

# 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 <sub>IN</sub>	30	V	
Power Dissipation*1	PD	1.35	W	When mounted on glass-epoxy board, 30×30 mm (copper laminate area : 25×25 mm)
Junction Temperature*2	T <sub>J</sub>	-30 to +1 50	°C	
Storage Temperature	T <sub>stg</sub>	-40 to +1 50	°C	
Thermal Resistance (junction to case)	θ <sub>J-C</sub>	40	°C/W	
Thermal Resistance (junction to ambient air)	θ <sub>J-A</sub>	74	°C/W	When mounted on glass epoxy board, 30×30mm (copper laminate area : 25×25 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 <sub>IN</sub>	Vo+3*1 to 28	V	
Output Voltage Range	V <sub>O</sub>	0.5 to 24	V	
Output Current Range	I <sub>O</sub>	0to3.5	A	
Operating Junction Temperature Range	T <sub>OP</sub>	-30 to +125	°C	
Operating Temperature Range	T <sub>OP</sub>	-30 to +85	°C	

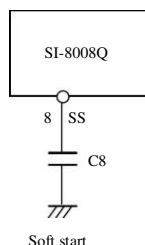
\*1 : The minimum value of the input voltage range is 4.75 V or Vo +3 V, whichever is higher.

## ■ Electrical Characteristics

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

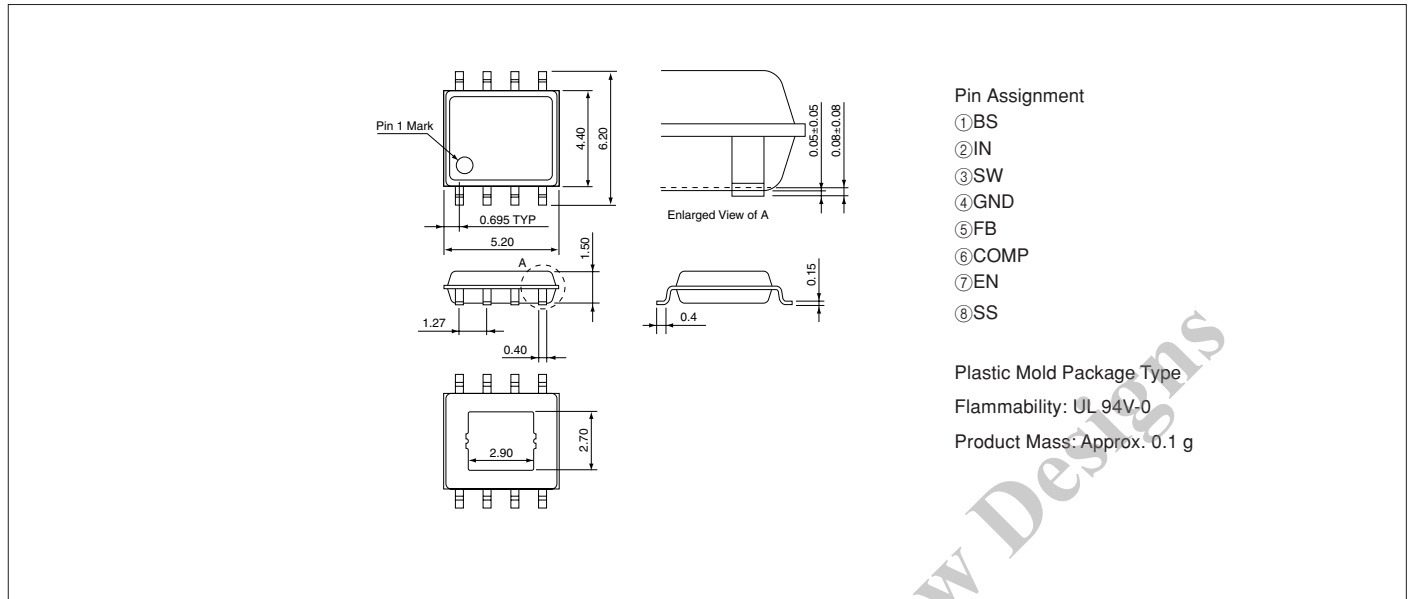
Parameter	Symbol	Rating			Unit
		SI-8005Q			
		min.	typ.	max.	
Reference Voltage	V <sub>ADJ</sub>	0.485	0.500	0.515	V
Temperature Coefficient of Reference Voltage	ΔV <sub>ADJ</sub> /ΔT	Conditions			mV/°C
		V <sub>IN</sub> =12V, I <sub>O</sub> =1A, Ta=-40 to +85°C			
Efficiency	η	Conditions			%
		V <sub>IN</sub> =12V, I <sub>O</sub> =1A			
Oscillation Frequency	f <sub>o</sub>	450	500	550	kHz
		Conditions: V <sub>IN</sub> =16V, I <sub>O</sub> =1A			
Line Regulation	ΔV <sub>OLINE</sub>	Conditions			mV
		V <sub>IN</sub> =8 to 28V, I <sub>O</sub> =1 A			
Load Regulation	ΔV <sub>OLAD</sub>	Conditions			mV
		V <sub>IN</sub> =12V, I <sub>O</sub> =0.1 to 3.5A			
Over current Protection Starting Current	I <sub>S</sub>	3.6		6.0	A
		Conditions: V <sub>IN</sub> =12V			
Quiescent Circuit Current	I <sub>q</sub>	Conditions			mA
		V <sub>IN</sub> =12V, I <sub>O</sub> =0A, V <sub>EN</sub> =open			
	I <sub>q(OFF)</sub>		20		μA
		Conditions: V <sub>IN</sub> =12V, I <sub>O</sub> =0A, V <sub>EN</sub> =0V			
SS Pin	Outflow Current at Low Voltage	I <sub>SSL</sub>	5		μA
		Conditions: V <sub>IN</sub> =1 6V, V <sub>SSL</sub> =0V			
EN Pin	High Level Voltage	V <sub>C/N</sub>	2.8		V
			Conditions: V <sub>IN</sub> =12V		
	Low Level Voltage	V <sub>C/L</sub>		2.2	V
		Conditions: V <sub>IN</sub> =12V			
Inflow Current at Low Low Voltage	I <sub>C, E H</sub>	Conditions			μA
		V <sub>EN</sub> =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 <sub>MAX</sub>		92		%
Minimum ON Time	D <sub>MIN</sub>		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.

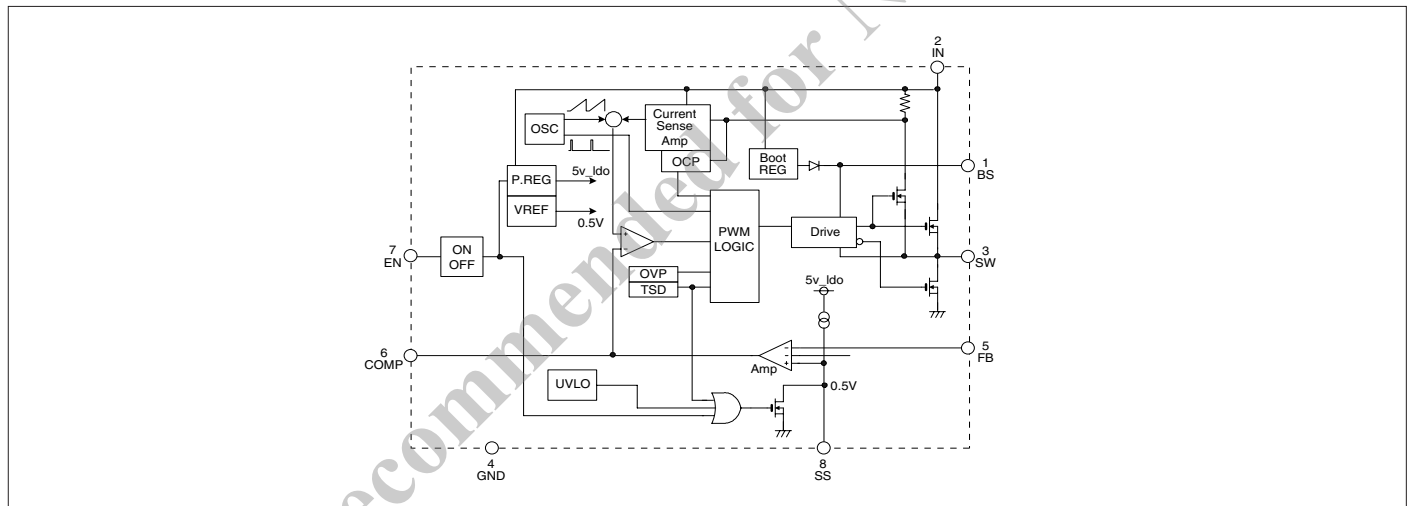


External Dimensions (HSOP8)

(Unit : mm)



Block Diagram



Typical Connection Diagram

