

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)	θ_{j-c}	28	°C/W
Thermal Resistance (junction to ambient air)	θ_{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	
		SI-8010GL	
DC Input Voltage Range	V_{IN}	(8 or V_O+3)*1 to 50	
Output Voltage Range	V_O	1 to 14	
Output Current Range	I_O	0.02 to 1.5	
Operating Junction Temperature Range	T_{jop}	-30 to +125	
Operating Temperature Range	T_{op}	-30 to +125	

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

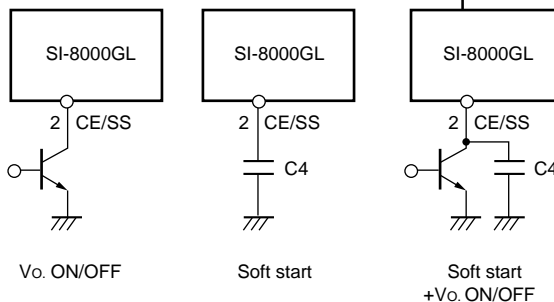
Electrical Characteristics

($T_a=25^\circ C$)

Parameter	Symbol	Ratings			Unit
		SI-8010GL (Variable type)			
		min.	typ.	max.	
Reference Voltage	V_{REF} Conditions	0.97	1.00	1.03	V
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	ΔV_{OLINE}		20	40	mV
	Conditions	$V_{IN}=10$ to 30V, $I_O=1A$			
Load Regulation	ΔV_{OLOAD}		10	30	mV
	Conditions	$V_{IN}=12V, I_O=0.1$ to 1.5A			
Temperature Coefficient of Reference Voltage	$\Delta V_{REF}/\Delta T_a$		± 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	$I_a(OFF)$			400	μA
	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	μA
		Conditions	$V_{SSL}=0V$		

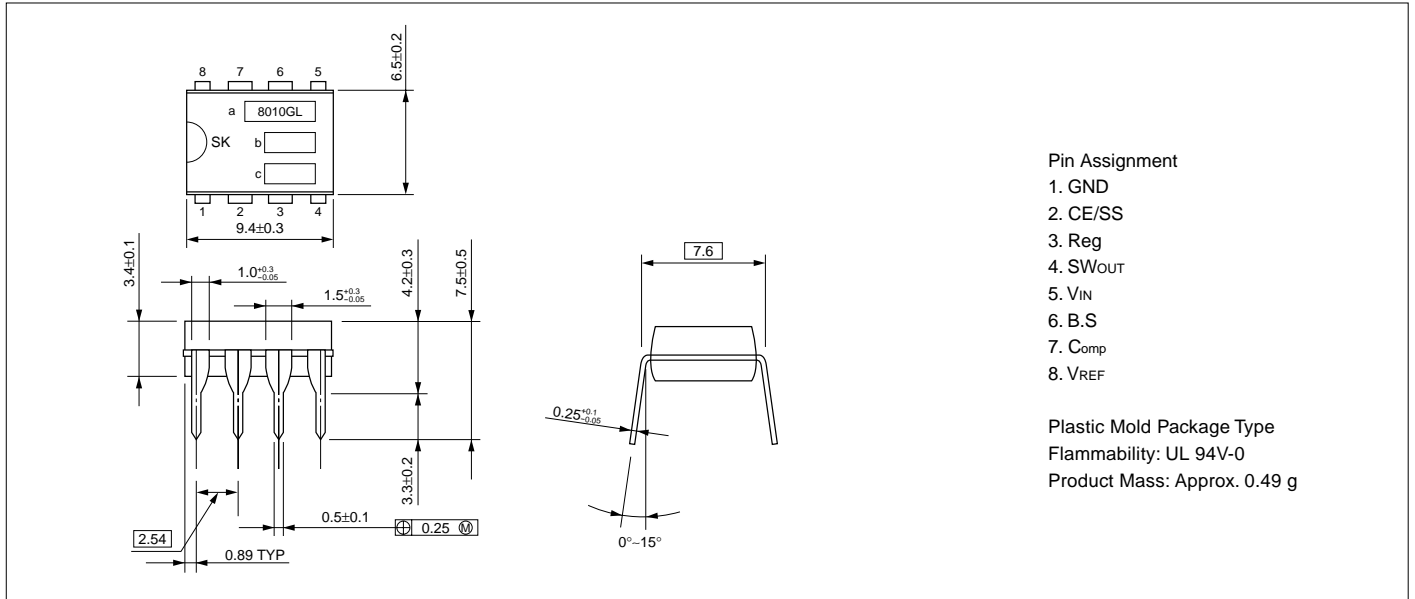
*: Pin 2 is the CE/SS pin. Soft start at power on can be performed with a capacitor connected to this pin. The output can also be turned ON/OFF with this pin. The output is stopped by setting the voltage of this pin to V_{SSL} or lower. CE/SS-pin voltage can be changed with an open-collector drive circuit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

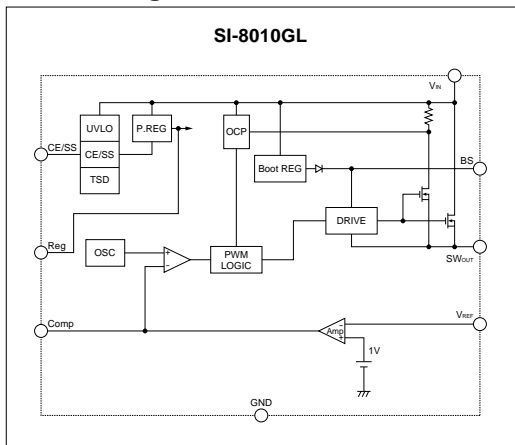


External Dimensions (DIP8)

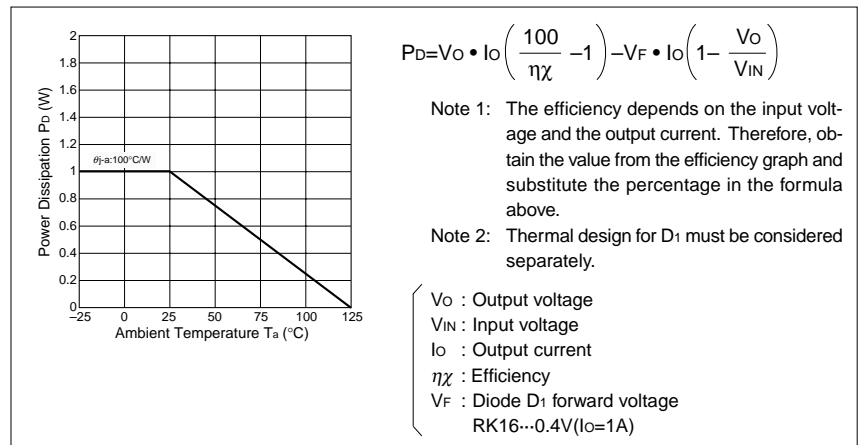
(Unit: mm)



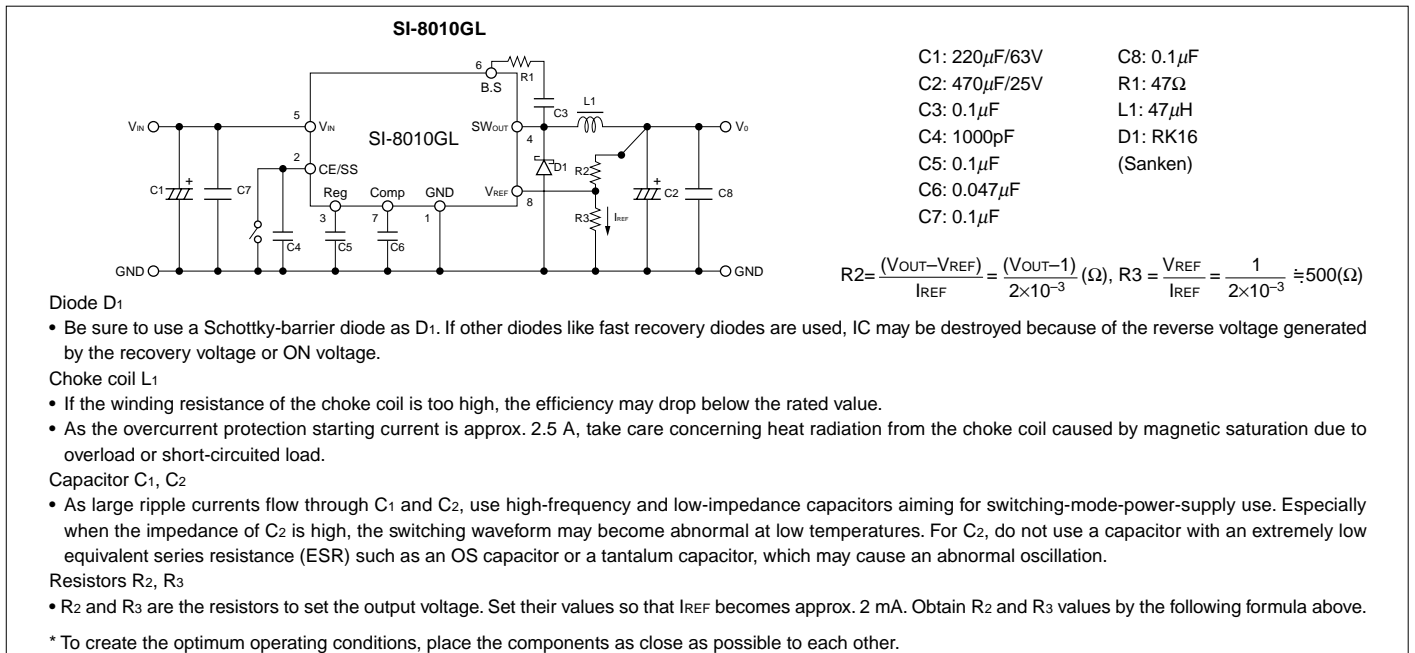
Block Diagram



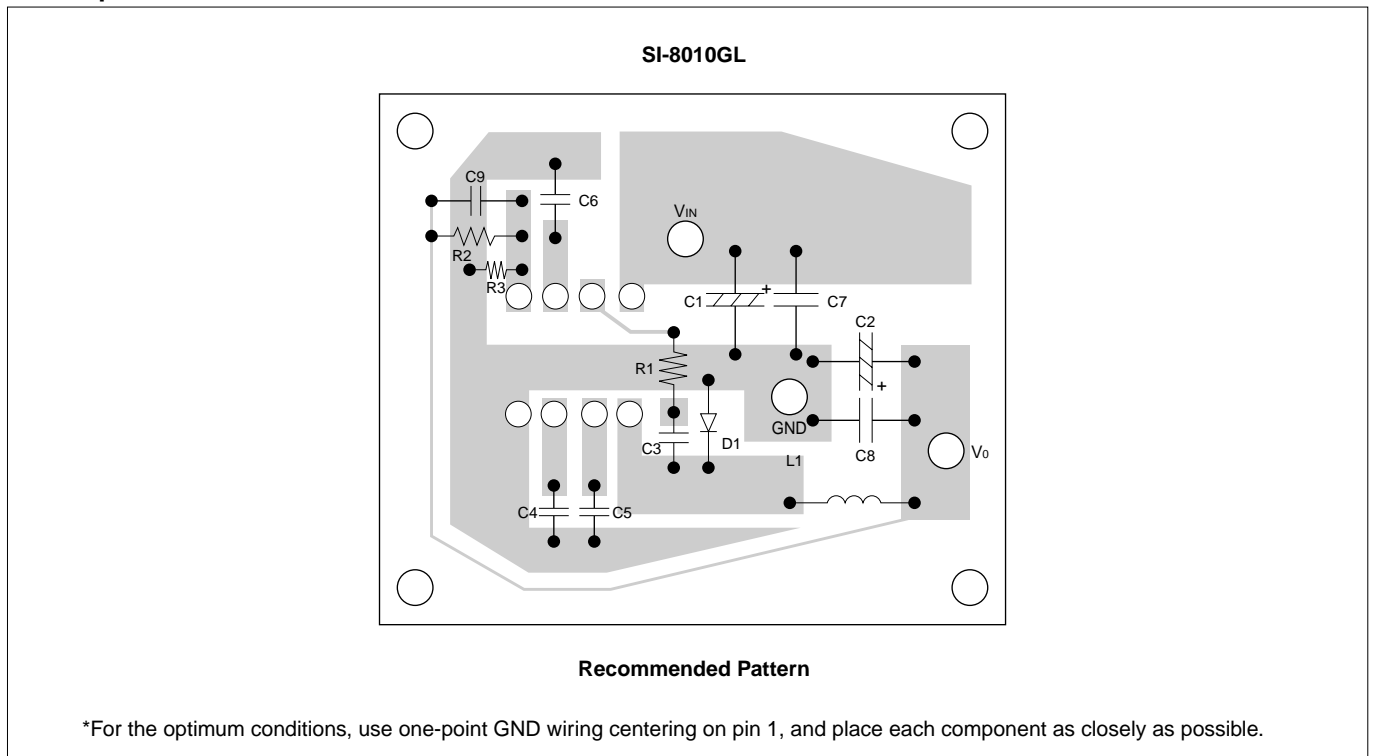
Ta-Pd Characteristics



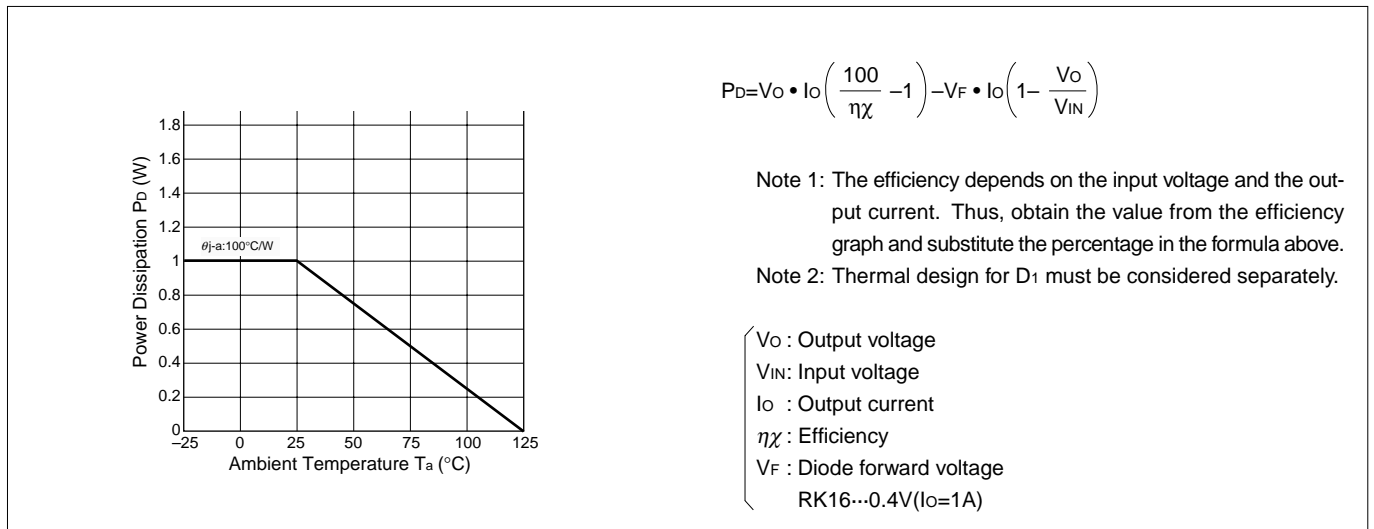
Typical Connection Diagram



■Example of Pattern on PC Board

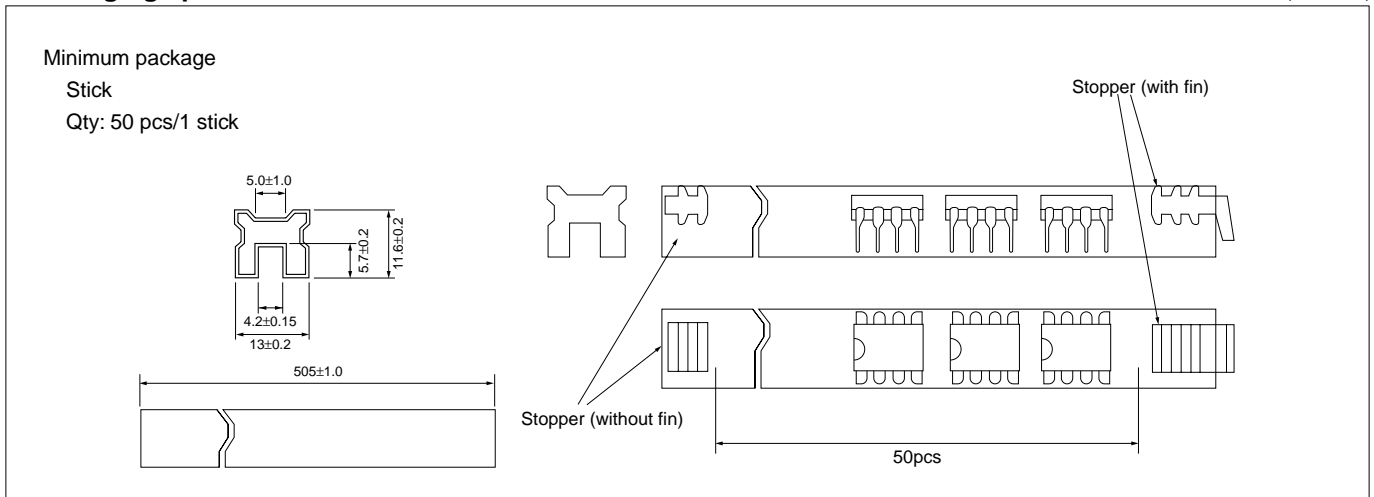


■ T_a - P_D Characteristics



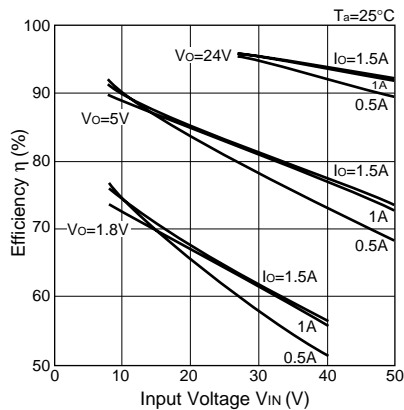
■Packaging specifications

(Unit: mm)

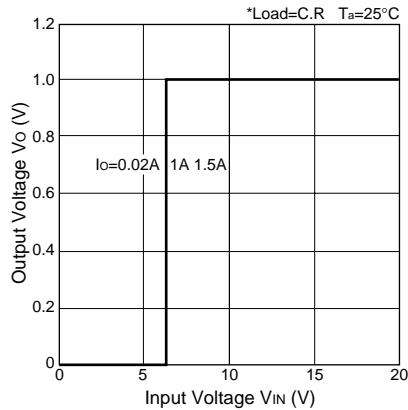


■Typical characteristics (SI-8010GL)

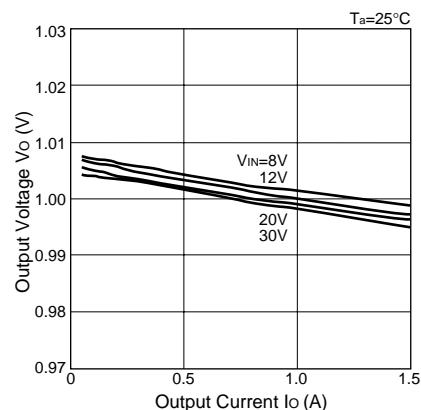
Efficiency Characteristics



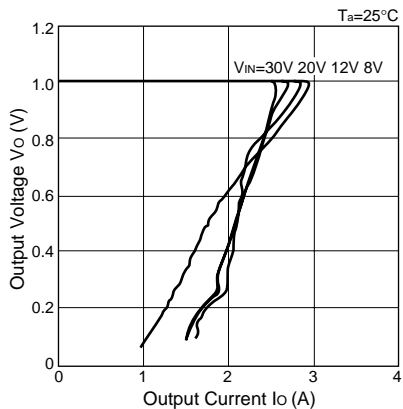
Output Voltage



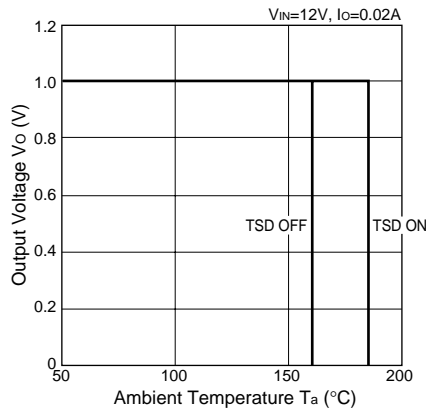
Load Regulation



Overcurrent Protection Characteristics



Thermal Protection Characteristics



Temperature Characteristics

