

SI-3000N Series

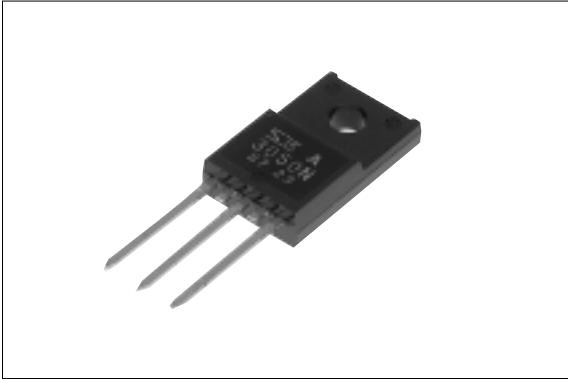
3-Terminal, Full-Mold, Low Dropout Voltage Dropper Type

■Features

- Compact full-mold package (equivalent to TO220)
- Output current: 1.0A
- Low dropout voltage: $V_{\text{DIF}} \leq 1\text{V}$ (at $I_o = 1.0\text{A}$)
- Built-in foldback overcurrent, overvoltage, thermal protection circuits

■Applications

- For stabilization of the secondary stage of switching power supplies
- Electronic equipment



■Absolute Maximum Ratings

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

Parameter	Symbol	Ratings			Unit
		SI-3050N	SI-3090N/3120N	SI-3150N	
DC Input Voltage	V_{IN}	25	30	35	V
DC Output Current	I_o	1.0 ²			A
Power Dissipation	P_{D1}	14(With infinite heatsink)			W
	P_{D2}	1.5(Without heatsink, stand-alone operation)			W
Junction Temperature	T_j	-40 to +125			$^\circ\text{C}$
Ambient Operating Temperature	T_{op}	-30 to +100			$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125			$^\circ\text{C}$
Thermal Resistance (junction to case)	$R_{\text{th(j-c)}}$	7.0			$^\circ\text{C/W}$
Thermal Resistance (junction to ambient air)	$R_{\text{th(j-a)}}$	66.7(Without heatsink, stand-alone operation)			$^\circ\text{C/W}$

■Electrical Characteristics

(T_a=25°C unless otherwise specified)

Parameter	Symbol	Ratings												Unit	
		SI-3050N			SI-3090N			SI-3120N			SI-3150N				
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.		
Input Voltage	V _{IN}	6 ³		15 ²	10 ³		20 ²	13 ³		25 ²	16 ³		27 ²	V	
Output Voltage	SI-3000N ^{*1}	V _O	4.80	5.00	5.20	8.64	9.00	9.36	11.52	12.00	12.48	14.40	15.00	15.60	V
	SI-3000NA		4.90	5.00	5.10	8.82	9.00	9.18	11.76	12.00	12.24	14.70	15.00	15.30	
		Conditions	V _{IN} =8V, I _O =0.5A			V _{IN} =12V, I _O =0.5A			V _{IN} =15V, I _O =0.5A			V _{IN} =18V, I _O =0.5A			
Dropout Voltage	V _{DIF}			0.5			0.5			0.5			0.5	V	
	Conditions	I _O ≤0.5A													
				1.0			1.0			1.0			1.0		
	Conditions	I _O ≤1.0A													
Line Regulation	ΔV _{OLINE}		10	30		18	48		24	64		30	90	mV	
	Conditions	V _{IN} =6 to 15V, I _O =0.5A			V _{IN} =10 to 20V, I _O =0.5A			V _{IN} =13 to 25V, I _O =0.5A			V _{IN} =16 to 27V, I _O =0.5A				
Load Regulation	ΔV _{OLOAD}		40	100		70	180		93	240		120	300	mV	
	Conditions	V _{IN} =8V, I _O =0 to 1.0A			V _{IN} =12V, I _O =0 to 1.0A			V _{IN} =15V, I _O =0 to 1.0A			V _{IN} =18V, I _O =0 to 1.0A				
Temperature Coefficient of Output Voltage	ΔV _O /ΔT _a		±0.5			±1.0			±1.5			±1.5		mV/°C	
	Conditions	V _{IN} =8V, I _O =5mA, T _J =0 to 100°C			V _{IN} =12V, I _O =5mA, T _J =0 to 100°C			V _{IN} =15V, I _O =5mA, T _J =0 to 100°C			V _{IN} =18V, I _O =5mA, T _J =0 to 100°C				
Ripple Rejection	R _{REJ}		54			54			54			54		dB	
	Conditions	V _{IN} =8V, f=100 to 120Hz			V _{IN} =12V, f=100 to 120Hz			V _{IN} =15V, f=100 to 120Hz			V _{IN} =18V, f=100 to 120Hz				
Quiescent Circuit Current	I _q		3	10		3	10		3	10		3	10	mA	
	Conditions	V _{IN} =8V, I _O =0A			V _{IN} =12V, I _O =0A			V _{IN} =15V, I _O =0A			V _{IN} =18V, I _O =0A				
Overcurrent Protection Starting Current ^{*4,5}	I _{S1}	1.2			1.2			1.2			1.2			A	
	Conditions	V _{IN} =8V			V _{IN} =12V			V _{IN} =15V			V _{IN} =18V				

*1: "A" may be indicated to the right of the Sanken logo.

*2: V_{IN(max)} and I_{O(max)} are restricted by the relation P_{D(max)}=(V_{IN}-V_O)•I_O≤14(W).

*3: Refer to the dropout voltage.(Refer to Setting DC Input Voltage on page 7.)

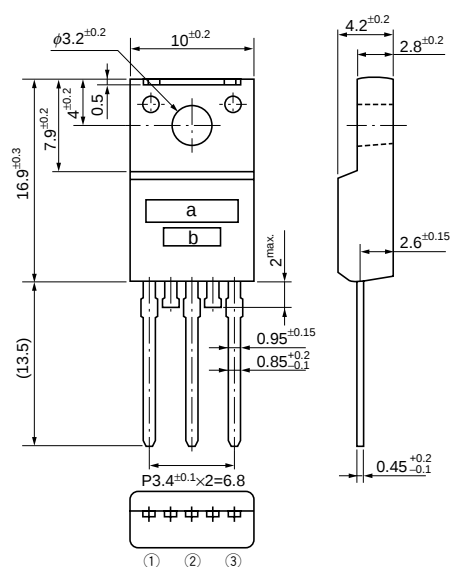
*4: I_{s1} is specified at -5(%) drop point of output voltage V_O on the condition that V_{IN}=V_O+3V, I_O=0.5A.

*5: A foldback type overcurrent protection circuit is built into the IC regulator. Therefore, avoid using it for the following applications as it may cause starting errors:

(1) Constant current load (2) Plus/minus power (3) Series power (4) V_O adjustment by raising ground voltage

■External Dimensions

(unit: mm)



a. Part Number
b. Lot Number

Pin Arrangement

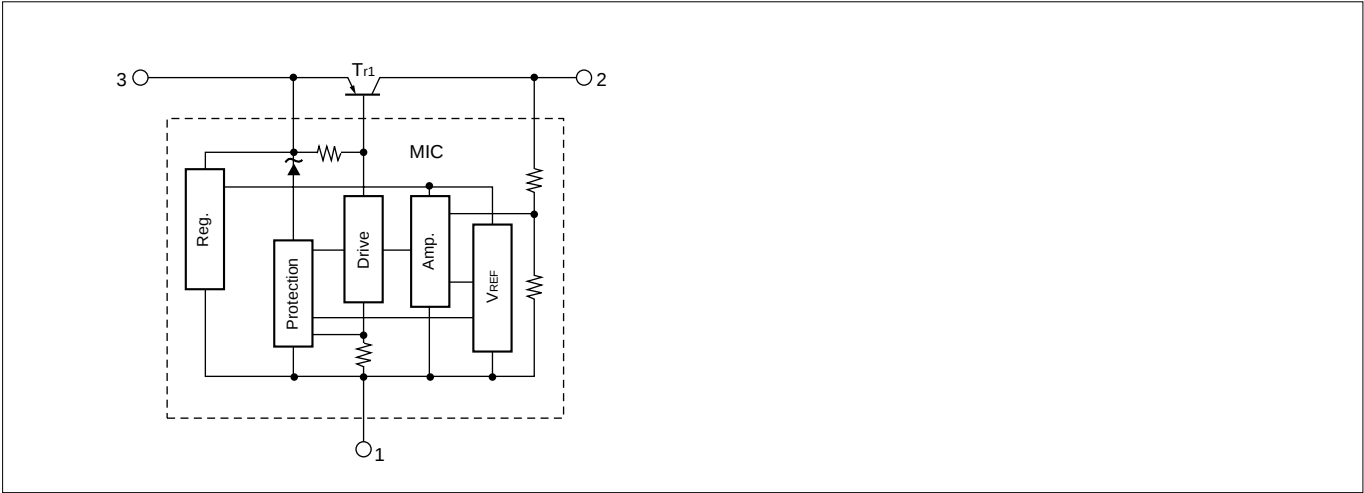
- ① GND
- ② V_O
- ③ V_{IN}

Plastic Mold Package Type

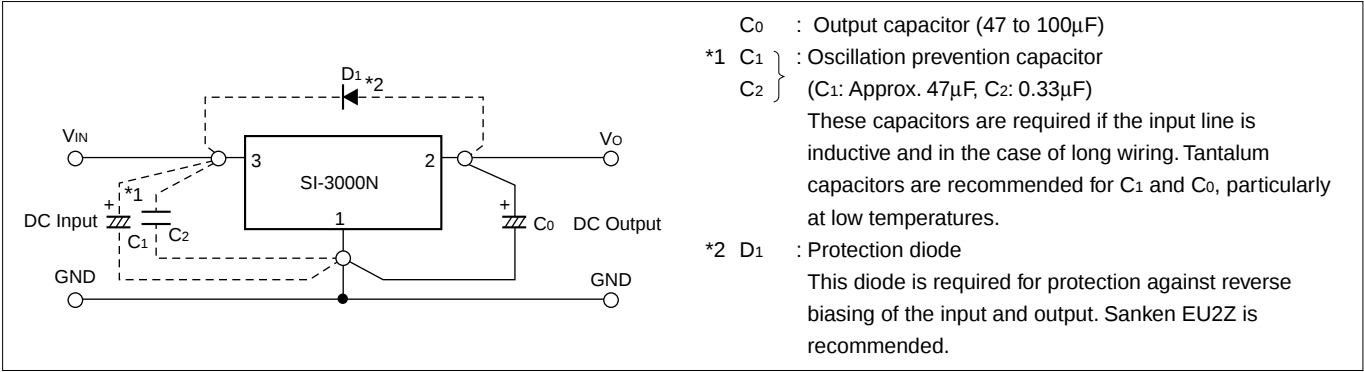
Flammability: UL94V-0

Weight: Approx. 2.3g

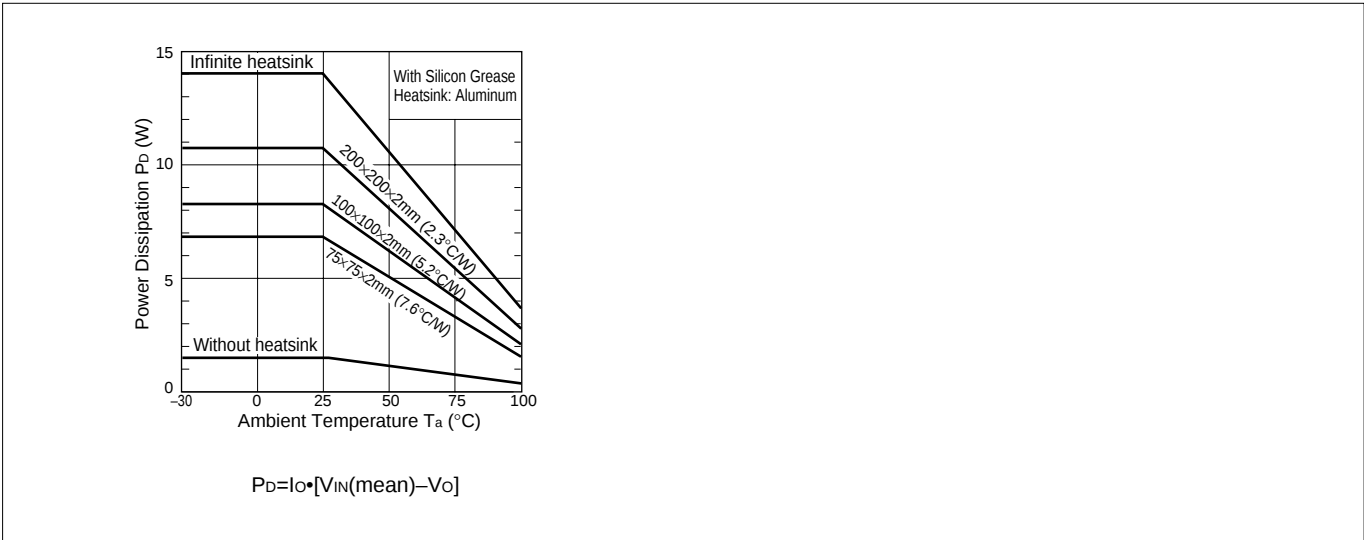
■Block Diagram



■Standard External Circuit



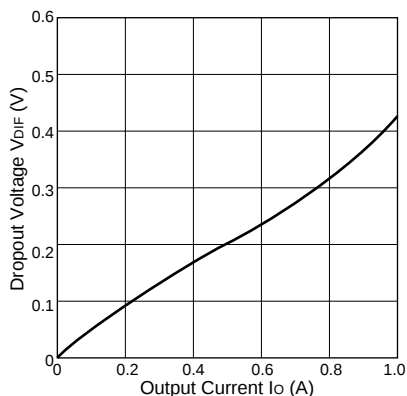
■ T_a - P_D Characteristics



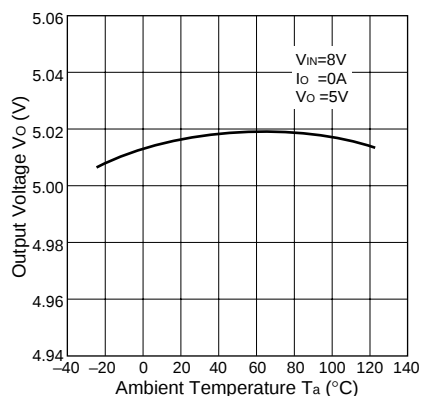
■Typical Characteristics

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

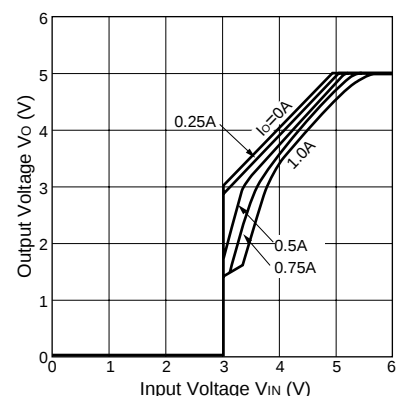
I_o vs. V_{DIF} Characteristics



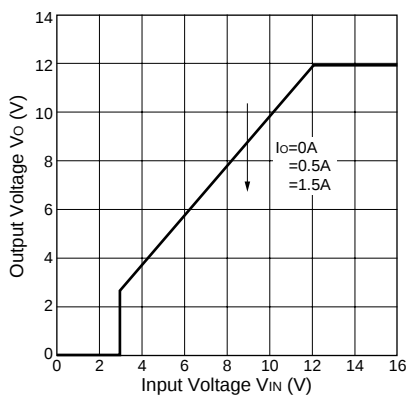
Temperature Coefficient of Output Voltage(SI-3050N)



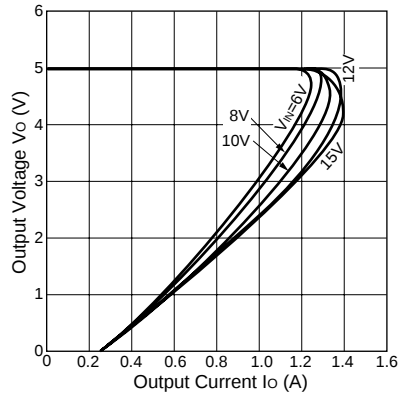
Output Voltage(SI-3050N)



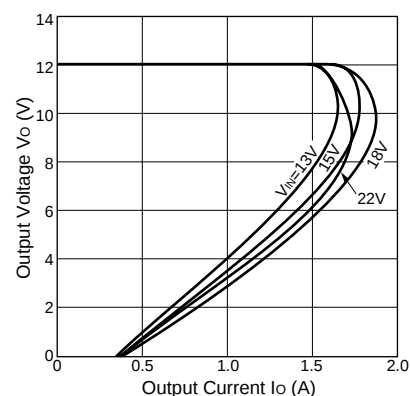
Output Voltage(SI-3120N)



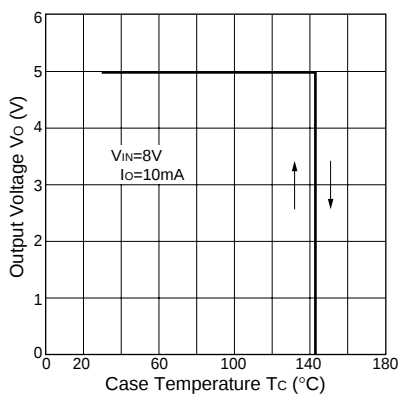
Overcurrent Protection Characteristics(SI-3050N)



Overcurrent Protection Characteristics(SI-3120N)



Thermal Protection Characteristics(SI-3050N)



Note on Thermal Protection:

The thermal protection circuit is intended for protection against heat during instantaneous short-circuiting. Its operation is not guaranteed for continuous heating condition such as short-circuiting over extended periods of time.