

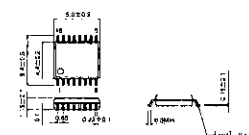
# 1-channel Step-down PWM switching regulator controller with synchronous rectification **BD9721FV**

## ●Description

The BD9721FV is a 1-chip synchronous rectification step down PWM switching regulator controller IC for a DC/DC converter. The synchronous rectification system achieves higher efficiency. It incorporates a timer latch short protection circuit and a stand-by switch, while supporting low consumption current during OFF output.

## ●Dimension (Units : mm)

### ●SSOP-B16



## ●Features

- 1) High efficiency: more than 95%,  $I_o=1A$
- 2) External output voltage control: High precisely feedback voltage : 2%
- 3) 3A class NchFET direct drive
- 4) Built-in timer latch protection circuit  
External capacitor needed
- 5) Stand-by switch  
Stand-by current: less than  $5\mu A$

SSOP-B16

## ●Applications

HDD, PC,  
Applications required 1.5~3.3V output from 5V power supply

## ●Absolute Maximum Ratings ( $T_a=25^{\circ}C$ )

| Parameter                           | Symbol     | Limits     | Unit        |
|-------------------------------------|------------|------------|-------------|
| Supply voltage1 ( $V_{cc}-GND$ )    | $V_{cc}$   | 15         | V           |
| Supply voltage2 ( $PV_{cc1}-SW$ )   | $PV_{cc1}$ | 7.5        | V           |
| Supply voltage3 ( $PV_{cc2}-PGND$ ) | $PV_{cc2}$ | 7.5        | V           |
| Power dissipation                   | $P_d$      | 450 *1     | mW          |
| Operating temperature range         | $T_{opr}$  | 0 ~ 70     | $^{\circ}C$ |
| Storage temperature range           | $T_{stg}$  | -55 ~ +125 | $^{\circ}C$ |
| Output current                      | $I_o$      | 300 *2     | mA          |

\*1 Derating: 4.5mW/ $^{\circ}C$  for operation above  $T_a=25^{\circ}C$ .

\*2 Do not exceed PD and ASO.

● Recommended Operating Conditions (Ta=25°C)

| Parameter                     | Symbol | Min. | Typ. | Max. | Unit |
|-------------------------------|--------|------|------|------|------|
| Supply voltage1 (Vcc—GND)     | Vcc    | 3.8  | —    | 13.0 | V    |
| Supply voltage2 (PVcc1—SW)    | PVcc1  | 3.8  | —    | 6.5  | V    |
| Supply voltage3 (PVcc2—PGND)  | PVcc2  | 3.8  | —    | 6.5  | V    |
| Output current                | Io     | —    | —    | 200  | mA   |
| Timing capacitance            | CcT    | 75   | —    | 470  | pF   |
| Oscillator frequency          | Fosc   | 100  | —    | 500  | kHz  |
| Stand-by voltage              | Vstb   | GND  | —    | Vcc  | V    |
| Error amplifier input voltage | VINV   | GND  | —    | 1.6  | V    |

Note: In case of boostup of PVcc1, the voltage is approximately twice as much as PVcc2.

● Electrical Characteristics (Unless otherwise noted, Ta=25°C, Vcc= 5V, PVcc=5V, f=300kHz)

| Parameter                            | Symbol | Min.  | Typ. | Max.  | Unit | Conditions                      |
|--------------------------------------|--------|-------|------|-------|------|---------------------------------|
| Reference voltage                    | VREF   | 2.4   | 2.5  | 2.6   | V    | IREF=1mA                        |
| Oscillator frequency                 | FOSC   | 240   | 300  | 360   | kHz  | CCT=150pF                       |
| Maximum duty                         | DMAX   | 80    | 83   | 86    | %    |                                 |
| Feedback voltage                     | VF     | 1.225 | 1.25 | 1.275 | V    | INV=FB                          |
| Output rise/fall time                | Tr/Tf  | —     | 80   | —     | nS   | Cgate=2000pF, PVcc×0.1⇔PVcc×0.9 |
| Synchronous output non-over lap time | Tmo    | 50    | 150  | —     | nS   | Cgate=2000pF, G1&G2≤0.5V        |
| Active voltage                       | VTHA   | 2.4   | —    | —     | V    |                                 |
| Stand-by voltage                     | VTHS   | —     | —    | 0.8   | V    |                                 |
| Stand-by current                     | Iccs   | —     | —    | 5     | μA   |                                 |

● Block Diagram

