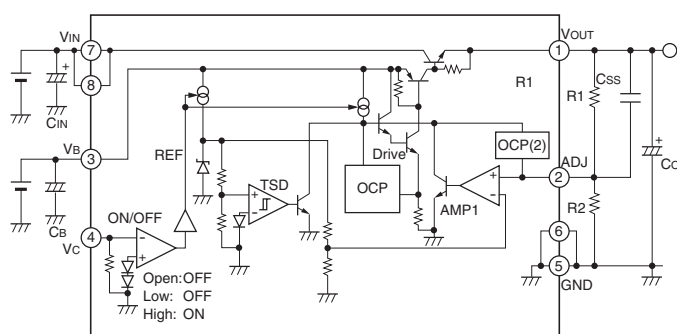


Pin Assignment

- ① V_O
- ② ADJ
- ③ V_B
- ④ V_C
- ⑤ GND
- ⑥ GND
- ⑦ V_{IN}
- ⑧ V_{IN}

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

Typical Connection Diagram/Block Diagram



C_{IN} , C_B : Input and bias capacitors (Approx. 0.1 to 10 μ F)

Required when the input line contains inductance or when the wiring is long.

C_O : Output capacitor (47 μ F 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 500m Ω or less (at room temperature).

$R1$, $R2$: Output voltage setting resistors

The output voltage can be set by connecting $R1$ and $R2$ as shown at left.

The recommended value for $R2$ is 10k Ω .

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

C_{SS} : Soft start capacitor

The rising time of the output voltage can be set by connecting C_{SS} between V_{OUT} and ADJ.

Reference Data

Copper Laminate Area - Power Dissipation

