

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

## Features

- Compact surface-mount package (SOT89-5)
- Output current: 250 mA
- Low current consumption  $I_q$  (OFF)  $\leq 1\mu\text{A}$  ( $V_c = 0\text{V}$ )
- Low dropout voltage:  $V_{DIF} \leq 0.5\text{V}$  (at  $I_o = 250\text{mA}$ )
- Output voltage range (1.5V to 15V)
- Built-in drooping-type-overcurrent and thermal protection circuits

## Absolute Maximum Ratings

(T<sub>a</sub>=25°C)

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V <sub>IN</sub>	18	V
Output control terminal voltage	V <sub>c</sub>	V <sub>IN</sub>	V
DC Output Current	I <sub>o</sub>	250	mA
Power Dissipation	P <sub>D</sub> <sup>*1</sup>	0.75	W
Junction Temperature	T <sub>j</sub> <sup>*2</sup>	-40 to +135	°C
Storage Temperature	T <sub>stg</sub> <sup>*2</sup>	-40 to +125	°C
Thermal Resistance (Junction to Ambient Air)	θ <sub>JA</sub> <sup>*1</sup>	146	°C/W

\*1: When mounted on glass-epoxy board 40 × 40 mm (copper laminate area 2%).

\*2: Thermal protection circuits may operate if the junction temperature exceeds 135°C.

## Applications

- Auxiliary power supplies for PC
- Battery-driven electronic equipment

## Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		min.	max.	
Input Voltage	V <sub>IN</sub>	*2, *3	V <sub>o</sub> +2 <sup>*1</sup>	V
DC Output Current	I <sub>o</sub>	0	250	mA
Operating Ambient Temperature	T <sub>op</sub>	-20	85	°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>.

Calculate these values referring to the reference data on page 69.

\*2: Refer to the Dropout Voltage parameter.

\*3: For the SI-3012LU, set the input voltage to V<sub>IN</sub> ≥ 2.4 V, and secure the minimum voltage as explained in "Setting DC Input Voltage" section in Linear Regulator Application Note.

## Electrical Characteristics

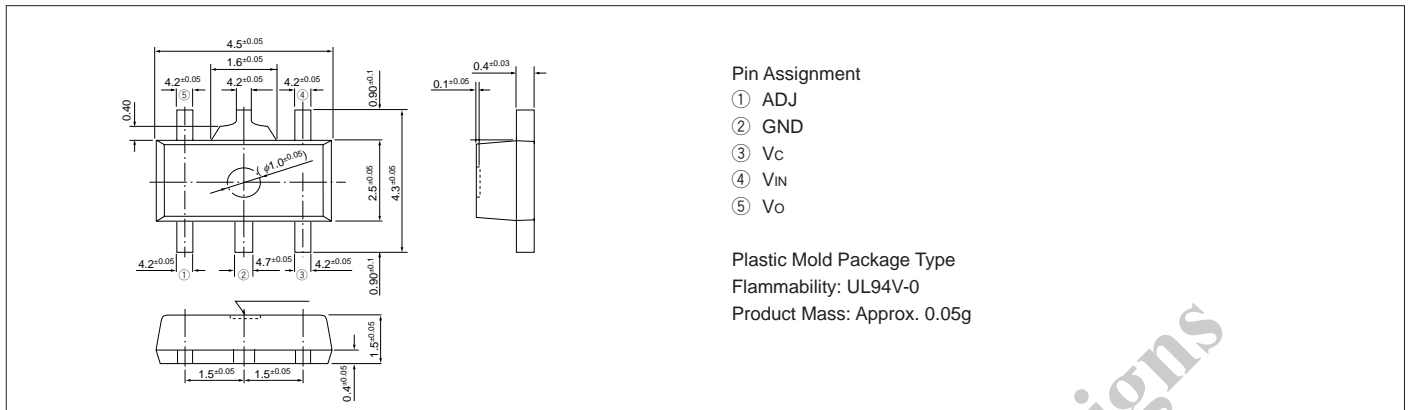
(T<sub>a</sub>=25°C, V<sub>c</sub>=2V, unless otherwise specified)

Parameter	Symbol	Ratings			Unit	
		SI-3012LU(Variable)				
		min.	typ.	max.		
Reference Voltage	V <sub>ADJ</sub> Conditions	1.210	1.250	1.290	V	
Dropout Voltage	V <sub>DIF</sub> Conditions		V <sub>IN</sub> =V <sub>o</sub> +1V, I <sub>o</sub> =10mA	0.3	V	
	Conditions		I <sub>o</sub> =100mA(V <sub>o</sub> =3.3V)	0.5		
	Conditions		I <sub>o</sub> =250mA(V <sub>o</sub> =3.3V)	0.5		
Line Regulation	ΔV <sub>LINE</sub> Conditions		V <sub>IN</sub> =V <sub>o</sub> +1 to V <sub>o</sub> +5V, I <sub>o</sub> =10mA( V <sub>o</sub> =3.3V)	10	mV	
Load Regulation	ΔV <sub>LOAD</sub> Conditions		V <sub>IN</sub> =V <sub>o</sub> +1V, I <sub>o</sub> =1 to 250mA( V <sub>o</sub> =3.3V)	20	mV	
Temperature Coefficient of Reference Voltage	ΔV <sub>o</sub> /ΔT <sub>a</sub> Conditions		±0.3		mV/°C	
Ripple Rejection	R <sub>REJ</sub> Conditions		55		dB	
			V <sub>IN</sub> =V <sub>o</sub> +1V, f=100 to 120Hz( V <sub>o</sub> =3.3V)			
Quiescent Circuit Current	I <sub>q</sub> Conditions			150	μA	
			V <sub>IN</sub> =V <sub>o</sub> +1V, I <sub>o</sub> =0mA V <sub>c</sub> =2V, R <sub>2</sub> =100kΩ			
Circuit Current at Output OFF	I <sub>q</sub> (OFF) Conditions			1	μA	
			V <sub>IN</sub> =V <sub>o</sub> +1V, V <sub>c</sub> =0V			
Overcurrent Protection Starting Current <sup>*1</sup>	I <sub>S1</sub> Conditions	260			mA	
			V <sub>IN</sub> =V <sub>o</sub> +1V			
V <sub>c</sub> Terminal	Control Voltage (Output ON) <sup>*2</sup>	V <sub>c</sub> , I <sub>H</sub>	2.0		V	
	Control Voltage (Output OFF) <sup>*2</sup>	V <sub>c</sub> , I <sub>L</sub>		0.8		
	Control Current (Output ON)	I <sub>c</sub> , I <sub>H</sub> Conditions		V <sub>c</sub> =2V	40	μA
	Control Current (Output OFF)	I <sub>c</sub> , I <sub>L</sub> Conditions		0	-5	μA
			V <sub>c</sub> =0V			

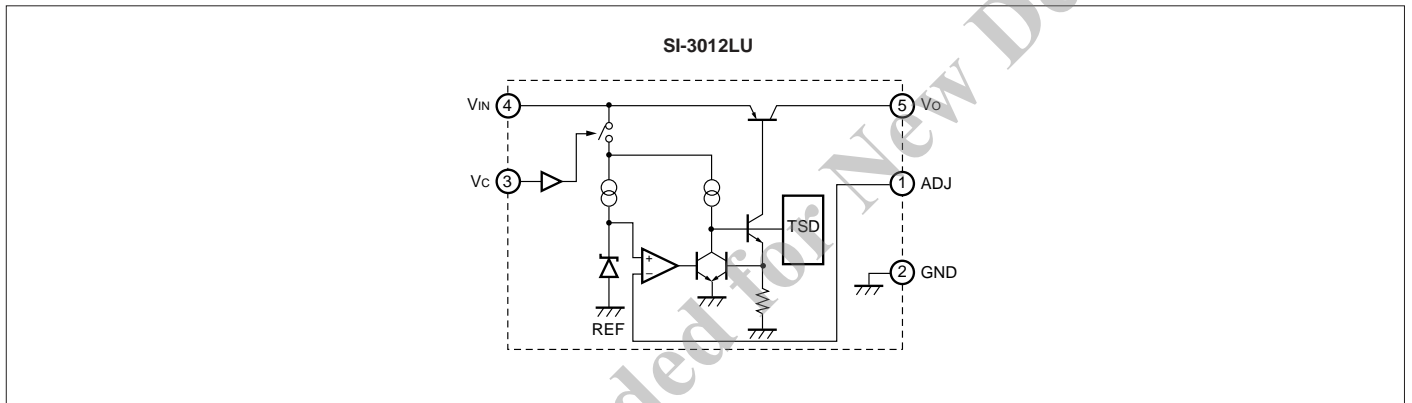
\*1: I<sub>S1</sub> is specified at the 5% drop point of output voltage V<sub>o</sub> on the condition that V<sub>IN</sub> = 3.3 V, and I<sub>o</sub> = 10 mA.\*2: Output is OFF when the output control terminal (V<sub>c</sub> terminal) is open. Each input level is equivalent to LS-TTL level. Therefore, the device can be driven directly by LS-TTLs.

External Dimensions (SOT89-5)

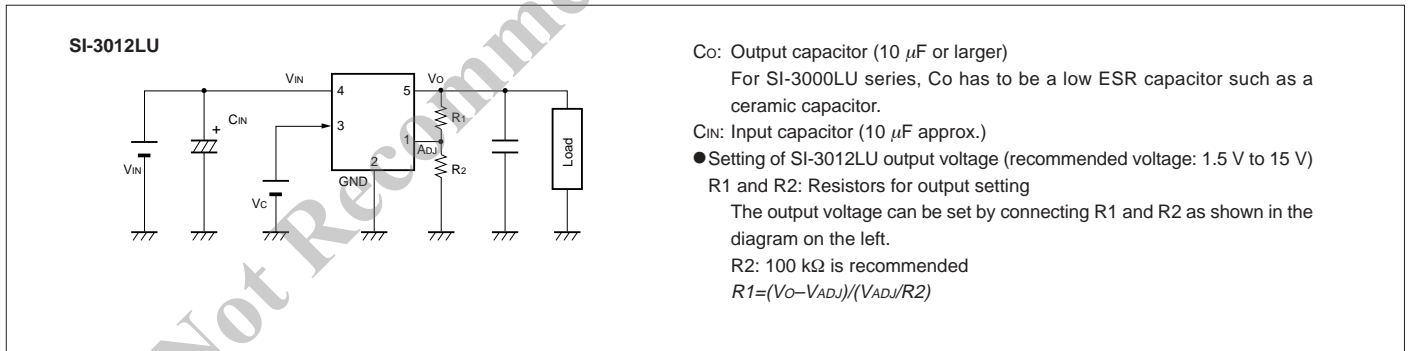
(Unit : mm)



Block Diagram



Typical Connection Diagram



Reference Data

