

# SI-8000HD Series Surface-Mount, Separate Excitation Step-down Switching Mode

## Features

- Surface-mount package (TO263-5)
- Output current: 5.5 A
- High efficiency: 83% (at TYP,  $V_o = 5\text{ V}$ )
- Requires only 5 discrete components (SI-8008HD)
- Built-in reference oscillator (150 kHz)
- Built-in drooping-type overcurrent and thermal protection circuits
- Built-in soft start circuit (Output ON/OFF available)
- Low current consumption during off

## Applications

- DVD recorder, FPD-TV
- Onboard local power supplies
- OA equipment

## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Input Voltage	$V_{IN}$	43	V	
Power Dissipation <sup>*1</sup>	$P_D$	3	W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)
Junction Temperature <sup>*2</sup>	$T_J$	+150	°C	
Storage Temperature	$T_{stg}$	-40 to +150	°C	
Thermal Resistance (Junction to Case)	$\theta_{j-c}$	3	°C/W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)
Thermal Resistance (Junction to Ambient Air)	$\theta_{j-a}$	33.3	°C/W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)

\*1: Limited by thermal protection circuit

\*2: This product has built-in thermal protection circuits that may activate when the junction temperature exceeds 130°C. The recommended design for the junction temperature during IC operation is below 125°C.

## Recommended Operating Conditions

Parameter	Symbol	Ratings	Unit	Conditions
		SI-8008HD		
Input Voltage Range	$V_{IN}$	$V_o+3^{*1}$ to 40	V	
Output Voltage Range	$V_o$	0.8 to 24	V	
Output Current Range	$I_o$	0 to 5.5	A	$V_{IN} \geq V_o+3V$
Operating Junction Temperature Range	$T_{jop}$	-30 to +100	°C	
Operating Temperature Range	$T_{op}$	-30 to +85	°C	

\*1: The minimum value of the input voltage range is 4.5 V or  $V_o+3\text{ V}$ , whichever is higher.

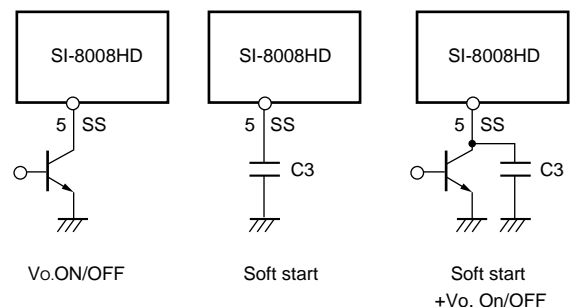
## Electrical Characteristics

( $R_1=4.2\text{ k}\Omega$ ,  $R_2=0.8\text{ k}\Omega$  when  $T_a=25^\circ\text{C}$  and  $V_o=5\text{ V}$ )

Parameter	Symbol	Ratings			Unit
		SI-8008HD			
		min.	typ.	max.	
Reference Voltage	$V_{ADJ}$	0.784	0.800	0.816	V
Temperature Coefficient of Reference Voltage	$(\Delta V_{ADJ}/\Delta T)$		$\pm 0.1$		mV/°C
	Conditions	$V_{IN}=15\text{ V}$ , $I_o=1\text{ A}$ , $T_c=0$ to $100^\circ\text{C}$			
Efficiency	$\eta$		83		%
	Conditions	$V_{IN}=15\text{ V}$ , $I_o=3\text{ A}$			
Oscillation Frequency	$f_o$		150		kHz
	Conditions	$V_{IN}=15\text{ V}$ , $I_o=3\text{ A}$			
Line Regulation	$\Delta V_{OLINE}$		60	80	mV
	Conditions	$V_{IN}=10$ to $30\text{ V}$ , $I_o=3\text{ A}$			
Load Regulation	$\Delta V_{OLOAD}$		20	50	mV
	Conditions	$V_{IN}=15\text{ V}$ , $I_o=0.2$ to $5.5\text{ A}$			
Overcurrent Protection Starting Current	$I_s$	5.6	6.5	7.5	A
	Conditions	$V_{IN}=15\text{ V}$			
SS Pin <sup>*1</sup>	Low Level Voltage	$V_{SSL}$		0.5	V
	Outflow Current at Low Voltage	$I_{SSL}$		10	30
Quiescent Circuit Current		$I_q$		6	
	Conditions		$V_{IN}=15\text{ V}$ , $I_o=0\text{ A}$		
	$I_{q(OFF)}$		200	400	$\mu\text{A}$
		Conditions	$V_{IN}=15\text{ V}$ , $V_{SS}=0\text{ V}$		

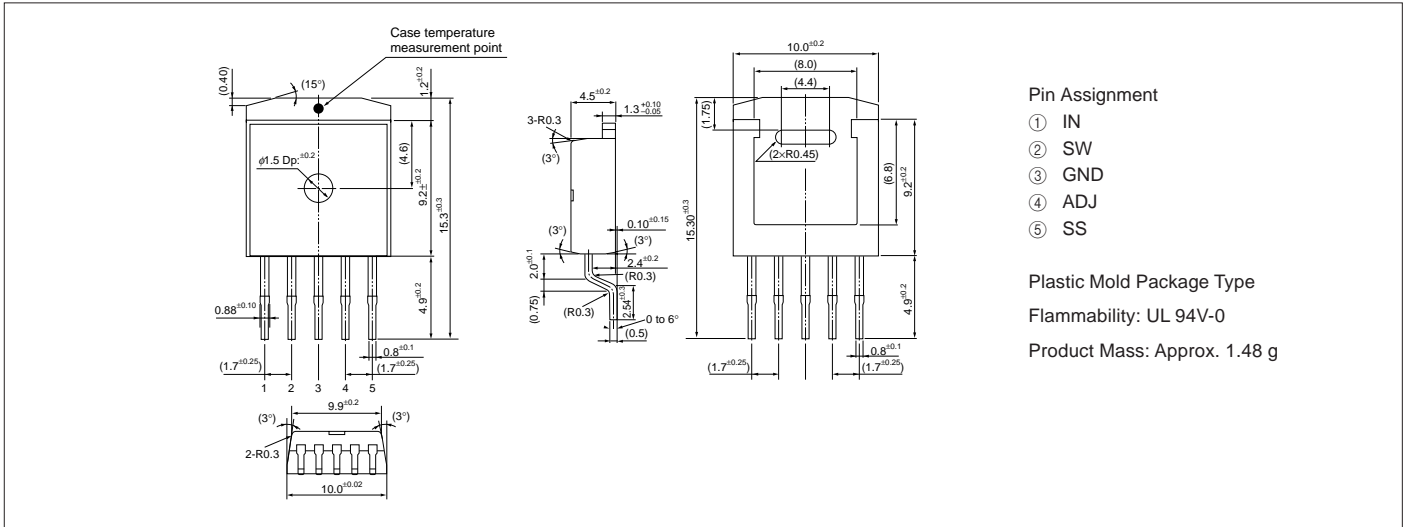
\*1: Pin 5 is the SS pin. Soft start at power on can be performed with a capacitor connected to this pin. The output can also be turned ON/OFF with this pin.

The output is stopped by setting the voltage of this pin to  $V_{SSL}$  or lower. 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 C3 flows into the ON/OFF control transistor. Therefore, limit the current securely to protect the transistor if C3 capacitance is large. The SS pin is pulled up (3.7 V typ.) to the power supply in the IC, so applying the external voltage is prohibited. If this pin is not used, leave it open.

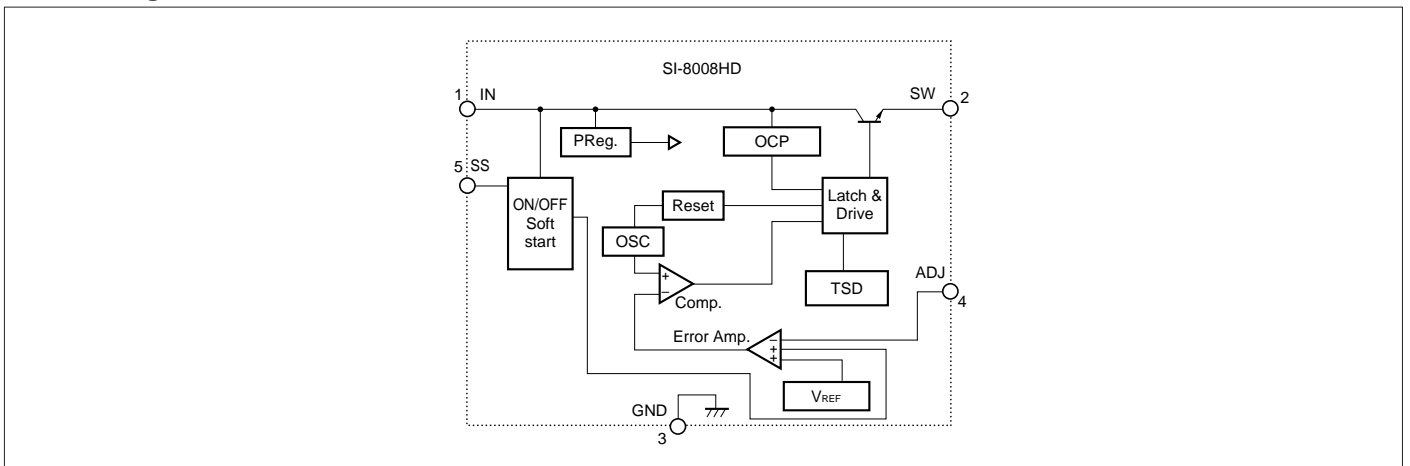


External Dimensions (TO263-5)

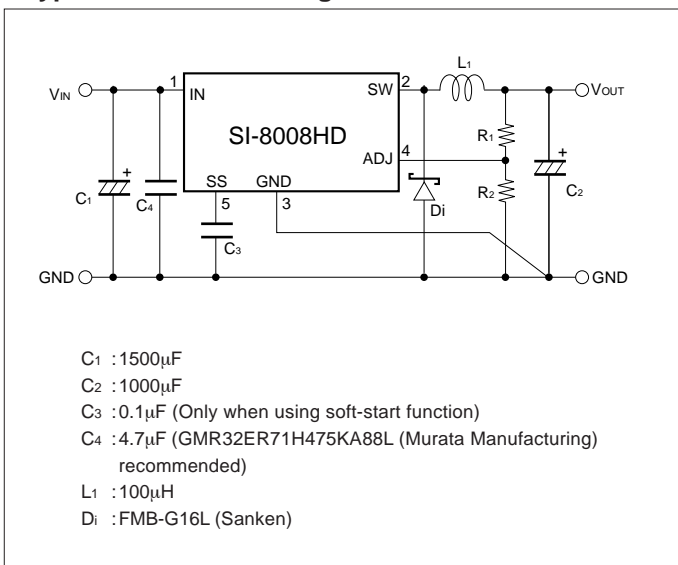
(Unit : mm)



Block Diagram



Typical Connection Diagram



Reference Data

