

# SI-8000GL Series Compact, Separate Excitation Step-down Switching Mode Regulator ICs

## Features

- DIP 8 pin package
- Output current: 1.5A
- High efficiency: 86% (at  $V_{IN} = 20V$ ,  $I_O = 1A$ ,  $V_O = 5V$ )
- Capable of downsize a choke-coil due to IC's high switching frequency (250kHz). (Compared with conventional Sanken devices)
- The output-voltage-variable type can vary its output voltage from 1V to 14V because of its low reference voltage ( $V_{REF}$ ) of 1V.
- Wide Input Voltage Range (8 to 50V)
- Output ON/OFF available
- Built-in overcurrent protection and thermal protection circuits

## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
DC Input Voltage	$V_{IN}$	53	V
Power Dissipation	$P_D^{*1}$	1	W
Junction Temperature	$T_j$	+125	°C
Storage Temperature	$T_{stg}$	-40 to +125	°C
Thermal Resistance (junction to case)	$\theta_{j-c}$	28	°C/W
Thermal Resistance (junction to ambient air)	$\theta_{j-a}$	100	°C/W

\*1: Limited by thermal protection.

## Applications

- Onboard local power supplies
- OA equipment
- For stabilization of the secondary-side output voltage of switching power supplies

## Recommended Operating Conditions

Parameter	Symbol	Ratings		Unit
		SI-8010GL		
DC Input Voltage Range	$V_{IN}$	(8 or $V_O+3$ )*1 to 50		V
Output Voltage Range	$V_O$	1 to 14		V
Output Current Range	$I_O$	0.02 to 1.5*2		A
Operating Junction Temperature Range	$T_{jop}$	-30 to +125		°C
Operating Temperature Range	$T_{op}$	-30 to +125		°C

\*1: The minimum value of an input voltage range is the higher of either 8V or  $V_O+3V$ .

\*2: Please be sure to let the output current run more than 20 mA. When using by less than 20 mA, there is a possibility that the output voltage becomes unstable.

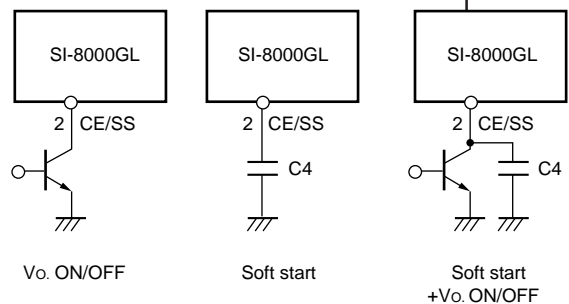
## Electrical Characteristics

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

Parameter	Symbol	Ratings			Unit
		SI-8010GL (Variable type)			
		min.	typ.	max.	
Reference Voltage	$V_{REF}$	0.97	1.00	1.03	V
	Conditions	$V_{IN}=12V, I_O=1A$			
Efficiency	Eff		86		%
	Conditions	$V_{IN}=20V, I_O=1A, V_O=5V$			
Oscillation Frequency	$F_{OSC}$		250		kHz
	Conditions	$V_{IN}=12V, I_O=1A$			
Line Regulation	$\Delta V_{OLINE}$		20	40	mV
	Conditions	$V_{IN}=10$ to $30V, I_O=1A$			
Load Regulation	$\Delta V_{OLOAD}$		10	30	mV
	Conditions	$V_{IN}=12V, I_O=0.1$ to $1.5A$			
Temperature Coefficient of Reference Voltage	$\Delta V_{REF}/\Delta T_a$		$\pm 0.5$		mV/°C
Overcurrent Protection Starting Current	$I_S$	1.6			A
	Conditions	$V_{IN}=12V$			
Quiescent Circuit Current	$I_q$		7		mA
	Conditions	$V_{IN}=12V, I_O=0A$			
Circuit Current at Output OFF	$I_{q(OFF)}$			400	$\mu A$
	Conditions	$V_{IN}=12V, V_{ON/OFF}=0.3V$			
CE/SS* Terminal	Low Level Voltage	$V_{SSL}$		0.5	V
	Terminal Outflow Current at Low Voltage	$I_{SSL}$		50	$\mu A$
		Conditions	$V_{SSL}=0V$		

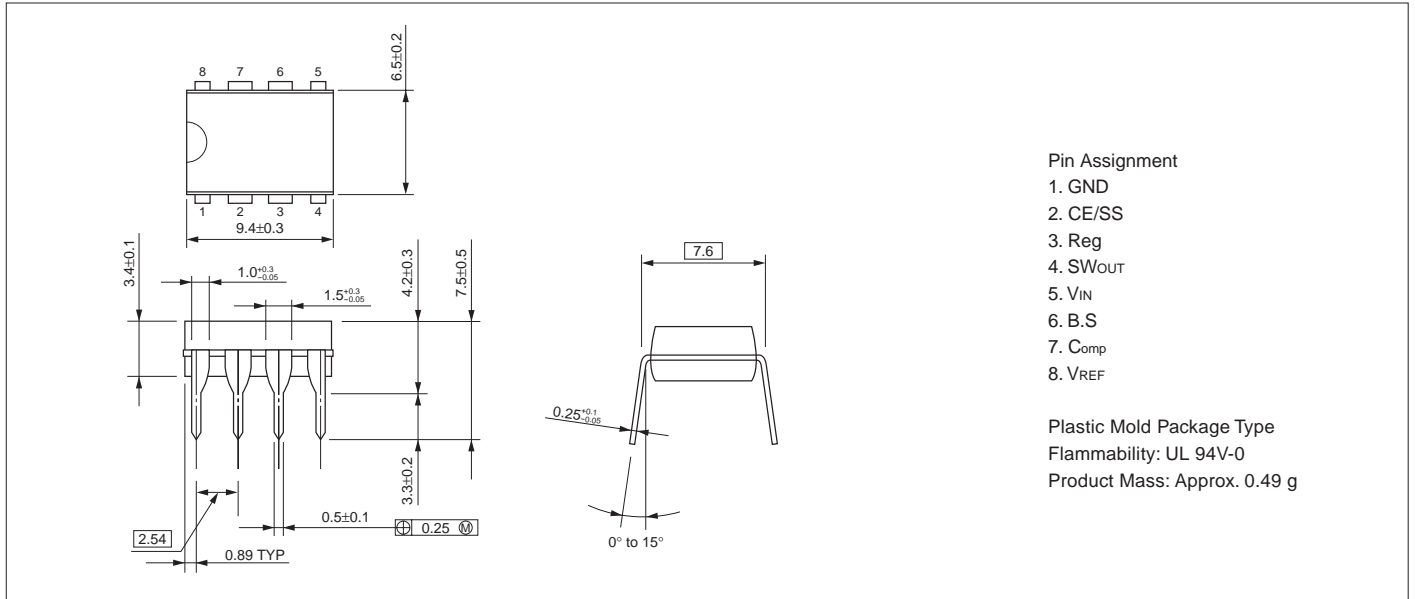
\*: Pin 2 is the CE/SS pin. Soft start at power on can be performed with a capacitor connected to this pin. The output can also be turned ON/OFF with this pin. The output is stopped by setting the voltage of this pin to  $V_{SSL}$  or lower. CE/SS-pin voltage can be changed with an open-collector drive circuit of a transistor.

When using both the soft-start and ON/OFF functions together, the discharge current from  $C_4$  flows into the ON/OFF control transistor. Therefore, limit the current securely to protect the transistor if  $C_3$  capacitance is large. The CE/SS pin is pulled up to the power supply in the IC, so applying the external voltage is prohibited.

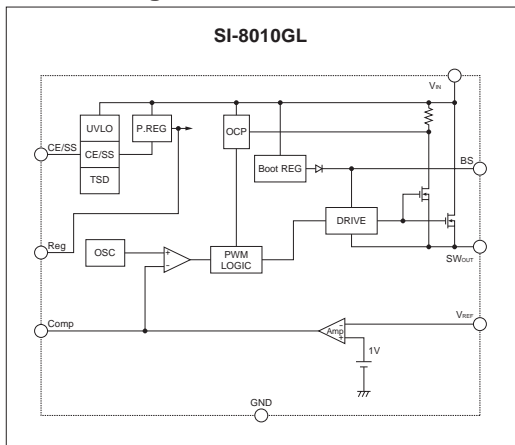


External Dimensions (DIP8)

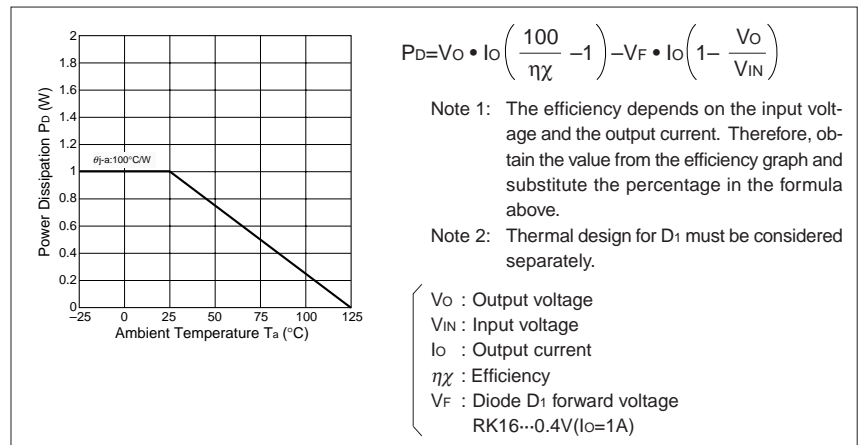
(Unit: mm)



Block Diagram



Ta-Pd Characteristics



Typical Connection Diagram

