

**SI-8205NHD****Surface-Mount, Current Mode Control, Synchronous Rectifier Step-down Switching Mode****■ Features**

- Compact surface-mount (HSOP8) package
- Wide input voltage range ( $V_{IN}$ ):  $V_o + 3$  to 43 V
- Synchronous rectifier mode
- Output current: 3 A
- Reference voltage and accuracy of 0.5 V  $\pm$  1%
- Oscillation frequency: 200 kHz to 1 MHz
- A ceramic capacitor can be used for output
- Output can be disabled
- Undervoltage Lock Out
- Soft start function

**■ Applications**

- Power supply for LCD module
- Power supply for notebook PC
- Onboard local power supplies
- Power supply for LBP/PPC

**■ Absolute Maximum Ratings**

Parameter	Symbol	Ratings	Unit	Conditions
Input Voltage (VIN Pin)	$V_{IN}$	46	V	
Power Dissipation	$P_D$	1.35	W	When mounted on a 30 x 30 mm glass-epoxy board (with a 25 x 25 mm copper area)
Junction Temperature	$T_j$	-40 to +150	°C	
Storage Temperature	$T_{stg}$	-40 to +150	°C	
Thermal Resistance (Junction to Lead <1 pin>)	$\theta_{j-c}$	40	°C/W	
Thermal Resistance (Junction to Ambient Air)	$\theta_{j-a}$	74	°C/W	When mounted on a 30 x 30 mm glass-epoxy board (with a 25 x 25 mm copper area)

**■ Recommended Operating Conditions**

Parameter	Symbol	Ratings	Unit
Input Voltage Range	$V_{IN}$	8 or $V_o + 3$ to 43	V
Output Current Range	$I_o$	0 to 3.0	A
Output Voltage Range	$V_o$	0.5 to 24	V
Operating Junction Temperature Range	$T_{jop}$	-40 to +125	°C
Operating Temperature Range	$T_{op}$	-40 to +85	°C

\*: The minimum value of the input voltage range is 8 V or  $V_o + 3$ V, whichever is higher.

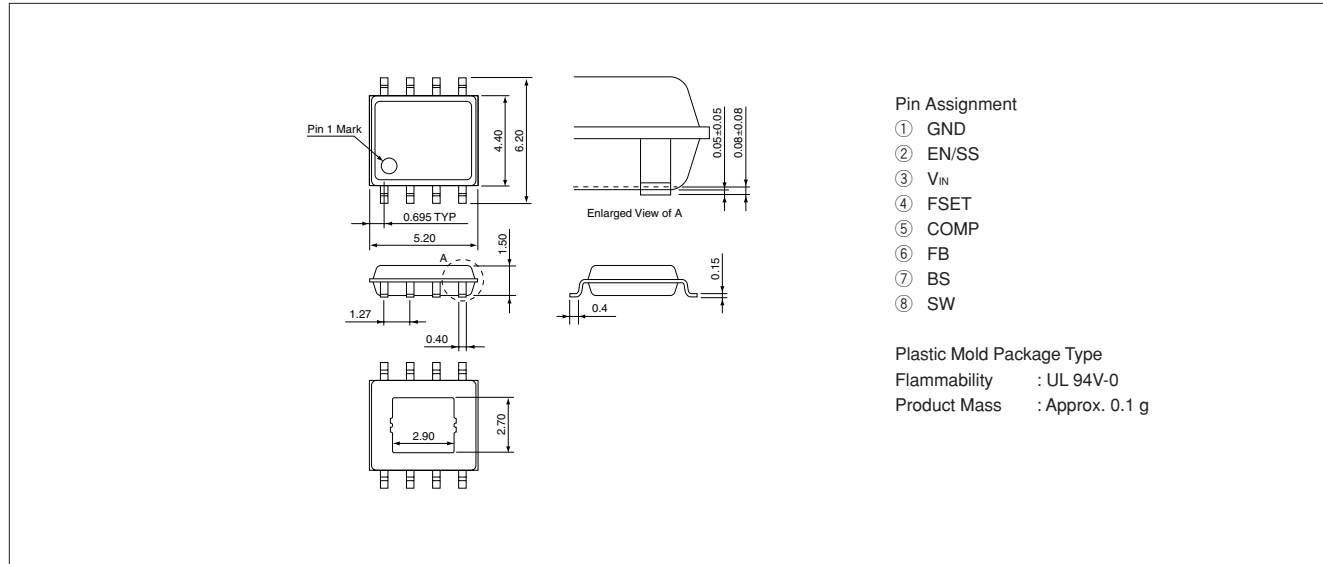
**■ Electrical Characteristics**

( $T_a = 25^\circ\text{C}$  and  $f_o = 500\text{kHz}$ , unless otherwise specified)

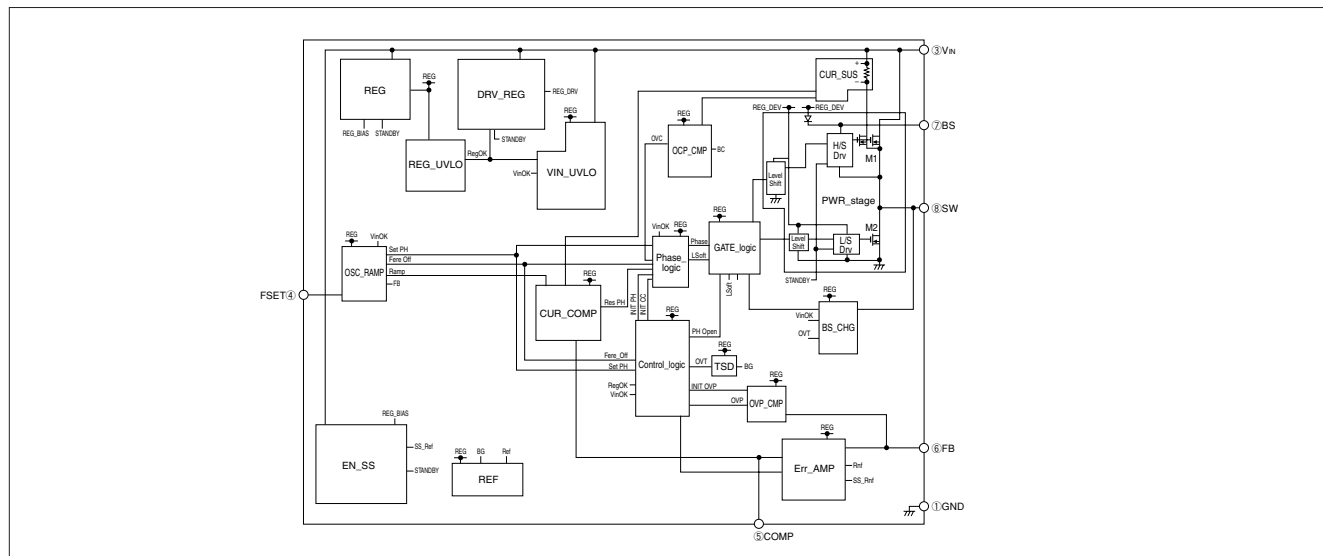
Parameter	Symbol	Ratings			Unit	Conditions	
		min.	typ.	max.			
Reference Voltage	$V_{ref}$	0.495	0.500	0.505	V	$V_{IN}=12\text{V}$ , $I_o=1.0\text{A}$	
Temperature Coefficient of Reference Voltage	$\Delta V_{REF}/\Delta T$		$\pm 0.05$		mV/°C	$V_{IN}=12\text{V}$ , $I_o=1.0\text{A}$ , $T_a=-40$ to $+85^\circ\text{C}$	
Efficiency	$\eta$		90		%	$V_{IN}=12\text{V}$ , $V_o=5\text{V}$ , $I_o=1.0\text{A}$	
Oscillation Frequency 1	$f_{o1}$		200		kHz	$V_{IN}=12\text{V}$ , $V_o=5\text{V}$ , $I_o=1\text{A}$ , $R_{fset}=375\text{k}\Omega$	
Oscillation Frequency 2	$f_{o2}$		1		MHz	$V_{IN}=12\text{V}$ , $V_o=5\text{V}$ , $I_o=1\text{A}$ , $R_{fset}=75\text{k}\Omega$	
Line Regulation	$\Delta V_{OLINE}$		50		mV	$V_{IN}=8$ to $43\text{V}$ , $V_o$ to $5\text{V}$ , $I_o=1\text{A}$	
Load Regulation	$\Delta V_{LOAD}$		50		mV	$V_{IN}=12\text{V}$ , $V_o=5\text{V}$ , $I_o=0.1$ to $3.0\text{A}$	
Overcurrent Protection Starting Current	$I_s$	3.1		6.0	A	$V_{IN}=12\text{V}$ , $V_o=5\text{V}$	
Quiescent Circuit Current	$I_{IN}$		8		mA	$V_{IN}=12\text{V}$ , $V_{comp}=0\text{V}$	
	$I_{IN(OFF)}$			40	$\mu\text{A}$	$V_{IN}=12\text{V}$ , $V_{EN/SS}=0\text{V}$	
EN/SS Pin	Outflow Current at Low Voltage	$I_{EN/SS}$	5		$\mu\text{A}$	$V_{EN/SS}=0\text{V}$ , $V_{IN}=12\text{V}$	
	Open Voltage	$V_{SSH}$	3.0	4.5	6.0	V	$V_{IN}=12\text{V}$
	On Threshold Voltage	$V_{C/EH}$	0.6	1.3	2.0	V	$V_{IN}=12\text{V}$
OVP Start Voltage	$V_{ovp}$	0.57	0.60	0.63	V		
Thermal Protection Start Temperature	$T_j$	151	160		°C		
Error Amplifier Voltage Gain	AEA		800		V/V		
Error Amplifier Transformer Conductance	GEA		800		$\mu\text{A}/\text{V}$		
Current Sense Amplifier Impedance	GCS		3.33		A/V		
Maximum ON Duty	DMAX	80	90		%	$V_{IN}=12\text{V}$	
Minimum ON Time	DMIN		150		nsec	$V_{IN}=12\text{V}$	

External Dimensions (HSOP8)

(Unit : mm)



Block Diagram



Typical Connection Diagram

