

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 ^{*1}	P_D	3	W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)
Junction Temperature ^{*2}	T_J	+150	°C	
Storage Temperature	T_{stg}	-40 to +150	°C	
Thermal Resistance (Junction to Case)	θ_{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)	θ_{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.

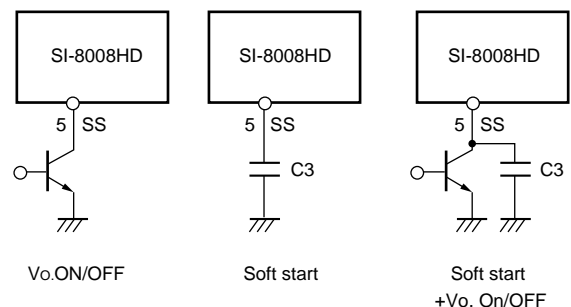
Electrical Characteristics

($R1=4.2k\Omega$, $R2=0.8k\Omega$ 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	$(\Delta V_{ADJ}/\Delta T)$		± 0.1		mV/°C
	Conditions	$V_{IN}=15\text{V}$, $I_o=1\text{A}$, $T_c=0$ to 100°C			
Efficiency	η		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	ΔV_{OLINE}		60	80	mV
	Conditions	$V_{IN}=10$ to 30V , $I_o=3\text{A}$			
Load Regulation	ΔV_{OLOAD}		20	50	mV
	Conditions	$V_{IN}=15\text{V}$, $I_o=0.2$ to 5.5A			
Overcurrent Protection Starting Current	I_s	5.6	6.5	7.5	A
	Conditions	$V_{IN}=15\text{V}$			
SS Pin ^{*1}	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	μA
		Conditions	$V_{IN}=15\text{V}$, $V_{SS}=0\text{V}$		

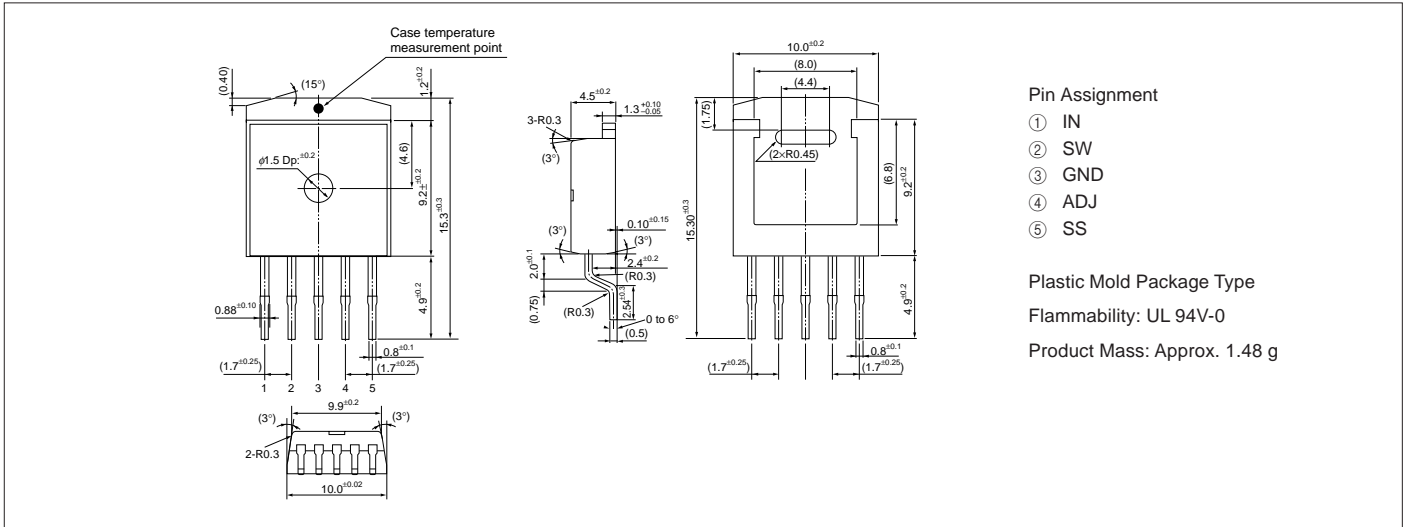
*1: Pin 5 is the SS pin. Soft start at power on can be performed with a capacitor connected to this pin. The output can also be turned ON/OFF with this pin.

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.

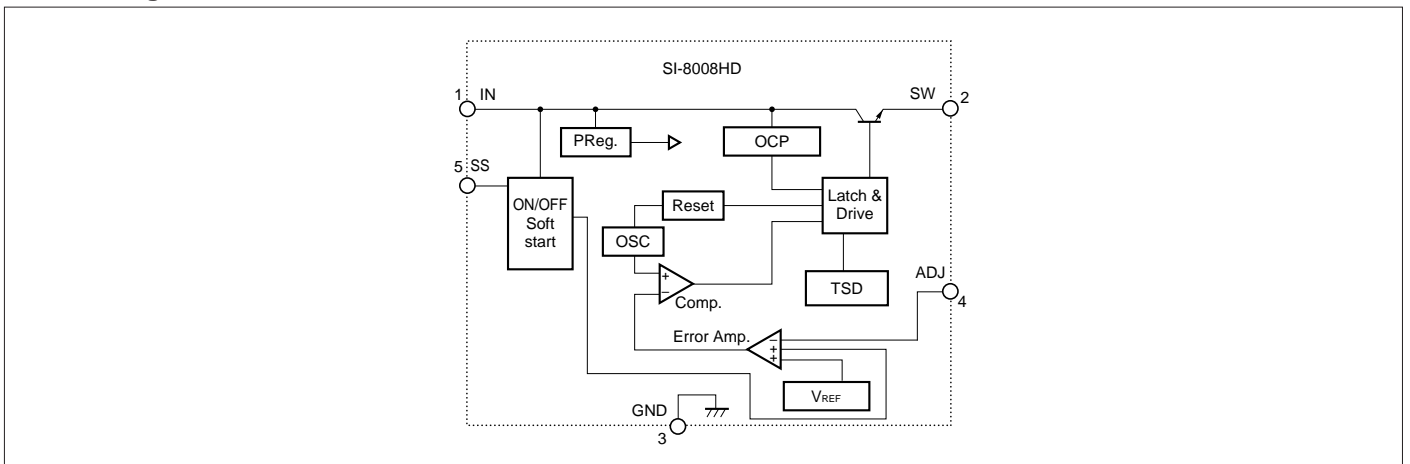


External Dimensions (TO263-5)

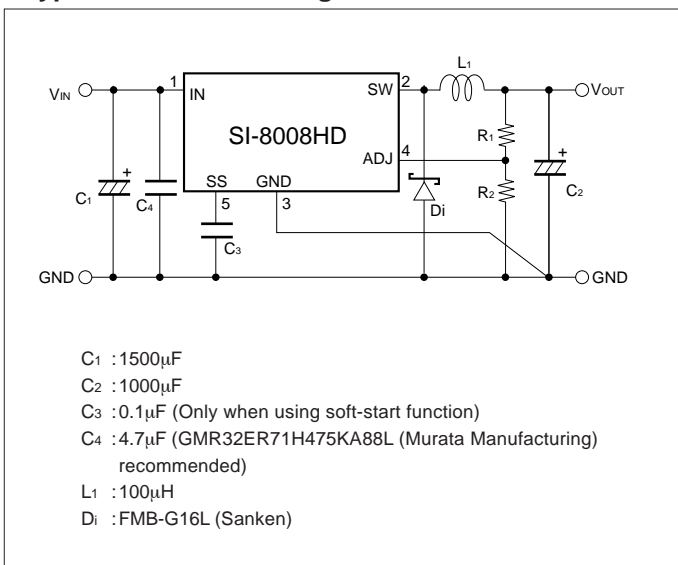
(Unit : mm)



Block Diagram



Typical Connection Diagram



Reference Data

The acceptable loss of the package is 3 W for the SI-8000HD series, so some ranges are not available, depending on the relation between the input voltage and output current.

