

## 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<sub>O</sub>=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 μA

SSOP-B16

### ●Applications

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

### ●Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage1 (V <sub>CC</sub> -GND)	V <sub>CC</sub>	15	V
Supply voltage2 (PV <sub>CC1</sub> -SW)	PV <sub>CC1</sub>	7.5	V
Supply voltage3 (PV <sub>CC2</sub> -PGND)	PV <sub>CC2</sub>	7.5	V
Power dissipation	P <sub>D</sub>	450 *1	mW
Operating temperature range	T <sub>OPR</sub>	0 ~ 70	°C
Storage temperature range	T <sub>STG</sub>	-55 ~ +125	°C
Output current	I <sub>O</sub>	300 *2	mA

\*1 Derating: 4.5mW/°C for operation above Ta=25°C.

\*2 Do not exceed PD and ASO.

● Recommended Operating Conditions ( $T_a=25^\circ\text{C}$ )

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	I <sub>O</sub>	—	—	200	mA
Timing capacitance	C <sub>CT</sub>	75	—	470	pF
Oscillator frequency	F <sub>Osc</sub>	100	—	500	kHz
Stand-by voltage	V <sub>SB</sub>	GND	—	Vcc	V
Error amplifier input voltage	V <sub>INV</sub>	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,  $T_a=25^\circ\text{C}$ , Vcc=5V, PVcc=5V, f=300kHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Reference voltage	V <sub>REF</sub>	2.4	2.5	2.6	V	I <sub>REF</sub> =1mA
Oscillator frequency	F <sub>Osc</sub>	240	300	360	kHz	C <sub>CT</sub> =150pF
Maximum duty	D <sub>MAX</sub>	80	83	86	%	
Feedback voltage	V <sub>F</sub>	1.225	1.25	1.275	V	INV=FB
Output rise/fall time	T <sub>r/T<sub>f</sub></sub>	—	80	—	nS	C <sub>gate</sub> =2000pF, PVcc $\times$ 0.1 $\leftrightarrow$ PVcc $\times$ 0.9
Synchronous output non-over lap time	T <sub>mo</sub>	50	150	—	nS	C <sub>gate</sub> =2000pF, G <sub>1</sub> &G <sub>2</sub> $\leq$ 0.5V
Active voltage	V <sub>THA</sub>	2.4	—	—	V	
Stand-by voltage	V <sub>THS</sub>	—	—	0.8	V	
Stand-by current	I <sub>CCS</sub>	—	—	5	$\mu\text{A}$	

● Block Diagram

