

SI-8205NHD

Surface-Mount, Current Mode Control, Synchronous Rectifier Step-down Switching Mode

Features

- Compact surface-mount (HSOP8) package
- Wide input voltage range (VIN): Vo + 3 to 43 V
- Synchronous rectifier mode
- Output current: 3 A
- Reference voltage and accuracy of 0.5 V ±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)	VIN	46	V	
Power Dissipation	PD	1.35	W	When mounted on a 30 × 30 mm glass-epoxy board (with a 25 × 25 mm copper area)
Junction Temperature	TJ	−40 to +150	°C	
Storage Temperature	Tstg	−40 to +150	°C	
Thermal Resistance (Junction to Lead <1 pin>)	θj-c	40	°C/W	
Thermal Resistance (Junction to Ambient Air)	θj-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	VIN	8 or Vo+3 to 43	V
Output Current Range	Io	0 to 3.0	A
Output Voltage Range	Vo	0.5 to 24	V
Operating Junction Temperature Range	TJop	−40 to +125	°C
Operating Temperature Range	TOp	−40 to +85	°C

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

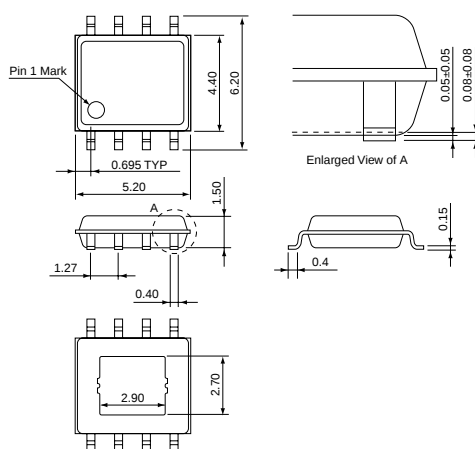
Electrical Characteristics

(Ta = 25°C and fo = 500kHz, unless otherwise specified)

Parameter		Symbol	Ratings			Unit	Conditions
			min.	typ.	max.		
Reference Voltage		Vref	0.495	0.500	0.505	V	VIN=12V, Io=1.0A
Temperature Coefficient of Reference Voltage		ΔVREF/ΔT		±0.05		mV/°C	VIN=12V, Io=1.0A, Ta=−40 to +85°C
Efficiency		η		90		%	VIN=12V, Vo=5V, Io=1.0A
Oscillation Frequency 1		fo1		200		kHz	VIN=12V, Vo=5V, Io=1A, Rfset=375kΩ
Oscillation Frequency 2		fo2		1		MHz	VIN=12V, Vo=5V, Io=1A, Rfset=75kΩ
Line Regulation		ΔVOLUME		50		mV	VIN=8 to 43V, Vo to 5V, Io=1A
Load Regulation		ΔVLOAD		50		mV	VIN=12V, Vo=5V, Io=0.1 to 3.0A
Overcurrent Protection Starting Current		Is	3.1		6.0	A	VIN=12V, Vo=5V
Quiescent Circuit Current		IIN		8		mA	VIN=12V, Vcomp=0V
		IIN(OFF)			40	μA	VIN=12V, VEN/SS=0V
EN/SS Pin	Outflow Current at Low Voltage	IEN/SS		5		μA	VEN/SS=0V, VIN=12V
	Open Voltage	VSSH	3.0	4.5	6.0	V	VIN=12V
	On Threshold Voltage	VC/EH	0.6	1.3	2.0	V	VIN=12V
OVP Start Voltage		VOvp	0.57	0.60	0.63	V	
Thermal Protection Start Temperature		TJ	151	160		°C	
Error Amplifier Voltage Gain		AEA		800		V/V	
Error Amplifier Transformer Conductance		GEA		800		μA/V	
Current Sense Amplifier Impedance		GCS		3.33		A/V	
Maximum ON Duty		DMAX	80	90		%	VIN=12V
Minimum ON Time		DMIN		150		nsec	VIN=12V

External Dimensions (HSOP8)

(Unit : mm)



Pin Assignment

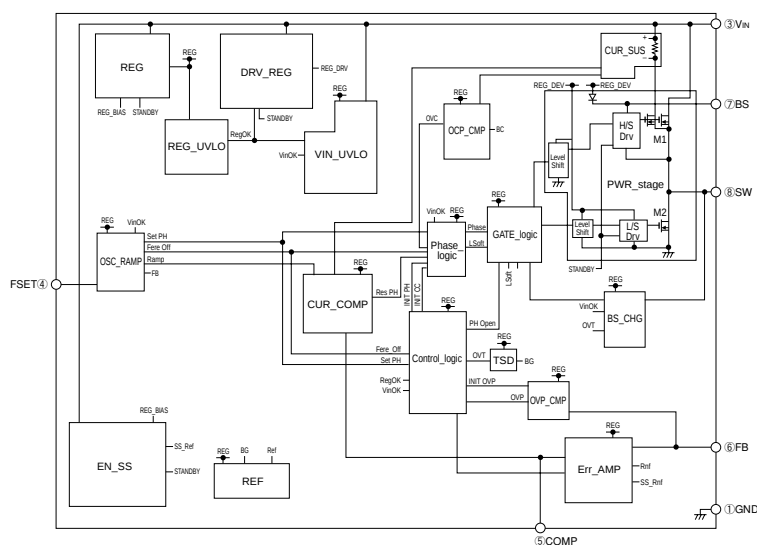
- ① GND
- ② EN/SS
- ③ VIN
- ④ FSET
- ⑤ COMP
- ⑥ FB
- ⑦ BS
- ⑧ SW

Plastic Mold Package Type

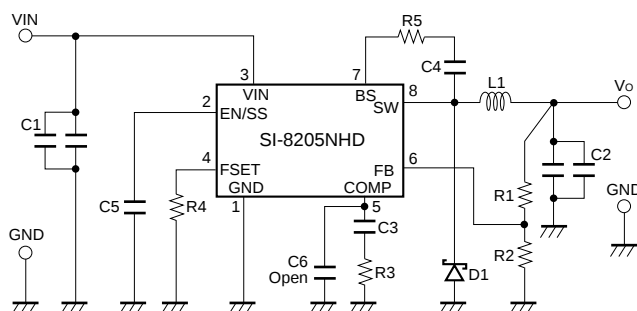
Flammability : UL 94V-0

Product Mass : Approx. 0.1 g

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⁻¹
(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 ⁻¹
- R2:1k Ω
- R3:51k Ω ⁻¹
- R4:150k Ω
- R5:47 Ω

*1: When Vo=5V