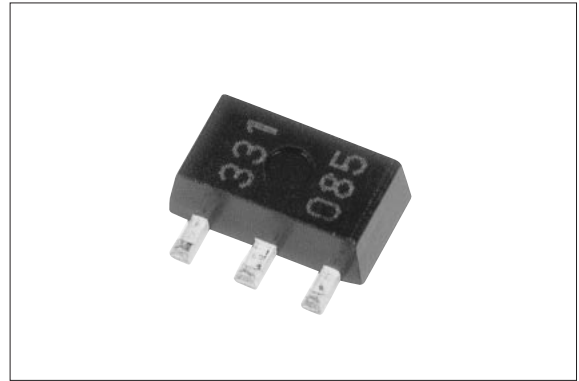# SI-3000LUS Series

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: $V_{DIF} \leq 0.5$ V (at I_O = 250 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

(Ta=25°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	°C
Storage Temperature	T_{op}[*2]	−40 to +125	°C
Thermal Resistance (Junction to Ambient Air)	$\theta_{j\text{-}a}$[*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

■Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		min.	max.	
Input Voltage	V_{IN}	*2	V_O+2[*1]	V
DC Output Current	I_O	0	250	mA
Ambient Operating Temperature	T_{op}	−20	85	°C

*1: V_{IN} (max) and I_O (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.
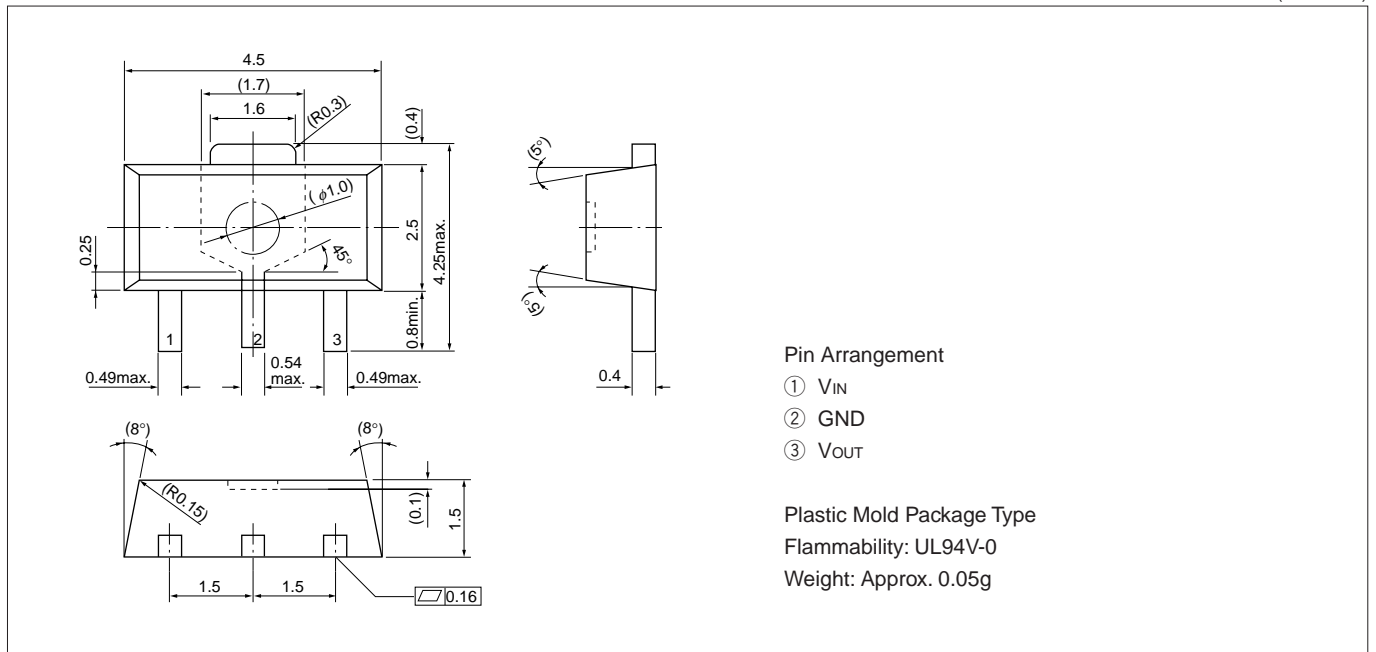
■Electrical Characteristics

(Ta=25°C, Vc=2V unless otherwise specified)

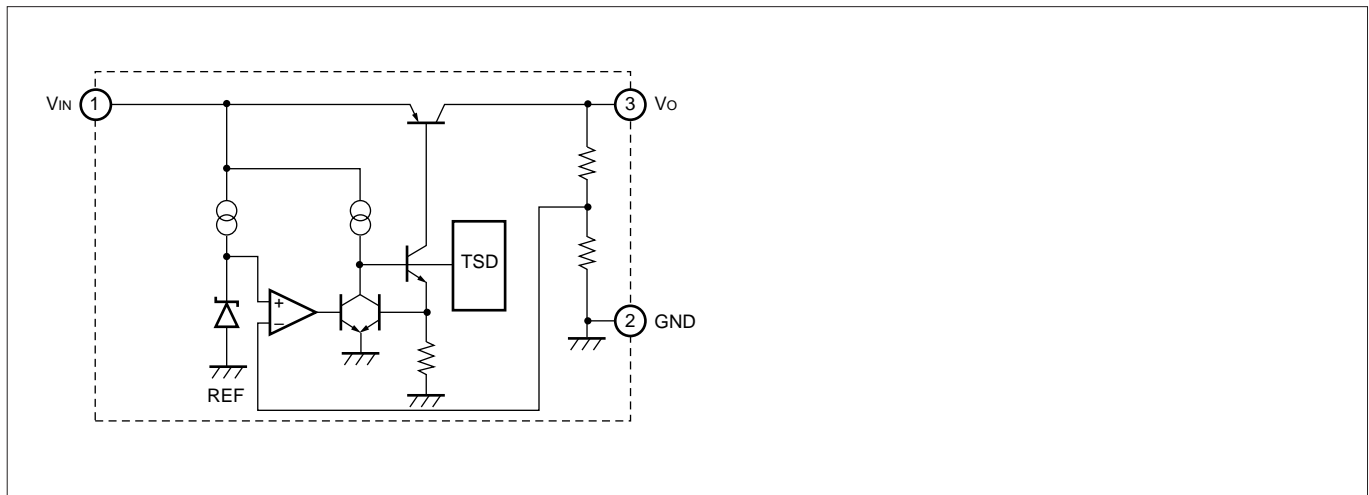| Parameter	Symbol	SI-3018LUS (Under development)			SI-3025LUS (Under development)			SI-3033LUS			SI-3050LUS (Under development)			Unit
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
Output Voltage	V_O	1.764	1.800	1.836	2.450	2.500	2.550	3.234	3.300	3.366	4.900	5.000	5.100	V
	Conditions	V_{IN}=3.3V, I_O=10mA			V_{IN}=3.3V, I_O=10mA			V_{IN}=5V, I_O=10mA			V_{IN}=6V, I_O=10mA			
Dropout Voltage	V_{DIF}			0.3			0.3			0.3			0.3	V
	Conditions	I_O=100mA												
				0.5			0.5			0.5			0.5	
	Conditions	I_O=250mA												
Line Regulation	ΔV_{LINE}			10			10			10			10	mV
	Conditions	V_{IN}=3.3 to 5V, I_O=10mA			V_{IN}=3.3 to 5V, I_O=10mA			V_{IN}=4.5 to 8V, I_O=10mA			V_{IN}=6 to 10V, I_O=10mA			
Load Regulation	ΔV_{LOAD}			40			40			40			40	mV
	Conditions	V_{IN}=3.3V, I_O=0 to 250mA			V_{IN}=3.3V, I_O=0 to 250mA			V_{IN}=5V, I_O=0 to 250mA			V_{IN}=6V, 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/°C
	Conditions	T_j=0 to 100°C												
Ripple Rejection	R_{REJ}	55			55			55			55			dB
	Conditions	V_{IN}=3.3V, f=100 to 120Hz			V_{IN}=3.3V, f=100 to 120Hz			V_{IN}=5V, f=100 to 120Hz			V_{IN}=6V, f=100 to 120Hz			
Quiescent Circuit Current	I_q			250			250			250			250	μA
	Conditions	V_{IN}=3.3V, I_O=0mA			V_{IN}=3.3V, I_O=0mA			V_{IN}=5V, I_O=0mA			V_{IN}=6V, I_O=0mA			
Overcurrent Protection Starting Current[*1]	I_{S1}	260			260			260			260			mA
	Conditions	V_{IN}=3.3V			V_{IN}=3.3V			V_{IN}=5V			V_{IN}=6V			

*1: I_{S1} is specified as the 5% drop point of output voltage V_O on the condition that V_{IN}=3.3 V (5 V for SI-3033LUS, 6 V for SI-3050LUS), and I_O=10 mA.
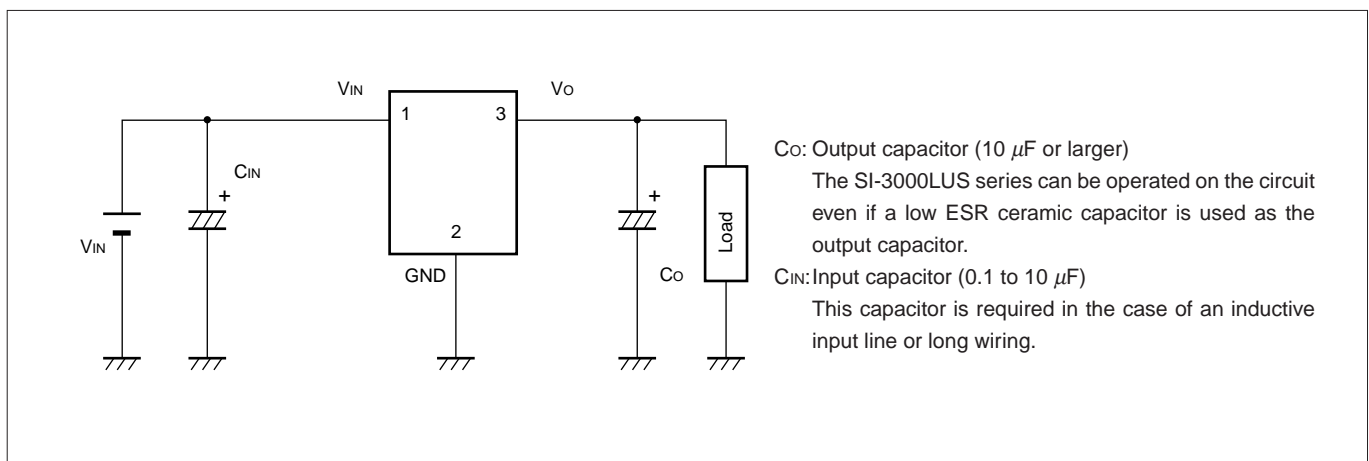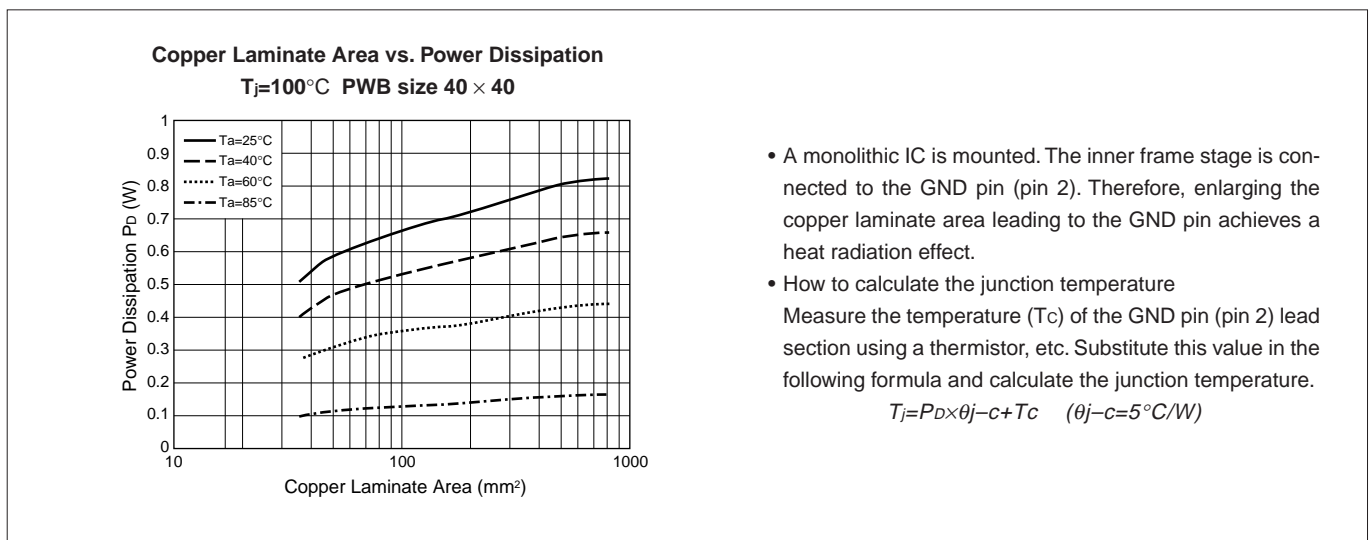
■External Dimensions

(Unit : mm)

Pin Arrangement
① V_{IN}
② GND
③ V_{OUT}

Plastic Mold Package Type
Flammability: UL94V-0
Weight: Approx. 0.05g

■**Block Diagram**

■**Standard External Circuit**

C$_O$: Output capacitor (10 μF or larger)

The SI-3000LUS series can be operated on the circuit even if a low ESR ceramic capacitor is used as the output capacitor.

C$_{IN}$: Input capacitor (0.1 to 10 μF)

This capacitor is required in the case of an inductive input line or long wiring.

■**Reference Data**

Copper Laminate Area vs. Power Dissipation
T$_j$=100°C PWB size 40 × 40

- A monolithic IC is mounted. The inner frame stage is connected to the GND pin (pin 2). Therefore, enlarging the copper laminate area leading to the GND pin achieves a heat radiation effect.
- How to calculate the junction temperature

Measure the temperature (T$_C$) of the GND pin (pin 2) lead section using a thermistor, etc. Substitute this value in the following formula and calculate the junction temperature.

$$T_j = P_D \times \theta j{-}c + Tc \quad (\theta j{-}c = 5°C/W)$$

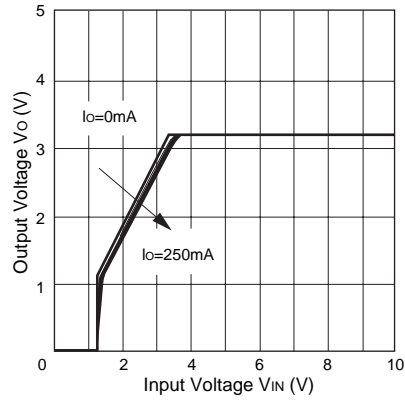## ■Typical Characteristics of SI-3033LUS
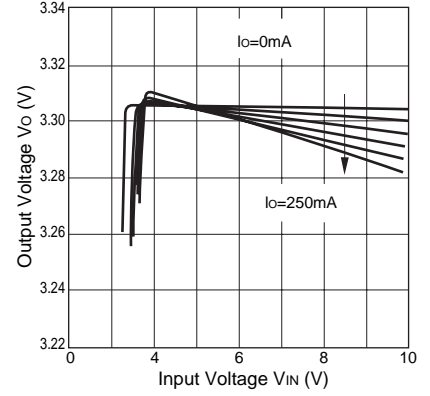
(T_a=25°C)

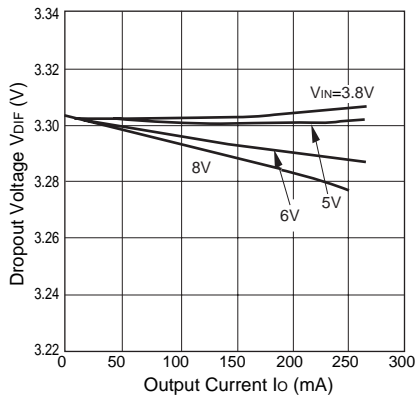**Io vs. V_DIF Characteristics**

Output Voltage Characteristics

Line Regulation

Load Regulation

Overcurrent Protection Characteristics