

SI-8000Q Series Surface Mount, Current Mode Control Step-down Switching Mode

■ Features

- Compact surface-mount package (HSOP8)
- Introduction of current mode control method
- Output current: 3.5A
- High efficiency: 90% (Vo = 5 V)
- Built-in reference oscillator (500 kHz)
- A ceramic capacitor can be used for output
- Built-in drooping-type over current and thermal protection circuits
- Built-in soft start circuit
- Built-in on/off function (Active Hi)
- Low current consumption during off

■ Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Input Voltage	V _{IN}	30	V	
Power Dissipation*1	PD	1.35	W	When mounted on glass-epoxy board, 30x30 mm (copper laminate area : 25x25 mm)
Junction Temperature*2	T _j	-30 to +1 50	°C	
Storage Temperature	T _{stg}	-40 to +1 50	°C	
Thermal Resistance (junction to case)	θ _{j-c}	40	°C/W	
Thermal Resistance (junction to ambient air)	θ _{j-a}	74	°C/W	When mounted on glass epoxy board, 30x30mm (copper laminate area : 25x25 mm)

*1 : Limited by thermal protection circuit

*2: Note that the detection temperature for thermal protection is about 140°C.

■ Applications

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

■ Recommended Operating Conditions

Parameter	Symbol	Ratings	Unit	Conditions
		SI-8005Q		
DC Input Voltage Range	V _{IN}	Vo+3*1 to 28	V	
Output Voltage Range	V _O	0.5 to 24	V	
Output Current Range	I _O	0to3.5	A	
Operating Junction Temperature Range	T _{op}	-30 to +125	°C	
Operating Temperature Range	T _{op}	-30 to +85	°C	

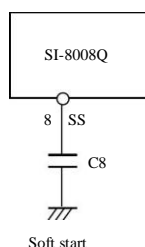
*1 : The minimum value of the input voltage range is 4.75 V or Vo +3 V, whichever is higher.

■ Electrical Characteristics

(R1=46kΩ, R2=5.1kΩ when Ta = 25°C and Vo=5V)

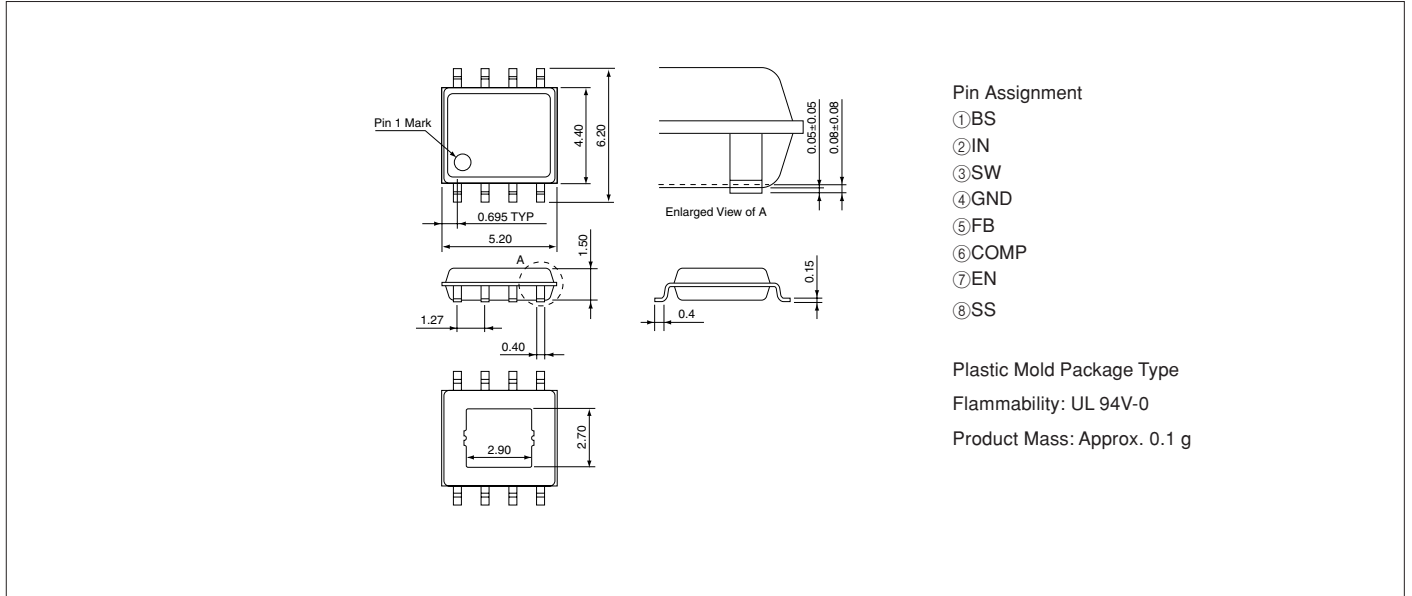
Parameter	Symbol	Rating			Unit
		SI-8005Q			
		min.	typ.	max.	
Reference Voltage	V _{ADJ}	0.485	0.500	0.515	V
Conditions	V _{IN} =12V, I _O =1A				
Temperature Coefficient of Reference Voltage	ΔV _{ADJ} /ΔT		0.05		mV/°C
Conditions	V _{IN} =12V, I _O =1 A, Ta=-40 to +85°C				
Efficiency	η		90		%
Conditions	V _{IN} =12V, I _O =1A				
Oscillation Frequency	f _o	450	500	550	kHz
Conditions	V _{IN} =16V, I _O =1A				
Line Regulation	ΔV _{OLNE}		30	60	mV
Conditions	V _{IN} =8 to 28V, I _O =1 A				
Load Regulation	ΔV _{OLAD}		30	60	mV
Conditions	V _{IN} =12V, I _O =0.1 to 3.5A				
Over current Protection Starting Current	I _S	3.6		6.0	A
Conditions	V _{IN} =12V				
Quiescent Circuit Current	I _q		18		mA
	Conditions	V _{IN} =12V, I _O =0A, V _{EN} =open			
	I _{q(OFF)}			20	μA
Conditions	V _{IN} =12V, I _O =0A, V _{EN} =0V				
SS Pin	Outflow Current at Low Voltage	I _{SSL}	5		μA
Conditions	V _{IN} =1 6V, V _{SSL} =0V				
EN Pin	High Level Voltage	V _{c/N}	2.8		V
	Conditions	V _{IN} =12V			
	Low Level Voltage	V _{c/L}		2.2	V
Conditions	V _{IN} =12V				
Inflow Current at Low Low Voltage	I _{C, E H}		5		μA
	Conditions	V _{EN} =0V			
Error Amplifier Voltage Gain	AEA		1000		V/V
Error Amplifier Transformer Conductance	GEA		800		μA/V
Current Sense Amplifier Impedance	1/GCS		0.35		V/A
Maximum ON Duty	D _{MAX}		92		%
Minimum ON Time	D _{MIN}		100		nsec.

*: Pin 8 is the SS pin. Soft start at power on can be performed with a capacitor connected to this pin. The SS pin is pulled up to the power supply in the IC, so applying the external voltage is prohibited.

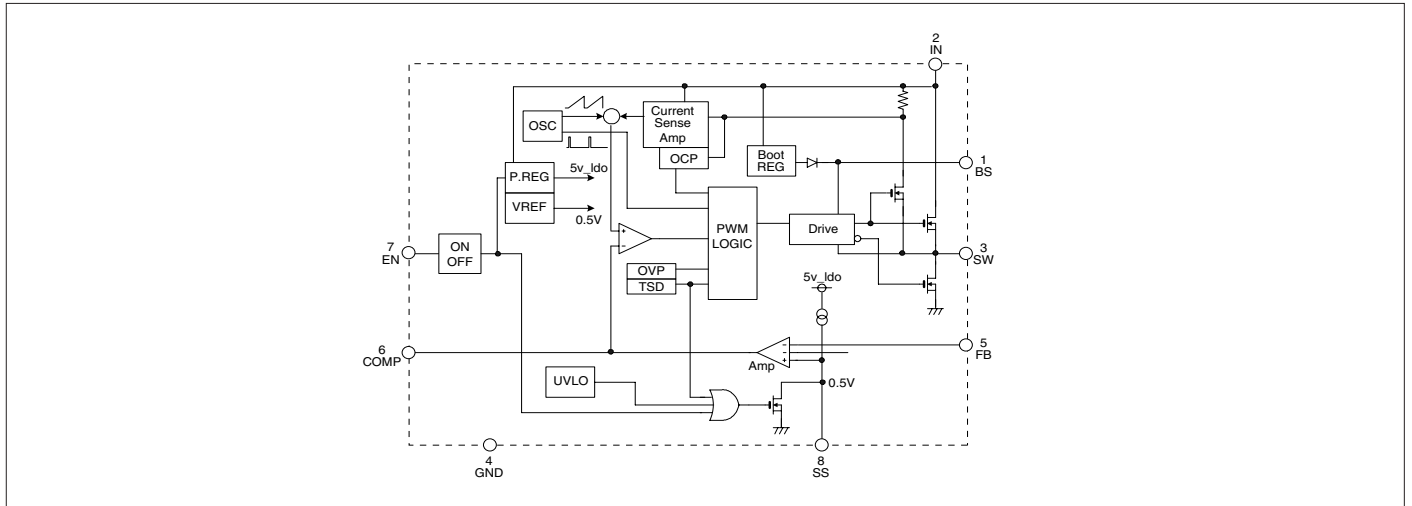


External Dimensions (HSOP8)

(Unit : mm)



Block Diagram



Typical Connection Diagram

