

SI-8205NHD**Surface-Mount, Current Mode Control, Synchronous Rectifier Step-down Switching Mode Regulator ICs****■ 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
- 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 (V_{IN} Pin)	V_{IN}	46	V	
Power Dissipation*1	P_D	1.35	W	When mounted on a 30 × 30 mm glass-epoxy board (with a 25 × 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>)	θ_{j-c}	40	°C/W	
Thermal Resistance (Junction to Ambient Air)	θ_{j-a}	74	°C/W	When mounted on a 30 × 30 mm glass-epoxy board (with a 25 × 25 mm copper area)

■ Recommended Operating Conditions

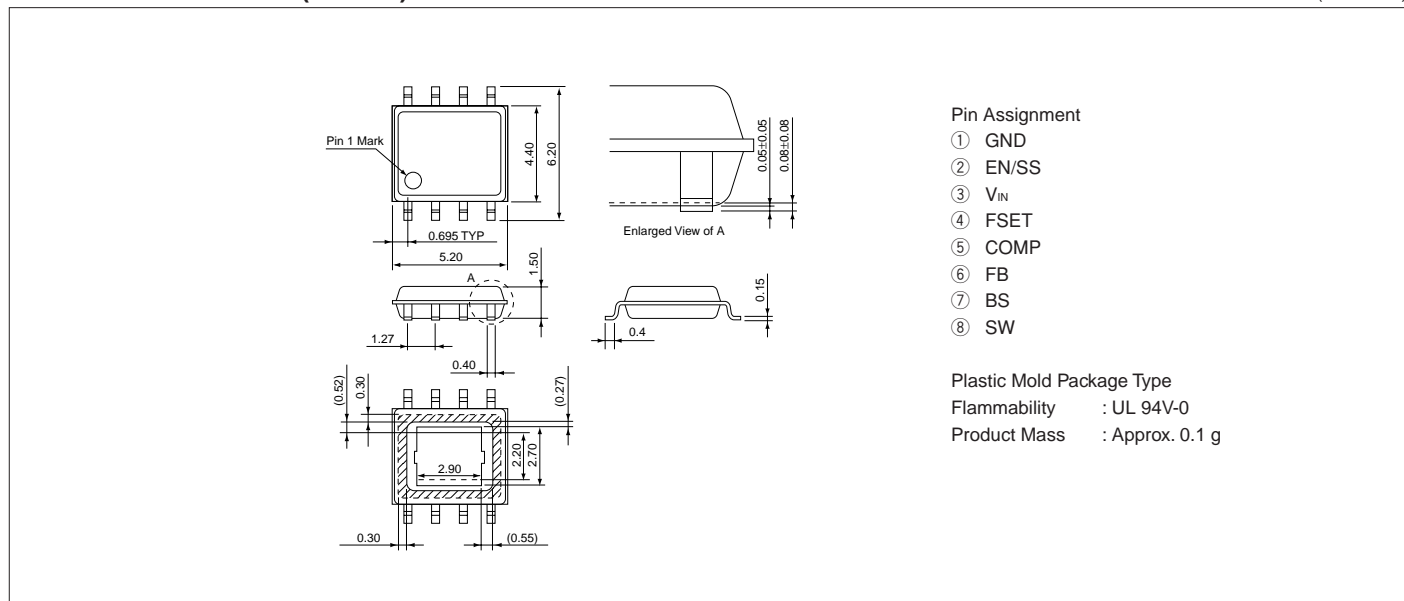
Parameter	Symbol	Ratings	Unit
Input Voltage Range	V_{IN}	$V_o + 3$ to 43	V
Output Current Range	I_o	0 to 3.0	A
Output Voltage Range	V_o	0.5 to 24	V
Operating Junction Temperature Range	T_{jop}	-40 to +125	°C
Operating Temperature Range	T_{op}	-40 to +85	°C

■ Electrical Characteristics(T_a = 25°C and f_o = 500kHz unless otherwise specified)

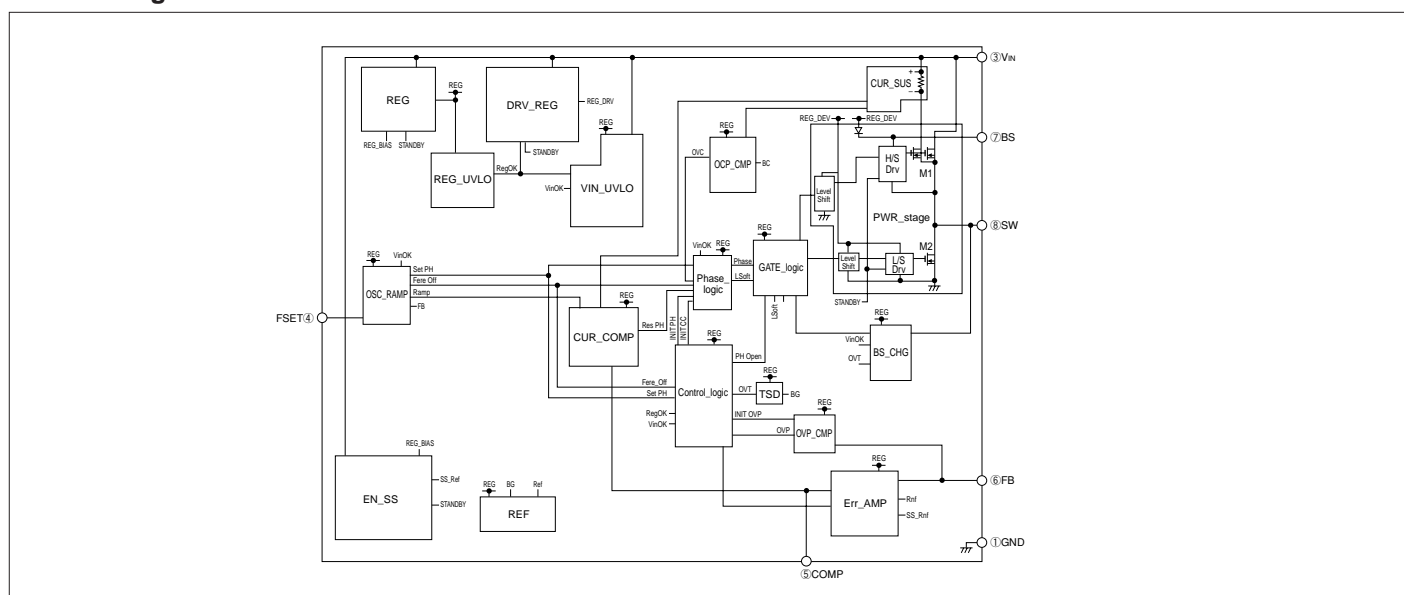
Parameter	Symbol	Ratings			Unit	Conditions
		min.	typ.	max.		
Reference Voltage	V_{ref}	0.495	0.500	0.505	V	$V_{IN}=12V, I_o=1.0A$
Temperature Coefficient of Reference Voltage	$\Delta V_{REF}/\Delta T$		± 0.05		mV/°C	$V_{IN}=12V, I_o=1.0A, T_a=-40$ to +85°C
Efficiency	η		90		%	$V_{IN}=12V, V_o=5V, I_o=1.0A$
Oscillation Frequency 1	f _{o1}		200		kHz	$V_{IN}=12V, V_o=5V, I_o=1A, R_{fset}=375k\Omega$
Oscillation Frequency 2	f _{o2}		1		MHz	$V_{IN}=12V, V_o=5V, I_o=1A, R_{fset}=75k\Omega$
Line Regulation	ΔV_{OLINE}		50		mV	$V_{IN}=8$ to 43V, V_o to 5V, $I_o=1A$
Load Regulation	ΔV_{OLOAD}		50		mV	$V_{IN}=12V, V_o=5V, I_o=0.1$ to 3.0A
Overcurrent Protection Starting Current	I_s	3.1		6.0	A	$V_{IN}=12V, V_o=5V$
Quiescent Circuit Current	I_{IN}		8		mA	$V_{IN}=12V, V_{comp}=0V$
	$I_{IN(OFF)}$			40	μA	$V_{IN}=12V, V_{EN/SS}=0V$
EN/SS Pin	Outflow Current at Low Voltage	$I_{EN/SS}$		5	μA	$V_{EN/SS}=0V, V_{IN}=12V$
	Open Voltage	V_{SSH}	3.0	4.5	V	$V_{IN}=12V$
	On Threshold Voltage	$V_{C/EH}$	0.6	1.3	2.0	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		$\mu A/V$	
Current Sense Amplifier Impedance	GCS		3.33		A/V	
Maximum ON Duty	DMAX		90		%	$V_{IN}=12V$
Minimum ON Time	DMIN		150		nsec	$V_{IN}=12V$

External Dimensions (HSOP8)

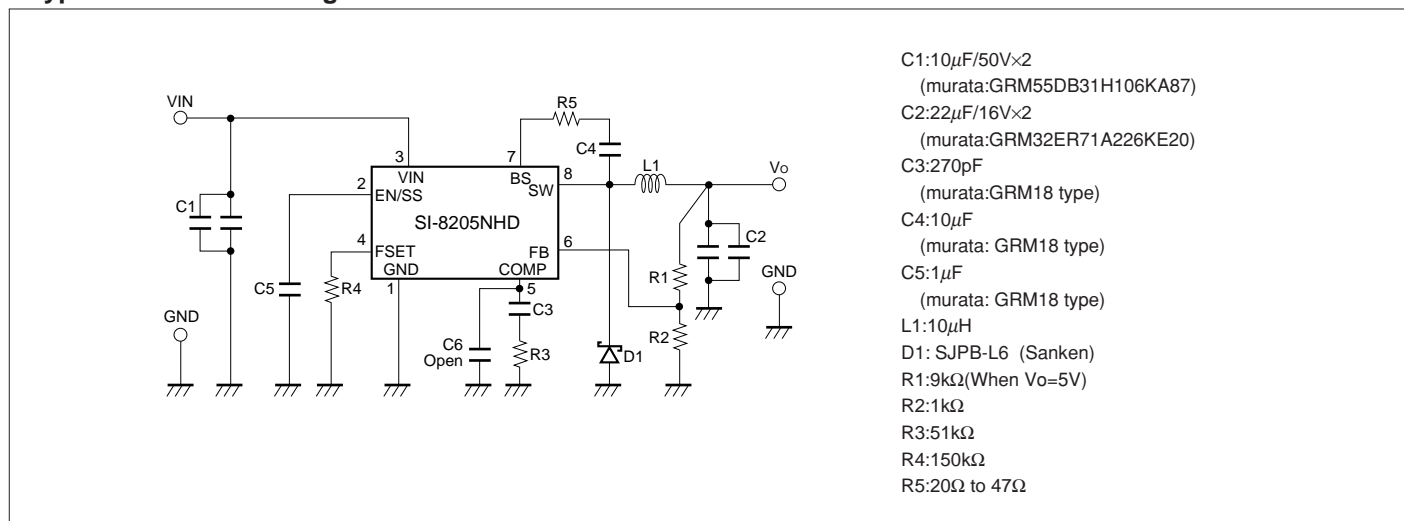
(Unit : mm)



Block Diagram



Typical Connection Diagram



- C1: 10 μ F/50V \times 2 (murata: GRM55DB31H106KA87)
- C2: 22 μ F/16V \times 2 (murata: GRM32ER71A226KE20)
- C3: 270pF (murata: GRM18 type)
- C4: 10 μ F (murata: GRM18 type)
- C5: 1 μ F (murata: GRM18 type)
- L1: 10 μ H
- D1: SJPB-L6 (Sanken)
- R1: 9k Ω (When Vo=5V)
- R2: 1k Ω
- R3: 51k Ω
- R4: 150k Ω
- R5: 20 Ω to 47 Ω