Data Sheet

BIT3267

High Performance PWM Controller

Version: A3

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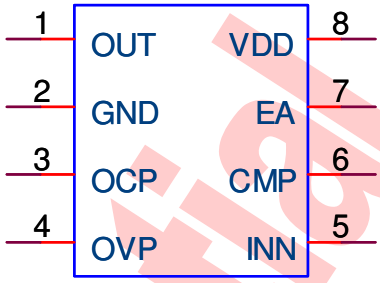
Features:

- **Current mode PWM controller**
- **8V ~ 28V operation voltage**
- **Over current protection, OCP**
- **Over voltage protection, OVP**
- **Load short protection, LSP**
- **Frequency selection**
- **Internal soft-start**
- **Over temperature protection, OTP**
- **Internal under voltage lock out, UVLO**
- **Totem pole output**
- **SOP-8 package**

Pin layout:



General description:

The BIT3267 is a high frequency PWM controller integrates required functions for boost conversion in a small SOP-8 package. A low 0.21V feedback voltage, over voltage protection and over current protection and load short protection make BIT3267 to be an ideal controller for LED backlight supplies. Frequency selection is flexible in variable system design. Internal soft start function can avoid inrush current happened in the start up period. Over temperature protection and UVLO make system reliable. CMOS process greatly reduces the operating current when comparing to similar products

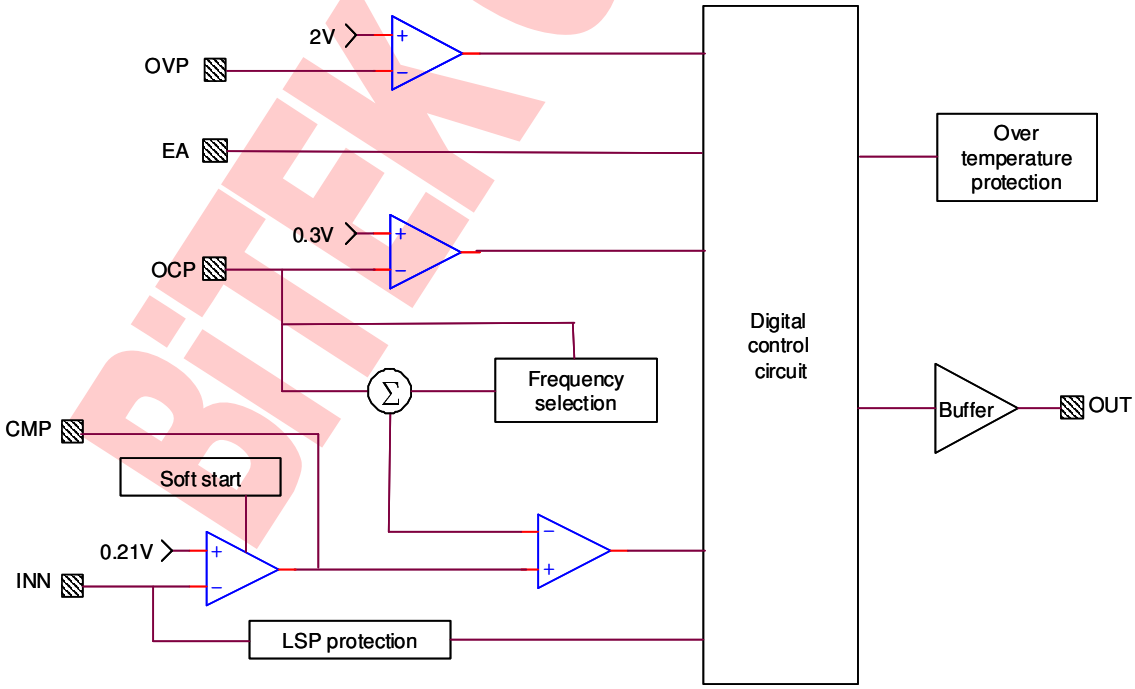
Recommended operating condition:

Supply voltage……8V ~ 28V
Operating frequency…… 220kHz/110kHz/55kHz
Operating ambient temperature……-20 ℃ ~ 85 ℃

Absolute ratings

VDD……-0.3 ~ +28 V
GND……±0.3 V
Input voltage……-0.3 ~ VDD+0.3 V
Operating ambient temperature……-20 ~ 85 ℃
Operating junction temperature……+150 ℃
Storage temperature……-55~ 150 ℃

Functional block diagram:



DC/AC characteristics: ***VDD=15V, T_A=25℃ unless otherwise specified.***

Parameter	Test conditions	Min.	Typ.	Max.	Unit
Supply voltages					
Pin VDD input		8		28	V
Under voltage look out					
Positive Going Threshold		6	7	8	V
Hysteresis	Note 1.	0.5	1	1.5	V
Chip consumed current	No load	0.7	1	4	mA
Enable control					
ON		2		VDD	V
OFF		0		0.8	V
Error amplifier reference voltage					
Non-Inverting input of the error amplifier		0.203	0.21	0.217	V
Operating frequency					
Operating frequency range	OSC connected 1kΩ	49.5	55	60.5	KHz
	OSC connected 10kΩ	99	110	121	KHz
	OSC connected 22kΩ	198	220	242	KHz
Error amplifier					
Open loop gain	Note1	50	70	90	dB
Over current protection, OCP and over voltage protection, OVP					
OCP voltage		0.25	0.3	0.35	V
OVP voltage		1.89	2.1	2.31	V
Load short protection, LSP					
LSP voltage		0.8	1	1.2	V
Over temperature protection, OTP					
Over temperature protection, OTP	Note 1.	120	180	200	℃
hysteresis	Note 1.	30	50	70	℃
Soft start and minimum output off time					
Soft start time	Note 1.	12	15.3	19	ms
Minimum off time		300	450	600	ns
Output drive					
Rising time	VDD=12V, 1000pF load	0	30	60	nS
Falling time		0	25	50	nS

Note 1. Only guaranteed by simulation or sampled evaluation during –20~+85°C. Not 100% tested.

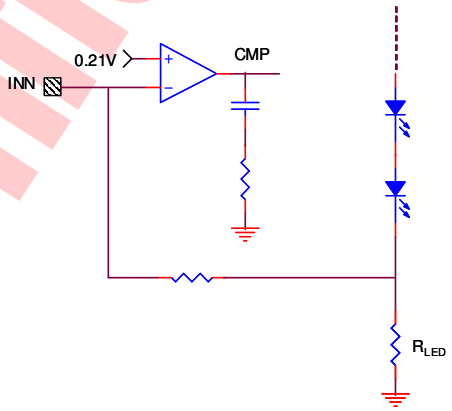
Pin description:

Pin No.	Symbol	Descriptions
1	OUT	Output pin
2	GND	Ground pin
3	OCP	Over current protection and frequency selection
4	OVP	Over voltage protection
5	INN	The inverting input of the error amplifier
6	CMP	Output of the error amplifier
7	EA	Enable pin
8	VDD	Power supply

Functional description:

Under voltage locked out, UVLO:

The Under-voltage lockout turns-off BIT3267 if the input voltage drops below the under-voltage lockout threshold. It turns-on BIT3267 if the input voltage is higher than its threshold. The hysteresis voltage is about 1V.



Enable control

The EA pin controls the state of BIT3267. When EA≧2V, BIT3267 is enabled. And EA≦0.8V, BIT3267 is disabled.

LED current regulation

Please refer following figure, a resistor R_S is connected serial with LED string that can sense LED current. This sensed LED current signal feeds to INN pin and compares with its internal reference voltage of the error amplifier. The error amplifier outputs an error signal to control LED current.

The LED current is controlled as following equation:

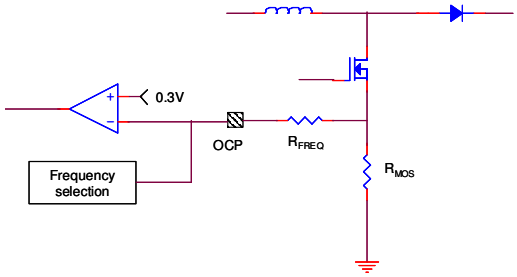
$$I_{LED} = \frac{0.21}{R_{LED}}$$

Frequency selection and over current protection

BIT3267 sets its operation frequency and over current protection in its OCP pin. In the initial state, the resistor connected in the OCP pin can select different output frequency. The selection table is as following:

F_{REQ} resistor	Frequency
1kΩ	55kHz
10kΩ	110kHz
22kΩ	220kHz

When BIT3267 enters normal operation mode OCP and detects the external MOSFET current.



The current limit is real time and estimated as following:

$$I_{MOS} = \frac{0.3}{R_{MOS}}$$

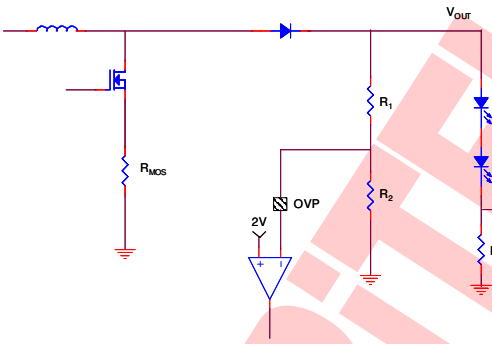
When OCP pin senses an over current signal, BIT3267 shut off its output. The shut off status can be reset by reducing the signal input to OCP.

Internal soft-start

When VDD is ready and EA receives a high signal, BIT3267 soft-start function is worked. The internal soft-start time is about 18.55ms.

Over voltage protection, OVP:

The output voltage is detected in OVP pin. When there is a voltage higher than 2V happened in this pin, BIT3267 will latch-off its output.



The OVP voltage is as following:

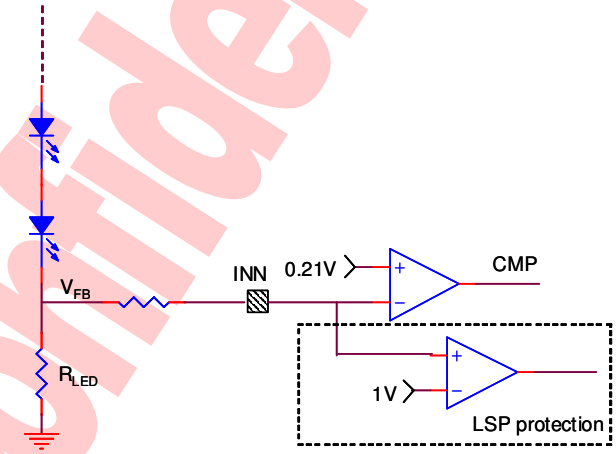
$$OVP = \frac{R_2}{R_1 + R_2} \cdot V_{OUT}$$

Over temperature protection, OTP

BIT3267 provides over temperature protection that is more reliable for system protection. When the operation temperature is too high, BIT3267 will shut off the output. When the temperature of the die drops below the threshold, BIT3267 will automatically recover to work again.

Load short protection, LSP:

The voltage of INN pin is monitored whenever it is over 1V then BIT3267 will latch-off its output. When LED is short, V_{FB} detects a higher than 1V voltage in the LSP protection comparator, BIT3267 latch-off its output.



Soldering information

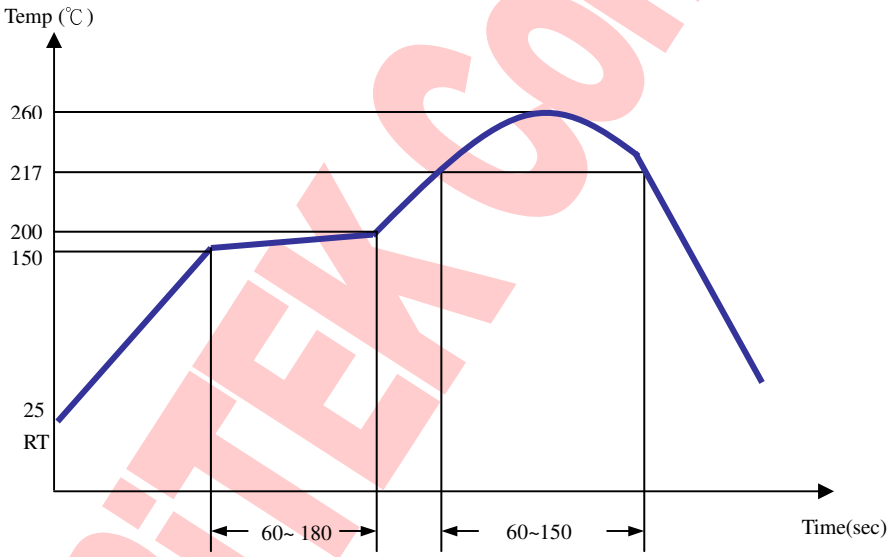
Reflow soldering:

The choice of heating method may be influenced by plastic package. If infrared or vapor phase heating is used and the package is not absolutely dry (less than 0.1% moisture content by weight), vaporization of the small amount of moisture in them can cause cracking of the plastic body. Preheating is necessary to dry the paste and evaporate the binding agent. Preheating duration: 45 minutes at 45 ℃.

Reflow soldering requires solder paste (a suspension of fine solder particles, flux and binding agent) to be applied to the printed-circuit board by screen printing, stenciling or pressure-syringe dispensing before package placement. Several methods exist for reflowing; for example, convection or convection/infrared heating in a conveyor type oven. Throughput times (preheating, soldering and cooling) vary between 100 and 200 seconds depending on heating method.

Typical reflow peak temperatures range from 215 to 270 ℃ depending on solder paste material. The top-surface temperature of the packages should preferable be kept below 245 ℃ for thick/large packages (packages with a thickness ≧ 2.5 mm or with a volume ≧ 350 mm^3 so called thick/large packages). The top-surface temperature of the packages should preferable be kept below 260 ℃ for thin/small packages (packages with a thickness < 2.5 mm and a volume < 350 mm^3 so called thin/small packages).

Stage	Condition	Duration
1'st Ram Up Rate	max3.0+/-2℃/sec	-
Preheat	150℃~200℃	60~180 sec
2'nd Ram Up	max3.0+/-2℃/sec	-
Solder Joint	217℃ above	60~150 sec
Peak Temp	260 +0/-5℃	20~40 sec
Ram Down rate	6℃/sec max	-



Wave soldering:

Conventional single wave soldering is not recommended for surface mount devices (SMDs) or printed-circuit boards with a high component density, as solder bridging and non-wetting can present major problems.

Manual soldering:

Fix the component by first soldering two diagonally-opposite end leads. Use a low voltage (24 V or less) soldering iron applied to the flat part of the lead. Contact time must be limited to 10 seconds at up to 300 ℃. When using a dedicated tool, all other leads can be soldered in one operation within 2 to 5 seconds between 270 and 320 ℃.

Order information:

BIT3267-SO

SO: SOP

Part number

Beyond Innovation Technology Co., Ltd.

Package information :

Unit: mm

SOP8 type :