



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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NR887D Current Mode Control, Synchronous Rectifier Step-down Switching Mode

■ Features

- DIP 8 pin package
- Input voltage range (V_{IN}): $V_O + 3$ 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 $0.8\text{ V} \pm 2\%$
- Oscillation frequency: 500 kHz
- Output ON/OFF available
- Undervoltage lockout
- Soft start function

■ 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

($T_a=25^\circ\text{C}$, $V_{IN}=12\text{V}$, $V_O=3.3\text{V}$, and $I_O=1.0\text{A}$, unless otherwise specified)

| Parameter | Symbol | Ratings | | | Unit | Conditions |
|--|--------------------------------|---------|------------|-------|------------------|--|
| | | min. | typ. | max. | | |
| Reference Voltage | V_{REF} | 0.784 | 0.800 | 0.816 | V | |
| Temperature Coefficient of Reference Voltage | $\Delta V_{REF}/\Delta T$ | | ± 0.05 | | mV/C | $T_a=-40^\circ\text{C}$ to $+85^\circ\text{C}$ |
| Efficiency | η | | 90 | | % | |
| Oscillation Frequency | f_o | 400 | 500 | 600 | kHz | |
| Line Regulation | V_{LINE} | | 50 | | mV | $V_{IN}=6.3\text{V}$ to 18V |
| Load Regulation | V_{Load} | | 50 | | mV | $I_O=0.1$ to 2.0A |
| Overcurrent Protection Starting Current | I_S | 3.1 | | 6.0 | A | |
| Quiescent Circuit Current 1 | I_{IN} | | 6 | | mA | $V_{EN}=10\Omega$ pull up to V_{IN} |
| Quiescent Circuit Current 2 | $I_{IN(off)}$ | | | 10 | μA | $I_O=0\text{A}$, $V_{EN}=0\text{V}$ |
| SS Pin | Outflow Current at Low Voltage | 6 | 10 | 14 | μA | $V_{SS}=0\text{V}$ |
| | Open Voltage | | 3.0 | | V | |
| EN Pin | Inflow Current | | 50 | 100 | μA | $V_{EN}=10\text{V}$ |
| | 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 | | $^\circ\text{C}$ | |
| Thermal Protection Return Hysteresis | TSD_hys | | 20 | | $^\circ\text{C}$ | |

*: 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.

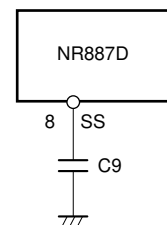
■ Absolute Maximum Ratings

| Parameter | Symbol | Ratings | Unit | Conditions |
|--|----------------|-----------------|---------------------------|---|
| Input Voltage | V_{IN} | 20 | V | |
| Power Dissipation | P_D | 1.50 | W | When mounted on a 70×60 mm glass-epoxy board (with a 1310 mm^2 copper area) |
| Junction Temperature | T_J | -40 to $+150$ | $^\circ\text{C}$ | |
| Storage Temperature | T_{stg} | -40 to $+150$ | $^\circ\text{C}$ | |
| Thermal Resistance (Junction to Lead (4 pins)) | θ_{j-c} | 25 | $^\circ\text{C}/\text{W}$ | |
| Thermal Resistance (Junction to Ambient Air) | θ_{j-a} | 67 | $^\circ\text{C}/\text{W}$ | When mounted on a 70×60 mm glass-epoxy board (with a 1310 mm^2 copper area) |

■ Recommended Operating Conditions

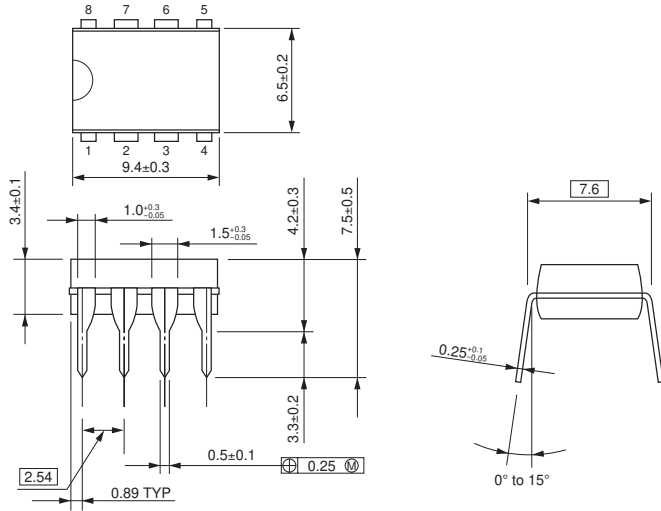
| Parameter | Symbol | Ratings | Unit |
|-----------------------------|----------|------------------------------|------------------|
| Input Voltage Range | V_{IN} | 4.5 or $V_O + 3^*$ to 18 | V |
| Output Current Range | I_O | 0 to 2.0 | A |
| Output Voltage Range | V_O | 0.8 to 14 | V |
| Operating Temperature Range | T_{op} | -40 to $+85$ | $^\circ\text{C}$ |

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



External Dimensions (DIP8)

(Unit : mm)

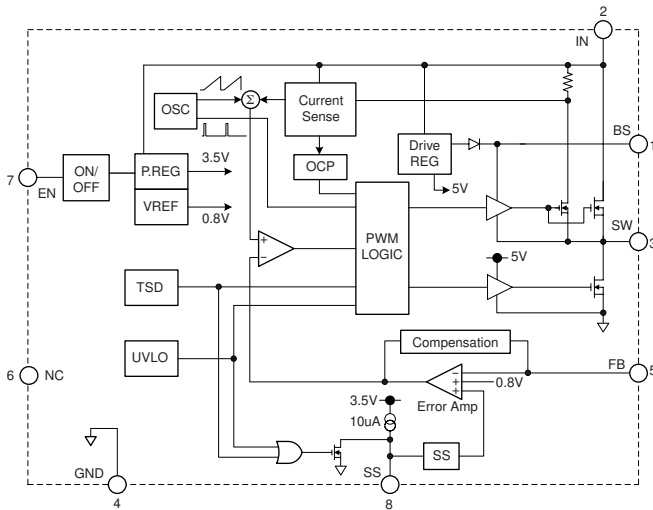


Pin Assignment

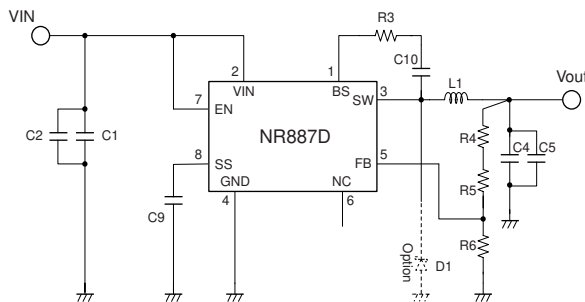
- ① BS
- ② VIN
- ③ SW
- ④ GND
- ⑤ FB
- ⑥ NC
- ⑦ EN
- ⑧ SS

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