

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	VIN	43	V	
Power Dissipation ^{*1}	Pd	3	W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)
Junction Temperature ^{*2}	Tj	+150	°C	
Storage Temperature	Tstg	−40 to +150	°C	
Thermal Resistance (Junction to Case)	θj-c	3	°C/W	When mounted on glass-epoxy board measuring 40×40 mm (copper laminate area: 100%)
Thermal Resistance (Junction to Ambient Air)	θj-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	VIN	Vo+3 ^{*1} to 40	V	
Output Voltage Range	Vo	0.8 to 24	V	
Output Current Range	Io	0 to 5.5	A	VIN ≥ Vo+3V
Operating Junction Temperature Range	Tjop	−30 to +100	°C	
Operating Temperature Range	Top	−30 to +85	°C	

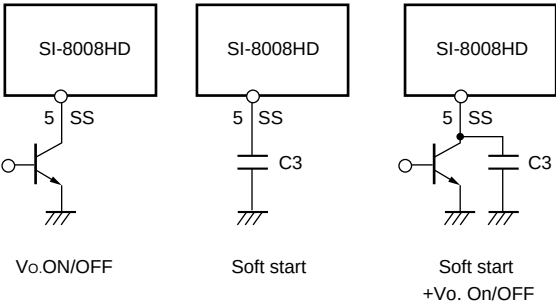
*1: The minimum value of the input voltage range is 4.5 V or Vo+3 V, whichever is higher.

Electrical Characteristics

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

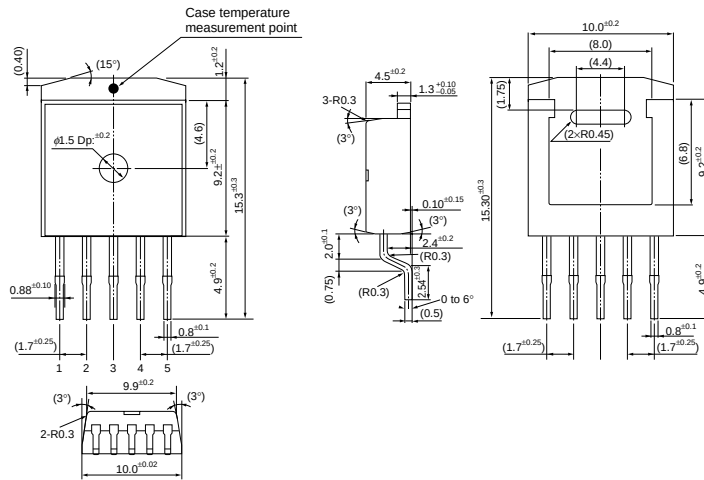
Paramter		Symbol	Ratings			Unit
			SI-8008HD			
			min.	typ.	max.	
Reference Voltage		V _{ADJ}	0.784	0.800	0.816	V
		Conditions	V _{IN} =15V, I _o =1A			
Temperature Coefficient of Reference Voltage		(ΔV _{ADJ} /ΔT)		±0.1		mV/°C
		Conditions	V _{IN} =15V, I _o =1A, T _c =0 to 100°C			
Efficiency		η		83		%
		Conditions	V _{IN} =15V, I _o =3A			
Oscillation Frequency		f _o		150		kHz
		Conditions	V _{IN} =15V, I _o =3A			
Line Regulation		ΔV _{OLINE}		60	80	mV
		Conditions	V _{IN} =10 to 30V, I _o =3A			
Load Regulation		ΔV _{OLOAD}		20	50	mV
		Conditions	V _{IN} =15V, I _o =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, I _o =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.



External Dimensions (TO263-5)

(Unit : mm)



Pin Assignment

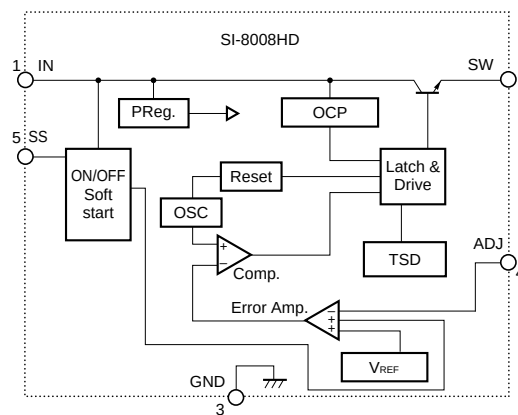
- ① IN
- ② SW
- ③ GND
- ④ ADJ
- ⑤ SS

Plastic Mold Package Type

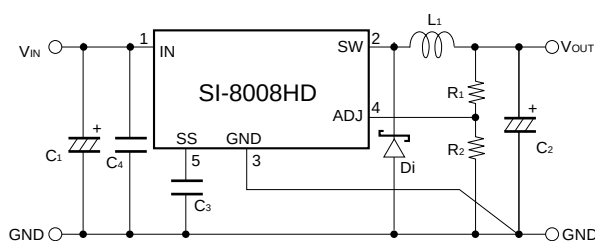
Flammability: UL 94V-0

Product Mass: Approx. 1.48 g

Block Diagram



Typical Connection Diagram



- C1 : 1500 μ F
- C2 : 1000 μ F
- C3 : 0.1 μ F (Only when using soft-start function)
- C4 : 4.7 μ F (GMR32ER71H475KA88L (Murata Manufacturing) recommended)
- L1 : 100 μ H
- D1 : 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.

