

SI-3000LUS Series

Surface-Mount, Low Current Consumption, Low Dropout Voltage Dropper Type

■Features

- Compact surface-mount package (SOT-89-3)
- Output current: 250 mA
- Low dropout voltage: $V_{DIF} \leq 0.5 \text{ V}$ (at $I_o = 250 \text{ mA}$)
- 4 types of output voltages (1.8 V, 2.5 V, 3.3 V, 5.0 V) available
- Built-in dropping type overcurrent, thermal protection circuits

■Applications

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



■Absolute Maximum Ratings

($T_a=25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V_{IN}	18	V
DC Output Current	I_o	250	mA
Power Dissipation	P_D^{*1}	0.75	W
Junction Temperature	T_j^{*2}	-40 to +135	$^\circ\text{C}$
Storage Temperature	T_{op}^{*2}	-40 to +125	$^\circ\text{C}$
Thermal Resistance (Junction to Ambient Air)	θ_{j-a}^{*1}	146	$^\circ\text{C/W}$

*1: When mounted on glass-epoxy board $40 \times 40 \text{ mm}$ (copper laminate area 2%)

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

■Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		min.	max.	
Input Voltage	V_{IN}	V_o+2^{*1}	V_o+2^{*1}	V
DC Output Current	I_o	0	250	mA
Ambient Operating Temperature	T_{op}	-20	85	$^\circ\text{C}$

*1: $V_{IN}(\text{max})$ and $I_o(\text{max})$ are restricted by the relationship $P_D = (V_{IN} - V_o) \times I_o$.

Calculate these values referring to the reference data.

*2: Refer to the dropout voltage section.

■Electrical Characteristics

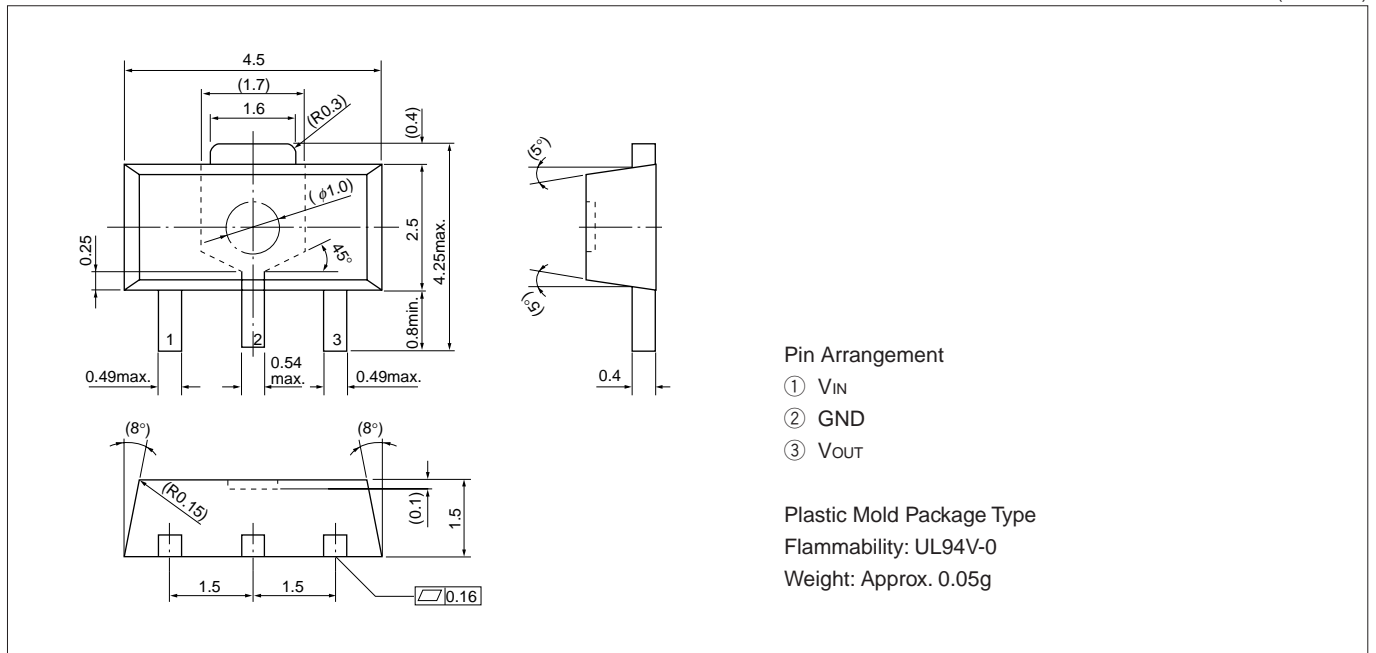
($T_a=25^{\circ}\text{C}$, $V_c=2\text{V}$ unless otherwise specified)

Parameter	Symbol	Ratings												Unit
		SI-3018LUS (Under development)			SI-3025LUS (Under development)			SI-3033LUS			SI-3050LUS (Under development)			
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Output Voltage	V_o	1.764	1.800	1.836	2.450	2.500	2.550	3.234	3.300	3.366	4.900	5.000	5.100	V
	Conditions	$V_{IN}=3.3\text{V}$, $I_o=10\text{mA}$			$V_{IN}=3.3\text{V}$, $I_o=10\text{mA}$			$V_{IN}=5\text{V}$, $I_o=10\text{mA}$			$V_{IN}=6\text{V}$, $I_o=10\text{mA}$			
Dropout Voltage	V_{DIF}			0.3			0.3			0.3			0.3	V
	Conditions	$I_o=100\text{mA}$												
	Conditions			0.5			0.5			0.5			0.5	
Line Regulation	ΔV_{LINE}			10			10			10			10	mV
	Conditions	$V_{IN}=3.3$ to 5V , $I_o=10\text{mA}$			$V_{IN}=3.3$ to 5V , $I_o=10\text{mA}$			$V_{IN}=4.5$ to 8V , $I_o=10\text{mA}$			$V_{IN}=6$ to 10V , $I_o=10\text{mA}$			
Load Regulation	ΔV_{LOAD}			40			40			40			40	mV
	Conditions	$V_{IN}=3.3\text{V}$, $I_o=0$ to 250mA			$V_{IN}=3.3\text{V}$, $I_o=0$ to 250mA			$V_{IN}=5\text{V}$, $I_o=0$ to 250mA			$V_{IN}=6\text{V}$, $I_o=0$ to 250mA			
Temperature Coefficient of Output Voltage	$\Delta V_o/\Delta T_a$		± 0.25			± 0.25			± 0.3			± 0.3		mV/ $^{\circ}\text{C}$
	Conditions	$T_j=0$ to 100°C												
Ripple Rejection	R_{REJ}		55			55			55			55		dB
	Conditions	$V_{IN}=3.3\text{V}$, $f=100$ to 120Hz			$V_{IN}=3.3\text{V}$, $f=100$ to 120Hz			$V_{IN}=5\text{V}$, $f=100$ to 120Hz			$V_{IN}=6\text{V}$, $f=100$ to 120Hz			
Quiescent Circuit Current	I_q			250			250			250			250	μA
	Conditions	$V_{IN}=3.3\text{V}$, $I_o=0\text{mA}$			$V_{IN}=3.3\text{V}$, $I_o=0\text{mA}$			$V_{IN}=5\text{V}$, $I_o=0\text{mA}$			$V_{IN}=6\text{V}$, $I_o=0\text{mA}$			
Overcurrent Protection Starting Current ^{*1}	I_{s1}	260			260			260			260			mA
	Conditions	$V_{IN}=3.3\text{V}$			$V_{IN}=3.3\text{V}$			$V_{IN}=5\text{V}$			$V_{IN}=6\text{V}$			

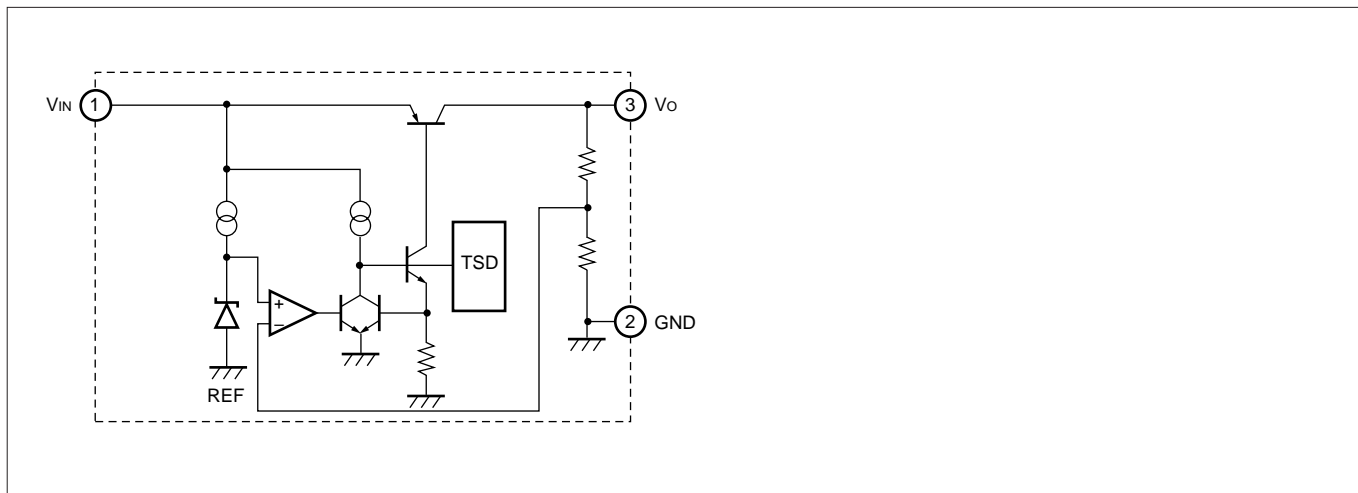
*1: I_{s1} is specified as the 5% drop point of output voltage V_o on the condition that $V_{IN}=3.3\text{V}$ (5 V for SI-3033LUS, 6 V for SI-3050LUS), and $I_o=10\text{mA}$.

■External Dimensions

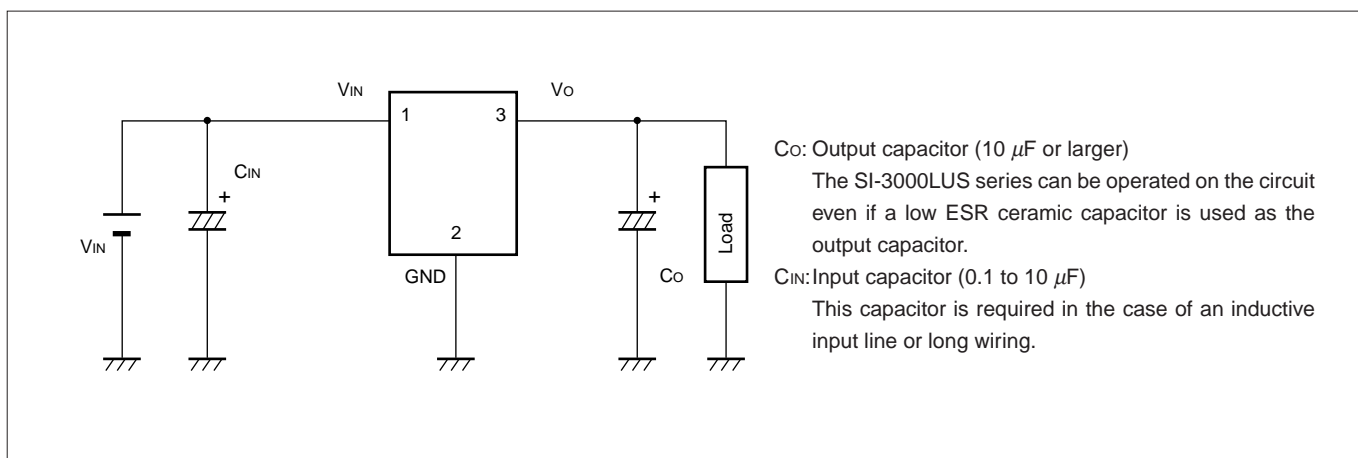
(Unit : mm)



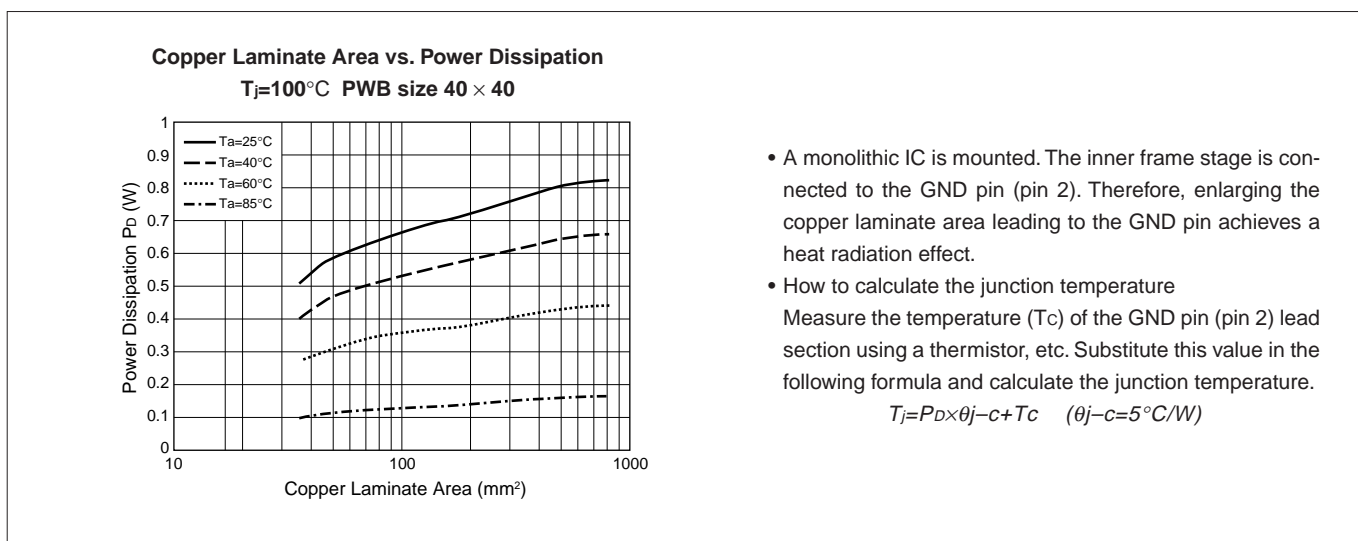
■Block Diagram



■Standard External Circuit



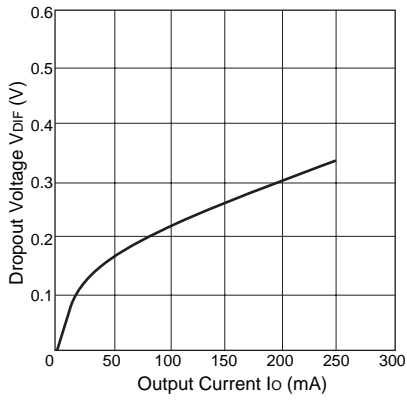
■Reference Data



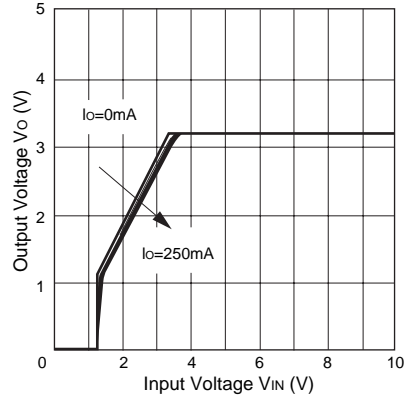
■Typical Characteristics of SI-3033LUS

($T_a=25^\circ\text{C}$)

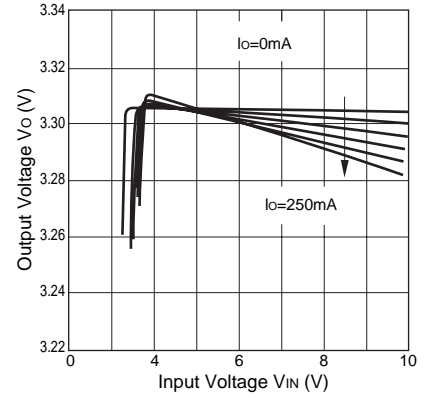
I_o vs. V_{DIF} Characteristics



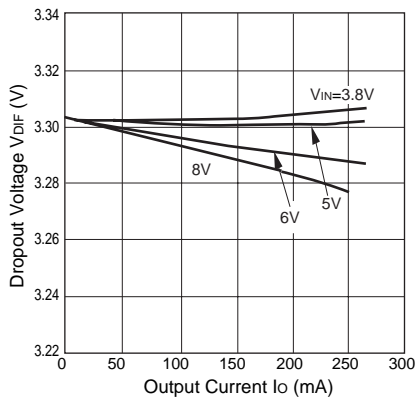
Output Voltage Characteristics



Line Regulation



Load Regulation



Overcurrent Protection Characteristics

