

NR887D/NR891D Full-Mold, Separate Excitation Step-down Switching Mode Regulator ICs
Current Mode Control, Synchronous Rectifier Step-down Switching Mode

Features

- DIP 8 pin package
- Input voltage range (VIN): Vo + 3 to 18 V
- Synchronous rectifier mode
- High efficiency: 90%
- Introduction of current mode control method
- A ceramic capacitor can be used for output
- Built-in phase correction component
- Output current: 2 A
- Reference voltage and accuracy of 0.8 V ± 2%
- Oscillation frequency: 500 kHz
- Output ON/OFF available
- Undervoltage lockout
- Soft start function

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Input Voltage	VIN	20	V	
Power Dissipation	PD	1.50	W	When mounted on a 70 × 60 mm glass-epoxy board (with a 1310 mm² copper area)
Junction Temperature	TJ	−40 to +150	°C	
Storage Temperature	Tstg	−40 to +150	°C	
Thermal Resistance (Junction to Lead (4 pins))	θj-c	25	°C/W	
Thermal Resistance (Junction to Ambient Air)	θj-a	67	°C/W	When mounted on a 70 × 60 mm glass-epoxy board (with a 1310 mm² copper area)

Recommended Operating Conditions

Parameter	Symbol	Ratings	Unit
Input Voltage Range	VIN	4.5 or Vo + 3* to 18	V
Output Current Range	Io	0 to 2.0	A
Output Voltage Range	Vo	0.8 to 14	V
Operating Temperature Range	Top	−40 to +85	°C

*: The minimum value of the input voltage range is 4.5 V or Vo + 3 V, whichever is higher.

Applications

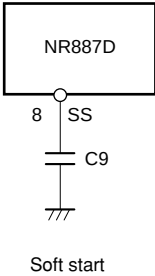
- Power supply for LCDTV and PDP
- Power supply for DVD, BD, and STB
- On-board local power supply
- Power supply for switches

Electrical Characteristics

(Ta=25°C, VIN=12V, Vo=3.3V, and Io=1.0A, unless otherwise specified)

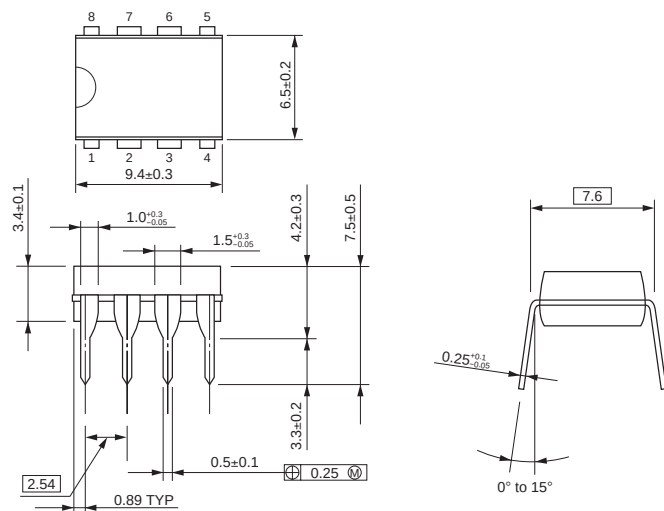
Parameter	Symbol	Ratings			Unit	Conditions
		min.	typ.	max.		
Reference Voltage	VREF	0.784	0.800	0.816	V	
Temperature Coefficient of Reference Voltage	ΔVREF/ΔT		±0.05		mV/°C	Ta=−40°C to +85°C
Efficiency	η		90		%	
Oscillation Frequency	fo	400	500	600	kHz	
Line Regulation	VLINE		50		mV	VIN=6.3V to 18V
Load Regulation	VLoad		50		mV	Io=0.1 to 2.0A
Overcurrent Protection Starting Current	Is	3.1		6.0	A	
Quiescent Circuit Current 1	IIN		6		mA	VEN=10Ω pull up to VIN
Quiescent Circuit Current 2	IIN(off)			10	μA	Io=0A, VEN=0V
SS Pin	Outflow Current at Low Voltage	6	10	14	μA	VSS=0V
	Open Voltage		3.0		V	
EN Pin	Inflow Current		50	100	μA	VEN=10V
	On Threshold Voltage	0.7	1.4	2.1	V	
Maximum ON Duty	DMAX		90		%	
Minimum ON Time	DMIN		150		nsec	
Thermal Protection Start Temperature	TSD	151	165		°C	
Thermal Protection Return Hysteresis	TSD_hys		20		°C	

*: 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 (DIP8)

(Unit : mm)

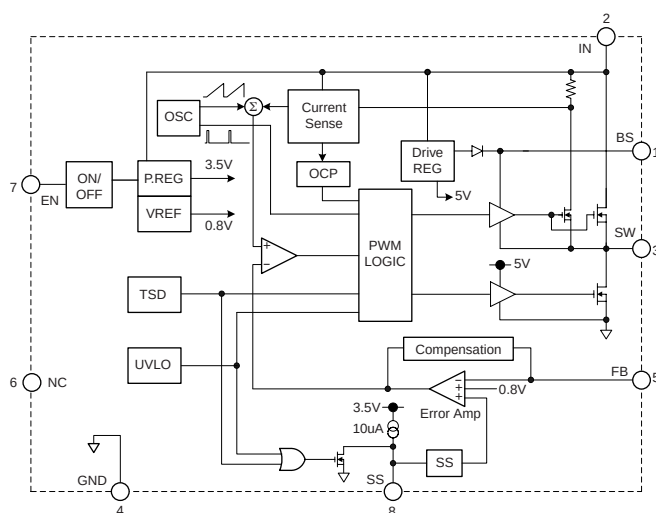


Pin Assignment

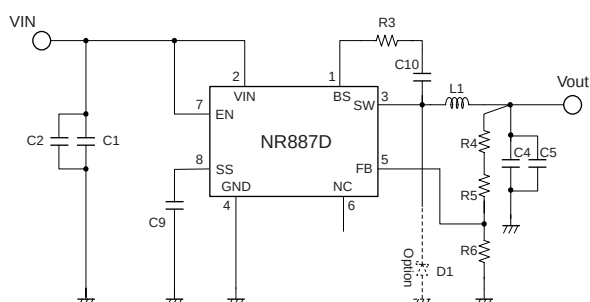
- ① BS
- ② VIN
- ③ SW
- ④ GND
- ⑤ FB
- ⑥ NC
- ⑦ EN
- ⑧ SS

Plastic Mold Package Type
 Flammability: UL 94V-0
 Product Mass: Approx. 0.49g

Block Diagram



Typical Connection Diagram



C1, C2: 10μF/25V
 C4, C5: 22μF/16V
 C9: 0.1μF
 C10: 0.1μF
 L1: 10μH
 R3: 20Ω to 47Ω
 R4+R5: 5kΩ (Vo=3.3V)
 R6: 1.6kΩ