

SI-3000LLSL Series Surface-Mount, Low Current Consumption, Low Dropout Voltage Linear Regulator ICs

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

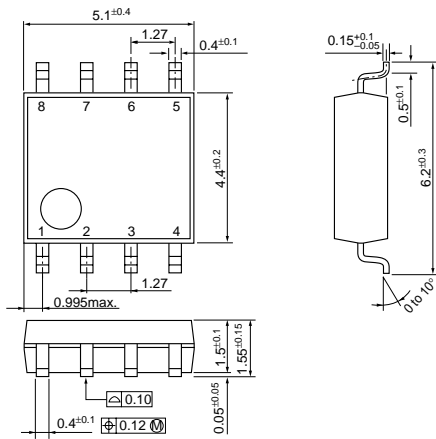
(T_a=25°C, V_C=2V, V_{IN}=1.8V, V_B=3.3V, V_O=1.5V unless otherwise specified)

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 , IH			V
	Control Voltage (Output OFF)	V _C , IL		0.8	V
	Control Current (Output ON)	I _C , IH		50	μA
	Control Current (Output ON)	Conditions	V _C =2.7V		
	Control Current (Output OFF)	I _C , IL		10	μA
Control Current (Output OFF)	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)

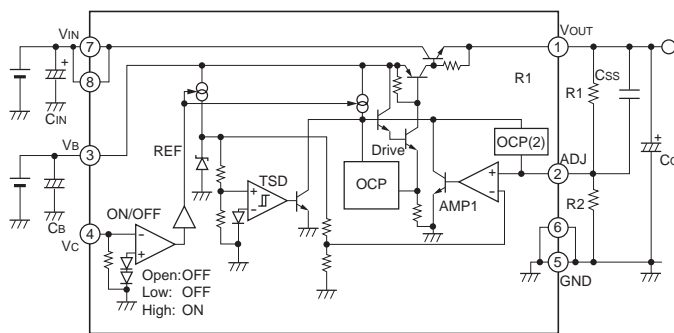


Pin Assignment

- ① 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_{IN}, C_b: Input and bias capacitors (Approx. 0.1 to 10μF)

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

C_o: 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).

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 10kΩ.

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

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

