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, Vo = 5 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}	Vo+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	$V_{IN} \geq Vo+3V$
Operating Junction Temperature Range	T_{jop}	–30 to +100	°C	
Operating Temperature Range	T_{op}	–30 to +85	°C	

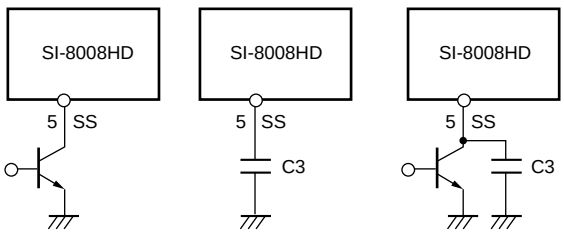
*1: The minimum value of the input voltage range is 4.5 V or Vo+3 V, whichever is higher.

■Electrical Characteristics

(R1=4.2kΩ, R2=0.8kΩ when Ta=25°C and Vo=5V)

Paramter		Symbol	Ratings SI-8008HD min.	typ.	max.	Unit
Reference Voltage		V_{ADJ}	0.784	0.800	0.816	V
		Conditions	V_{IN}=15V, Io=1A			
Temperature Coefficient of Reference Voltage		$(\Delta V_{ADJ}/\Delta T)$		±0.1		mV/°C
		Conditions	V_{IN}=15V, Io=1A, Tc=0 to 100°C			
Efficiency		η		83		%
		Conditions	V_{IN}=15V, Io=3A			
Oscillation Frequency		fo		150		kHz
		Conditions	V_{IN}=15V, Io=3A			
Line Regulation		ΔV_{OLINE}		60	80	mV
		Conditions	V_{IN}=10 to 30V, Io=3A			
Load Regulation		ΔV_{OLOAD}		20	50	mV
		Conditions	V_{IN}=15V, Io=0.2 to 5.5A			
Overcurrent Protection Starting Current		I_S	5.6	6.5	7.5	A
		Conditions	V_{IN}=15V			
SS Pin*1	Low Level Voltage	V_{SSL}			0.5	V
	Outflow Current at Low Voltage	I_{SSL}		10	30	µA
		Conditions	V_{SSL}=0V			
Quiescent Circuit Current		I_q		6		mA
		Conditions	V_{IN}=15V, Io=0A			
		$I_{q(OFF)}$		200	400	µA
		Conditions	V_{IN}=15V, V_{SS}=0V			

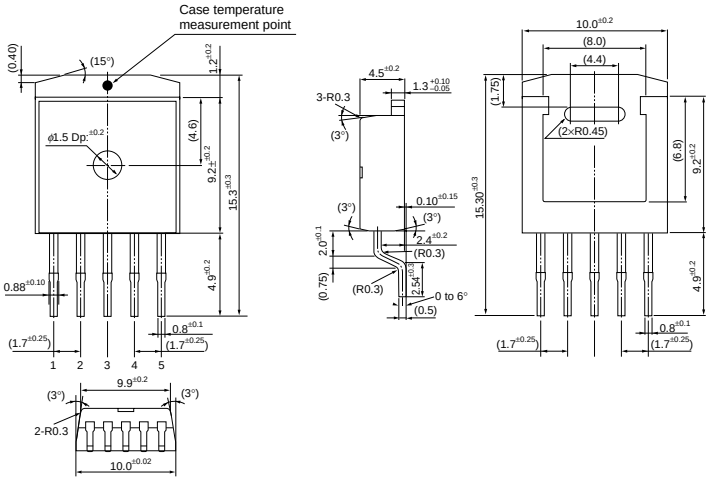
*1: Pin 5 is the SS pin. Soft start at power on can be performed with a capacitor connected to this pin. The output can also be turned ON/OFF with this pin.
The output is stopped by setting the voltage of this pin to VSSL or lower. SS-pin voltage can be changed with an open-collector drive circuit of 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.



Vo.ON/OFF　　Soft start　　Soft start +Vo. On/OFF

■External Dimensions (TO263-5)

(Unit : mm)



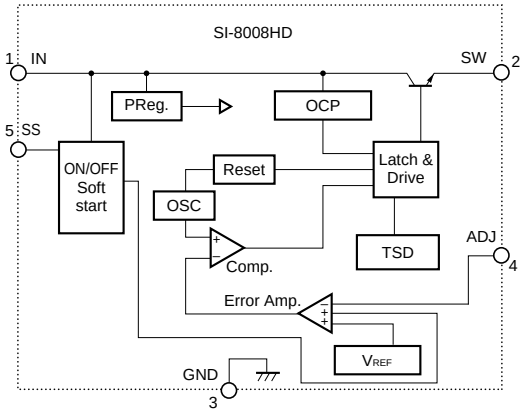
Pin Assignment
① IN
② SW
③ GND
④ ADJ
⑤ SS

Plastic Mold Package Type

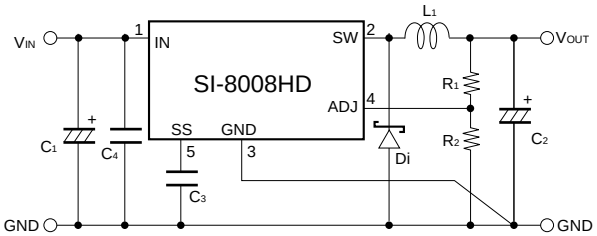
Flammability: UL 94V-0

Product Mass: Approx. 1.48 g

■Block Diagram



■Typical Connection Diagram



C1 : 1500μF
C2 : 1000μF
C3 : 0.1μF (Only when using soft-start function)
C4 : 4.7μF (GMR32ER71H475KA88L (Murata Manufacturing) recommended)
L1 : 100μH
Di : FMB-G16L (Sanken)

■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.

