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: 1μA 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))	$\theta_{(j\text{-}L)}$	36	°C/W
Thermal Resistance (Junction to Ambient Air)	$\theta_{(j\text{-}a)}$*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 $P_D = (V_{IN} - V_O) \times I_O$.

■Electrical Characteristics

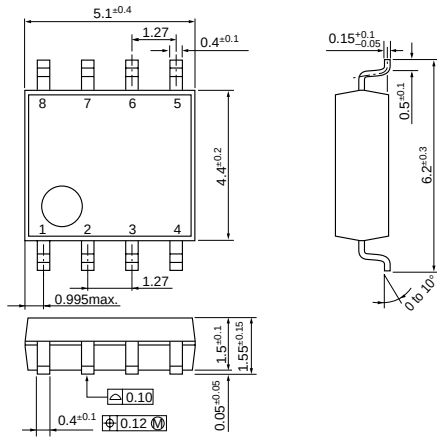
(T_a=25°C, V_C=2V, V_{IN}=1.8V, V_B=3.3V, V_O=1.5V, unless otherwise specified)

Parameter		Symbol	Ratings SI-3010LLSL min.	typ.	max.	Unit
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		$\Delta V_O/\Delta T_a$		±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	2			V
	Control Voltage (Output OFF)	V_C, IL			0.8	V
	Control Current (Output ON)	I_C, IH			50	μA
		Conditions	V_C=2.7V			
	Control Current (Output OFF)	I_C, IL			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)

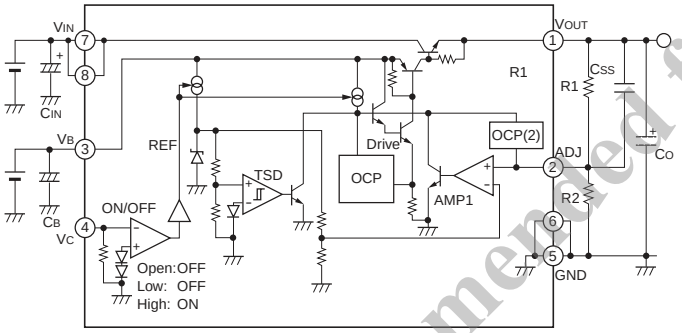
(unit : mm)



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 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.

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

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