

FEATURES

- PRC (Pulse Ratio Control) mode operation (minimum $t_{blanking}=11\mu s$);
- Current mode operation (DCM & CCM);
- Cycle-by-cycle current limiting;
- Low start-up current ($60\mu A$);
- Low operation current ($7mA$);
- Under voltage lockout (UVLO) with Hysteresis($14.2V/7.9V$);
- Gate output voltage clamped at $17.5V$;
- High current push-pull output;
- Few external components required.

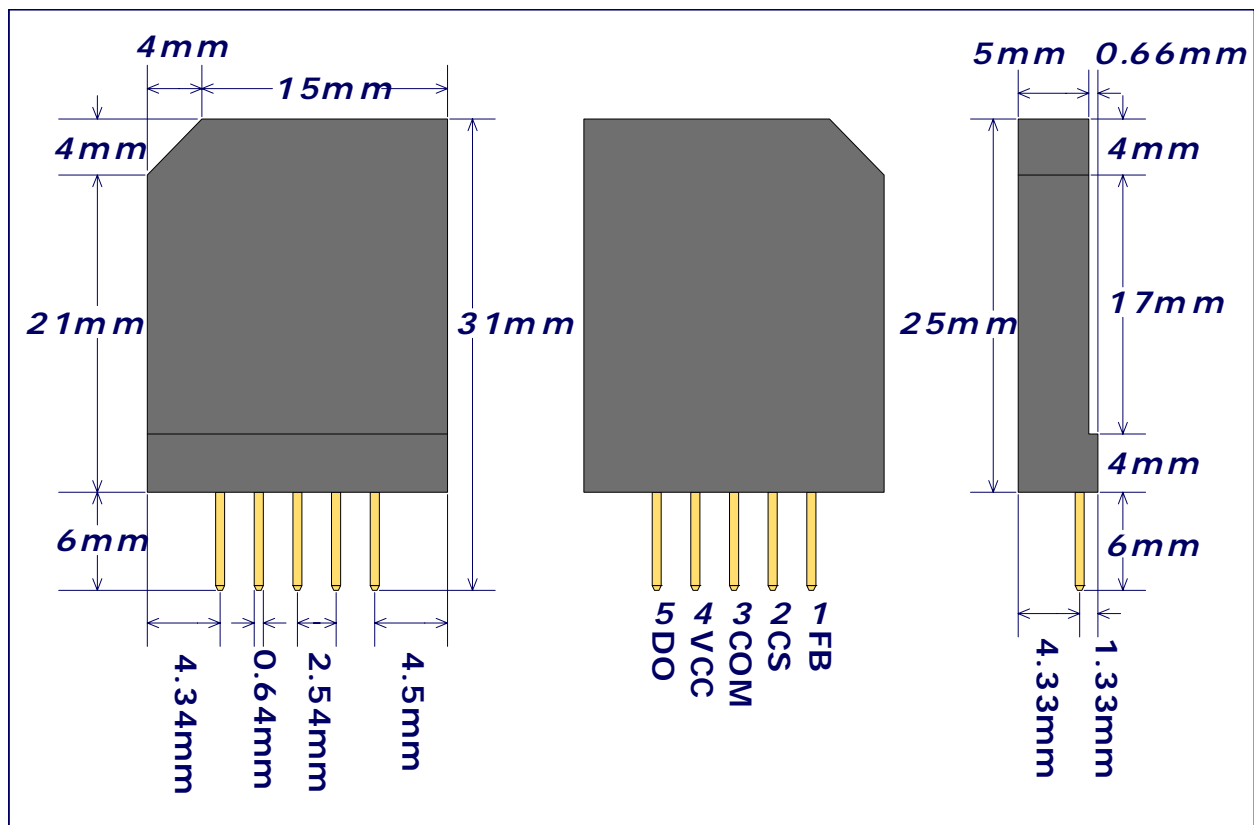


Figure 1 : Package information and pin configuration

PIN DESCRIPTION

| Symbol | Function | Description | No |
|--------|-------------------------|--|----|
| FB | Sets the peak current | Non-inverting input of current comparator | 1 |
| CS | Current sense input | Inverting input of current comparator | 2 |
| COM | Reference ground | The cathodal supply of the controller | 3 |
| VCC | Supplies the controller | The positive supply of the controller | 4 |
| DO | Driving pulses output | This output directly drives the gate of power MOSFET | 5 |

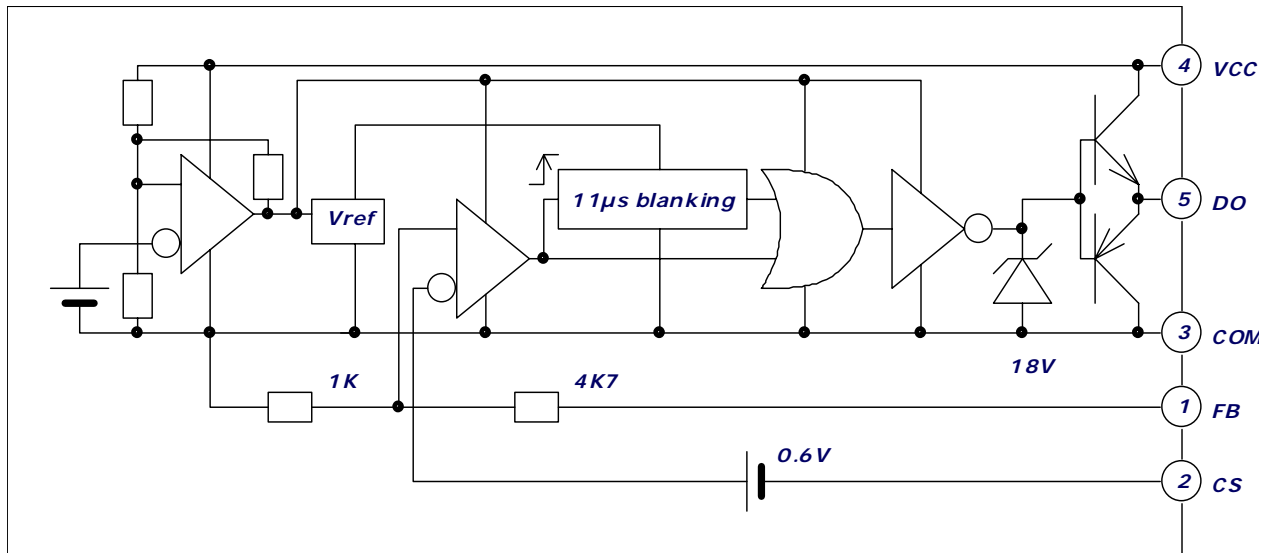


Figure 2 : Block diagram

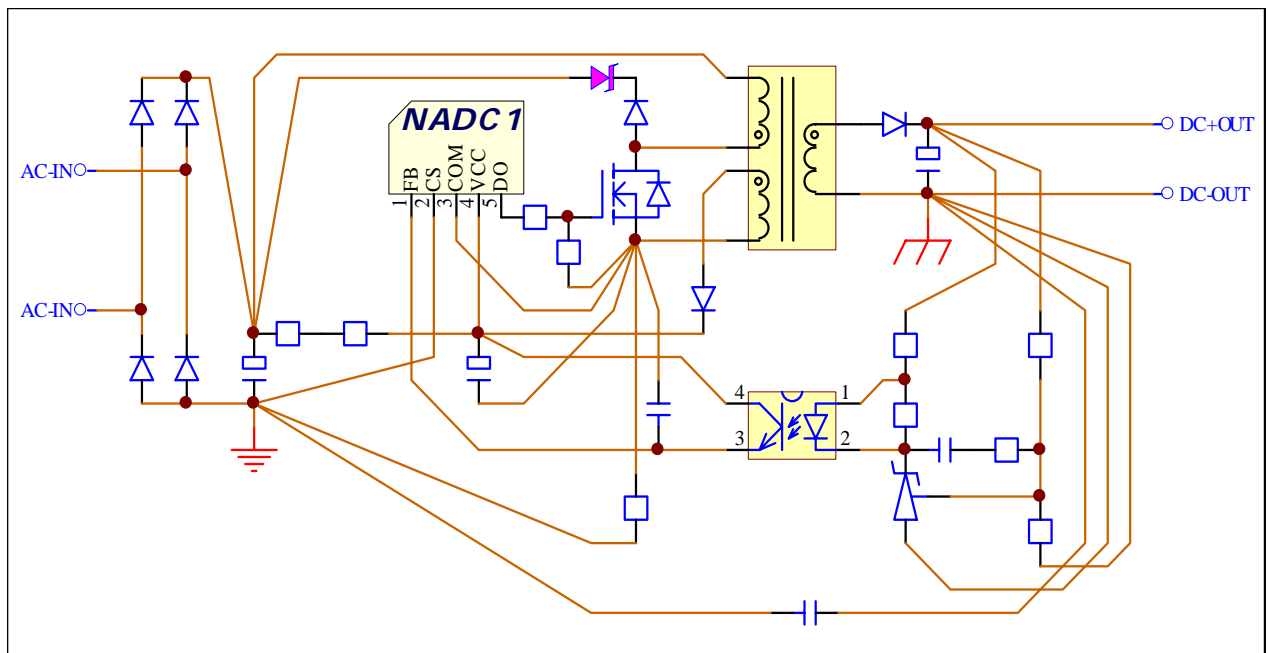


Figure 3 : Typical application

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|----------|---------------------------------------|------------------|------|
| V_i | Supply voltage (low impedance source) | 25 | V |
| I_o | Output sink current (peak) | 1 | A |
| | Output source current (peak) | 0.5 | A |
| V_{in} | Pin1 inputs | -0.3 to V_{CC} | V |
| | Pin2 inputs | -0.9 to +5 | V |

ABSOLUTE MAXIMUM RATINGS (continued)

| Symbol | Parameter | Value | Unit |
|-----------|-------------------------------|-------------|------|
| T_{stg} | Storage temperature range | -55 to +150 | °C |
| T_J | Ambient operating temperature | -25 to +85 | °C |

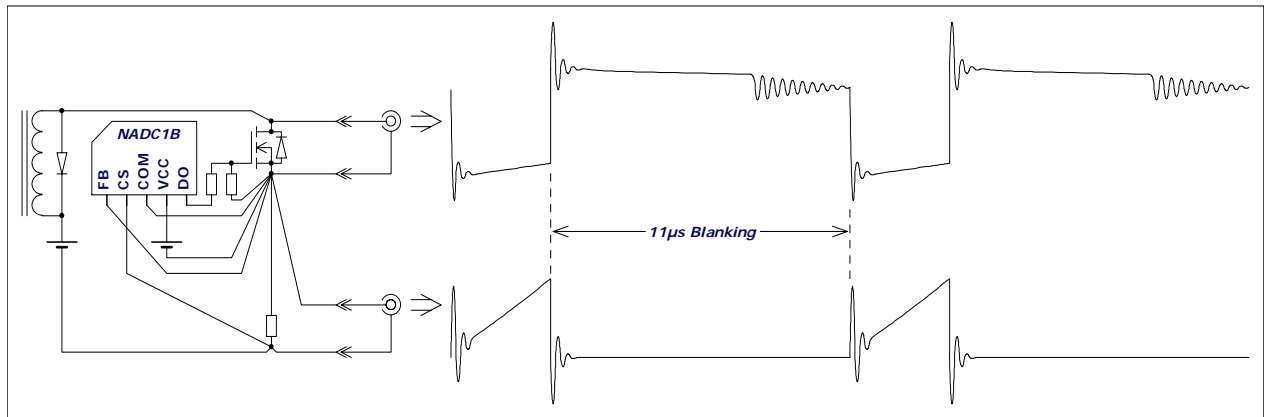


Figure 4 : Test circuit and waveform (DCM)

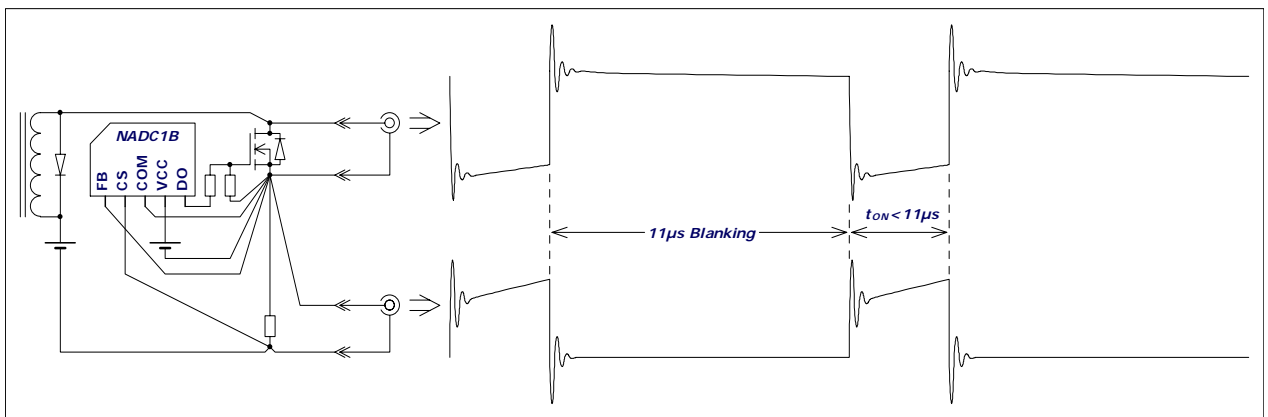


Figure 5 : Test circuit and waveform (CCM & D < 50%)

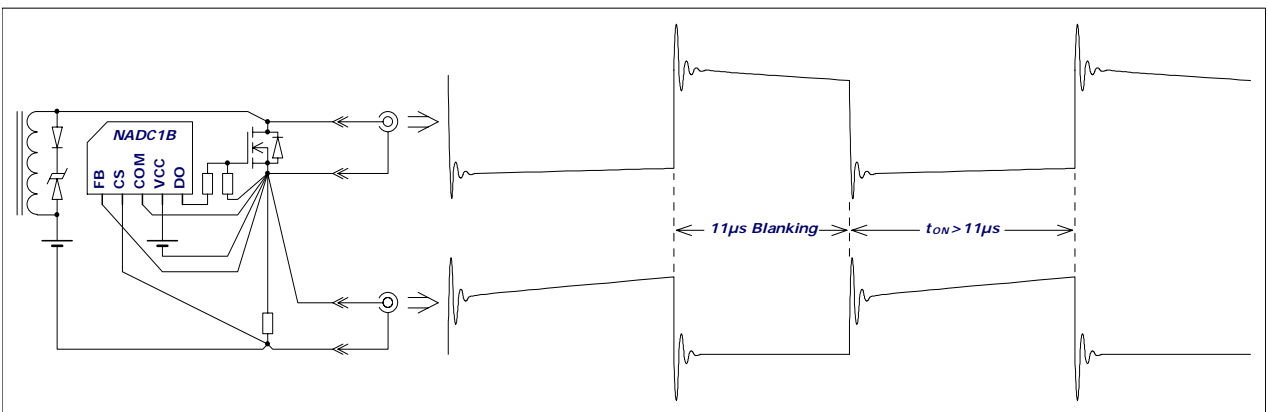


Figure 6 : Test circuit and waveform (CCM & D > 50%)

Off-line S.M.P.S. current mode controller

NADC1B

ELECTRICAL CHARACTERISTICS [$T_A=25^{\circ}\text{C}$; $V_{CC}=15\text{V}$ ($V_{Pin4}-V_{Pin3}=15\text{V}$); currents are positive when flowing into the IC;unless otherwise specified.]

| Symbol | Parameter | Test Conditions | Pin | Minimum | Typical | Maximum | Unit |
|---|--|--|-----|----------------|----------|---------|---------------|
| Control Section | | | | | | | |
| t_{blanking} | Minimum t_{OFF} (Internal Blanking Time) Output | $V_{Pin1}=V_{Pin3}$ | 5 | - | 11 | - | μs |
| t_{ON} | Maximum t_{ON} Output | $V_{Pin1}=V_{Pin2}=V_{Pin3}$ | 5 | - | ∞ | - | μs |
| $D_{\text{max.}}$ | Maximum Duty Cycle | $V_{Pin1}=V_{Pin2}=V_{Pin3}$ | 5 | - | 100 | - | % |
| $D_{\text{min.}}$ | Minimum Duty Cycle | $V_{Pin1}-V_{Pin3}\geq 3.9\text{V}$ | 5 | - | 0 | - | % |
| Output Section | | | | | | | |
| I_{source} | Source Current | $V_{Pin5}-V_{Pin3}=13\text{V}$ | 5 | -23 | - | - | mA |
| | | $V_{Pin5}-V_{Pin3}=7\text{V}$ | 5 | -179 | - | -521 | mA |
| | | UVLO | 5 | 0 | - | - | mA |
| I_{sink} | Sink Current | $V_{Pin5}-V_{Pin3}=7\text{V}$ | 5 | 1500 | - | - | mA |
| | | $V_{Pin5}-V_{Pin3}=1.7\text{V}$ | 5 | 800 | - | - | mA |
| | | UVLO | 5 | 0 | - | - | mA |
| V_{OH} | Output High Level | $I_{\text{source}}=-10\text{mA}$ | 5 | 13.5 | - | 13.9 | V |
| | | $I_{\text{source}}=-100\text{mA}$ | 5 | 10 | - | 12.6 | V |
| | | UVLO | 5 | High Impedance | | - | - |
| V_{OL} | Output Low Level | $I_{\text{sink}}=100\text{mA}$ | 5 | 0.6 | - | - | V |
| | | $I_{\text{sink}}=800\text{mA}$ | 5 | - | - | 1.7 | V |
| | | UVLO | 5 | High Impedance | | - | - |
| V_{CLAMP} | Output Clamp Voltage | No load on Pin5, $V_{Pin4}-V_{Pin3}=25\text{V}$ | 5 | 16 | 17.5 | 19 | V |
| Under-Voltage Lockout Output Section | | | | | | | |
| V_{start} | Start Threshold | | 4 | 13.4 | 14.2 | 15 | V |
| V_{UVLO} | Lock-Out UnderVoltage | | 4 | 7.5 | 7.9 | 8.3 | V |
| V_{hys} | Hysteresis Voltage | $V_{\text{start}}-V_{\text{UVLO}}$ | 4 | 5.1 | 6.3 | 7.5 | V |
| Total Standby Current | | | | | | | |
| I_{st} | Start-up Current | $V_{Pin4}-V_{Pin3}=7\text{V}$ | 4 | 50 | 55 | 60 | μA |
| I_{i} | Operating Supply Current | No load on Pin5, $V_{Pin1}=V_{Pin2}=V_{Pin3}$ | 4 | 5.6 | 6.3 | 7 | mA |
| Current Sense Section | | | | | | | |
| V_{TH} | Current Limit Threshold Voltage | $V_{Pin1}=V_{Pin3}$ | 2 | 0.5 | 0.6 | 0.7 | V |
| I_{b} | Input Bias Current | | 2 | - | -650 | - | μA |
| Feedback Input Section | | | | | | | |
| Z_{FB} | Input Impedance | | 1 | 4.7 | 5.7 | 6 | k Ω |
| I_{OZ} | Zero Duty Cycle Input Current | $V_{Pin2}=V_{Pin3}$ | 1 | - | 650 | - | μA |