

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

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_a=25°C)

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V _{IN}	18	V
Output control terminal voltage	V _c	V _{IN}	V
DC Output Current	I _o	250	mA
Power Dissipation	P _D ^{*1}	0.75	W
Junction Temperature	T _j ^{*2}	-40 to +135	°C
Storage Temperature	T _{stg} ^{*2}	-40 to +125	°C
Thermal Resistance (Junction to Ambient Air)	θ _{JA} ^{*1}	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 _{IN}	*2, *3	V _O +2 ^{*1}	V
DC Output Current	I _o	0	250	mA
Operating Ambient Temperature	T _{op}	-20	85	°C

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

Calculate these values referring to the reference data on page 11.

*2: Refer to the Dropout Voltage parameter.

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

Electrical Characteristics

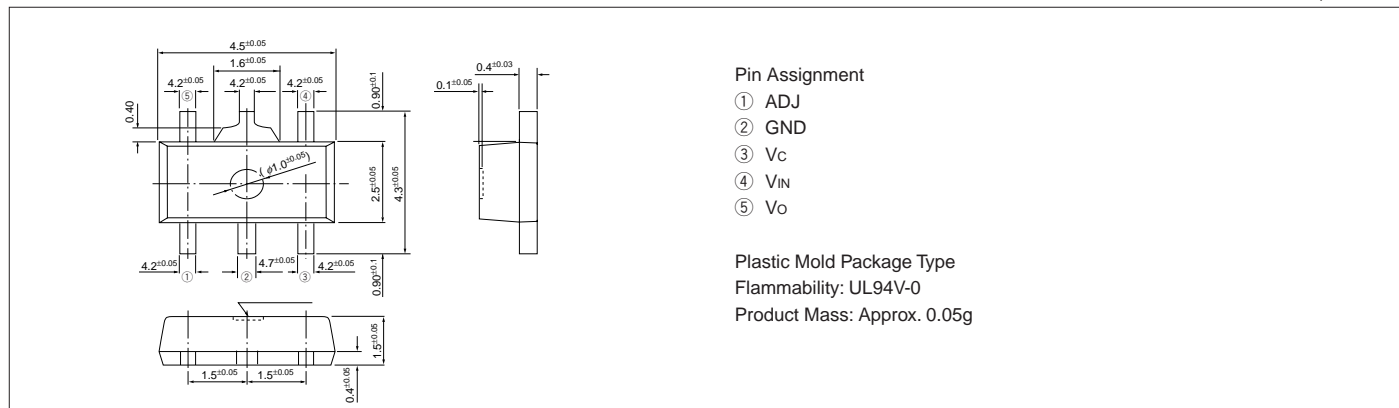
(T_a=25°C, V_c=2V unless otherwise specified)

Parameter	Symbol	Ratings			Unit
		SI-3012LU(Variable)			
		min.	typ.	max.	
Reference Voltage	V _{ADJ}	1.210	1.250	1.290	V
	Conditions	V _{IN} =V _O +1V, I _o =10mA			
Dropout Voltage	V _{DIF}			0.3	V
	Conditions	I _o =100mA(V _O =3.3V)			
	Conditions	I _o =250mA(V _O =3.3V)			
Line Regulation	ΔV _{LINE}			10	mV
	Conditions	V _{IN} =V _O +1 to V _O +5V, I _o =10mA(V _O =3.3V)			
Load Regulation	ΔV _{LOAD}			20	mV
	Conditions	V _{IN} =V _O +1V, I _o =1 to 250mA(V _O =3.3V)			
Temperature Coefficient of Reference Voltage	ΔV _O /ΔT _a		±0.3		mV/°C
	Conditions	T _j =0 to 100°C			
Ripple Rejection	R _{REJ}		55		dB
	Conditions	V _{IN} =V _O +1V, f=100 to 120Hz(V _O =3.3V)			
Quiescent Circuit Current	I _q			150	μA
	Conditions	V _{IN} =V _O +1V, I _o =0mA, V _c =2V, R ₂ =100kΩ			
Circuit Current at Output OFF	I _q (OFF)			1	μA
	Conditions	V _{IN} =V _O +1V, V _c =0V			
Overcurrent Protection Starting Current ^{*1}	I _{S1}	260			mA
	Conditions	V _{IN} =V _O +1V			
V _c Terminal	Control Voltage (Output ON) ^{*2}	V _{c, IH}	2.0		V
	Control Voltage (Output OFF) ^{*2}	V _{c, IL}		0.8	V
	Control Current (Output ON)	I _{c, IH}		40	μA
	Conditions	V _c =2V			
	Control Current (Output OFF)	I _{c, IL}		0	-5
Conditions	V _c =0V				

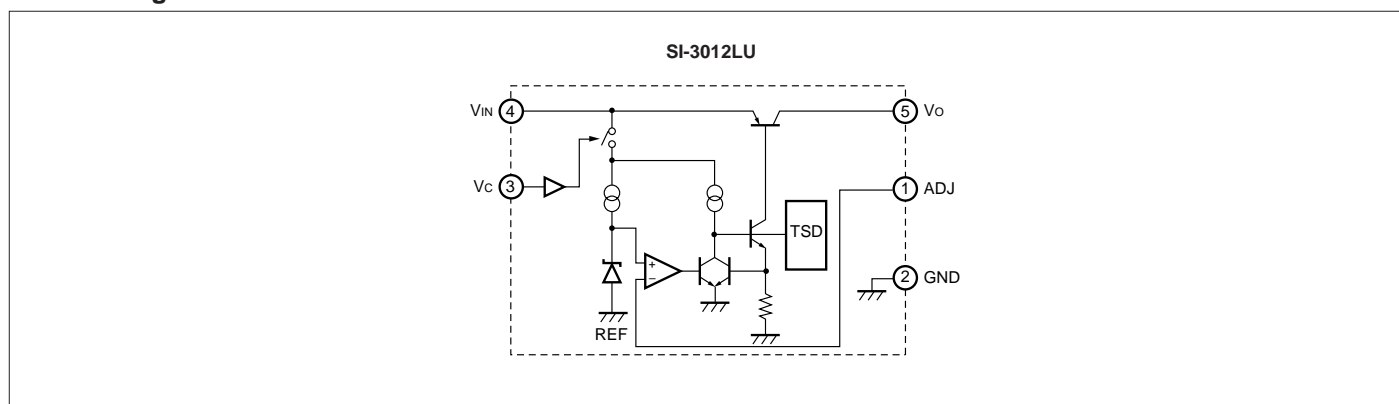
*1: I_{S1} is specified at the 5% drop point of output voltage V_O on the condition that V_{IN} = 3.3 V, and I_o = 10 mA.*2: Output is OFF when the output control terminal (V_c terminal) is open. Each input level is equivalent to LS-TTL level. Therefore, the device can be driven directly by LS-TTLs.

External Dimensions (SOT89-5)

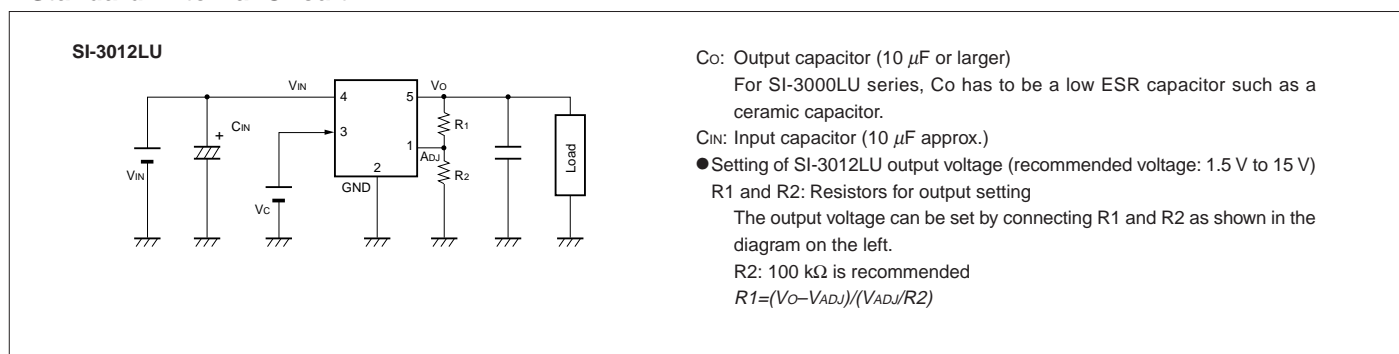
(Unit : mm)



Block Diagram



Standard External Circuit



Reference Data

