

# SI-8000S Series Full-Mold, Separate Excitation Step-down Switching Mode Regulator ICs

## Features

- Compact full-mold package (equivalent to TO220)
- Output current: 3.0A
- High efficiency: 79 to 91%
- Requires only 4 discrete components
- Internally-adjusted phase correction and output voltage
- Built-in reference oscillator (60kHz)
- Built-in overcurrent and thermal protection circuits
- Built-in soft start circuit (Output ON/OFF available)

## Lineup

Part Number	SI-8033S	SI-8050S	SI-8090S	SI-8120S	SI-8150S
V <sub>o</sub> (V)	3.3	5.0	9.0	12.0	15.0
I <sub>o</sub> (A)	3.0				

## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
DC Input Voltage	V <sub>IN</sub>	43*	V
Power Dissipation	P <sub>D1</sub>	18(With infinite heatsink)	W
	P <sub>D2</sub>	1.5(Without heatsink, stand-alone operation)	W
Junction Temperature	T <sub>j</sub>	+125	°C
Storage Temperature	T <sub>stg</sub>	-40 to +125	°C
SW Terminal Applied Reverse Voltage	V <sub>SW</sub>	-1	V
Thermal Resistance(junction to case)	θ <sub>J-C</sub>	5.5	°C/W

\*35V for SI-8033S

## Applications

- Power supplies for telecommunication equipment
- Onboard local power supplies

## Recommended Operating Conditions

Parameter	Symbol	Ratings					Unit
		SI-8033S	SI-8050S	SI-8090S	SI-8120S	SI-8150S	
DC Input Voltage Range	V <sub>IN</sub>	5.5 to 28	7 to 40	12 to 40	15 to 40	18 to 40	V
Output Current Range	I <sub>o</sub>	0 to 3.0					A
Operating Junction Temperature Range	T <sub>top</sub>	-30 to +125					°C

## Electrical Characteristics

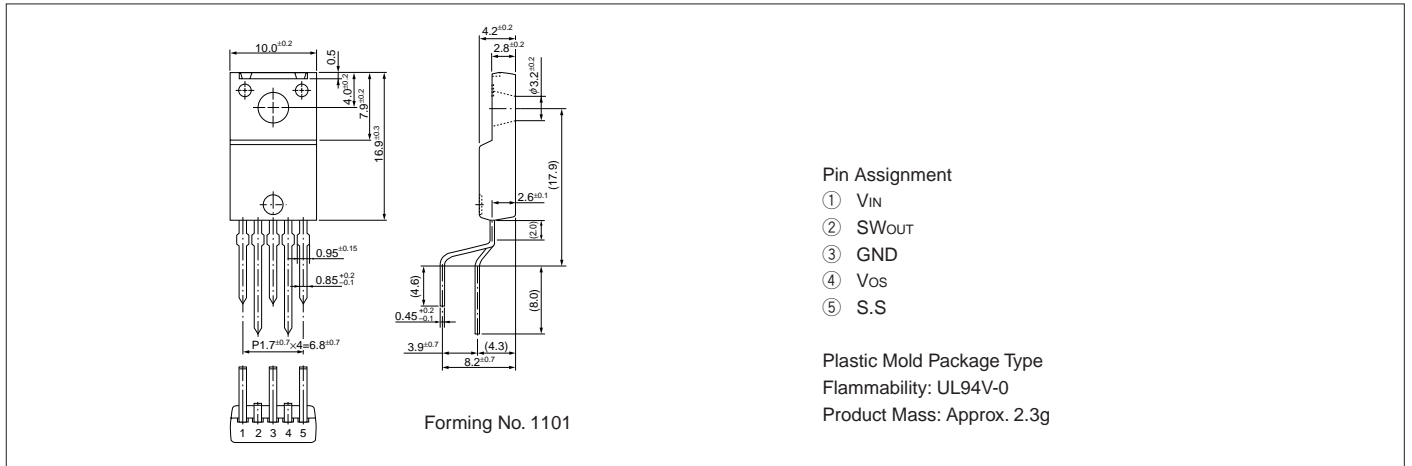
(T<sub>a</sub>=25°C)

Parameter	Symbol	Ratings															Unit	
		SI-8033S			SI-8050S			SI-8090S			SI-8120S			SI-8150S				
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.		
Output Voltage	SI-8000S*1	3.17	3.30	3.43	4.80	5.00	5.20	8.55	9.00	9.45	11.50	12.00	12.50	14.25	15.00	15.75	V	
	SI-8000SS	3.234	3.30	3.366	4.90	5.00	5.10											
Efficiency	η	79			84			88			90			91			%	
	Conditions	V <sub>IN</sub> =15V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =20V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =21V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =24V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =25V, I <sub>o</sub> =1.0A				
Oscillation Frequency	f	60			60			60			60			60			kHz	
	Conditions	V <sub>IN</sub> =15V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =20V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =21V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =24V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =25V, I <sub>o</sub> =1.0A				
Line Regulation	ΔV <sub>OLINE</sub>	25	80	40			50	120	60			130	60			130	mV	
	Conditions	V <sub>IN</sub> =8 to 28V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =10 to 30V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =15 to 30V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =18 to 30V, I <sub>o</sub> =1.0A			V <sub>IN</sub> =21 to 30V, I <sub>o</sub> =1.0A				
Load Regulation	ΔV <sub>LOAD</sub>	10	30	10			40	10			40	10			40	mV		
	Conditions	V <sub>IN</sub> =15V, I <sub>o</sub> =0.5 to 1.5A			V <sub>IN</sub> =20V, I <sub>o</sub> =0.5 to 1.5A			V <sub>IN</sub> =21V, I <sub>o</sub> =0.5 to 1.5A			V <sub>IN</sub> =24V, I <sub>o</sub> =0.5 to 1.5A			V <sub>IN</sub> =25V, I <sub>o</sub> =0.5 to 1.5A				
Temperature Coefficient of Output Voltage	ΔV <sub>o</sub> /ΔT <sub>a</sub>	±0.5			±0.5			±1.0			±1.0			±1.0			mV/°C	
Overcurrent Protection Starting Current	I <sub>s1</sub>	3.1	3.1			3.1			3.1			3.1			3.1			A
	Conditions	V <sub>IN</sub> =15V			V <sub>IN</sub> =20V			V <sub>IN</sub> =21V			V <sub>IN</sub> =24V			V <sub>IN</sub> =25V				

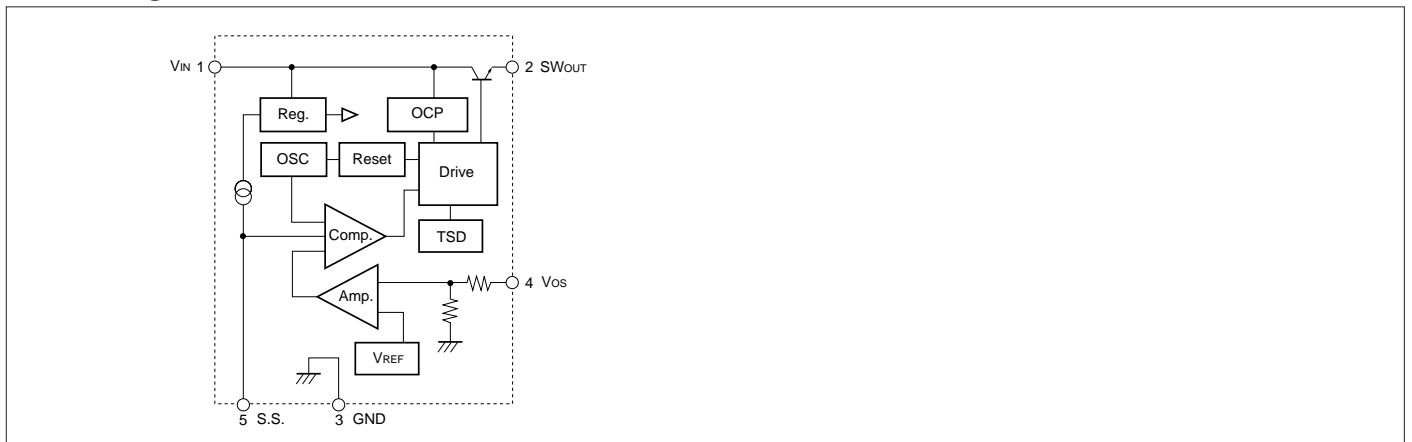
\*1: "S" may be printed to the right of the marking (except SI-8090S, SI-8120S, SI-8150S).

External Dimensions (TO220F-5)

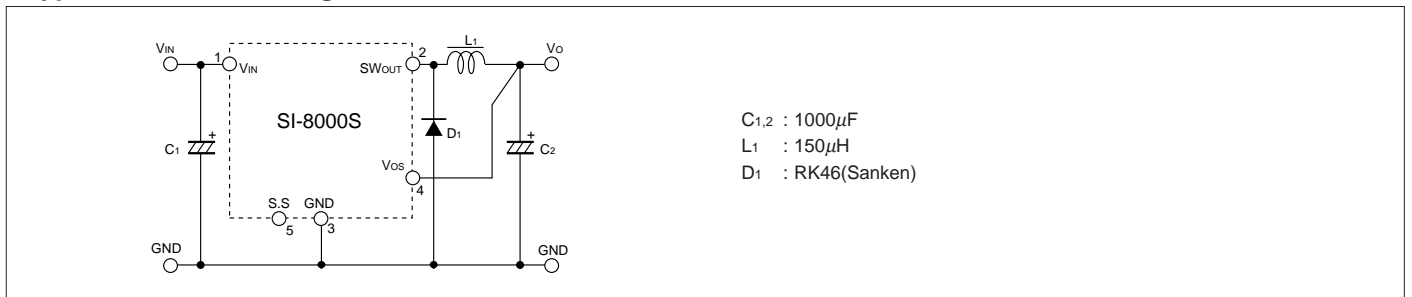
(Unit : mm)



Block Diagram



Typical Connection Diagram



Ta-Pd Characteristics

