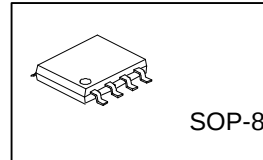


HIGH FREQUENCY PWM CONTROLLER

DESCRIPTION

The UTC1869 is a high frequency PWM controller integrates required functions for boost conversion in a small SOP-8 package . A low 0.21V feedback voltage make the UTC1869 be an ideal controller for LED backlight supplies .



FEATURES

- * Voltage Mode PWM Controller
- * Low 0.21V reference Voltage
- * 180KHz Operation
- * Deadtime Control
- * Internal UVLO(Under Voltage Lock Out)
- * Limited Output Duty Cycle
- * Low Shutdown current
- * SOP-8 Package
- * Soft Setup

ABSOLUTE MAXIMUM RATINGS

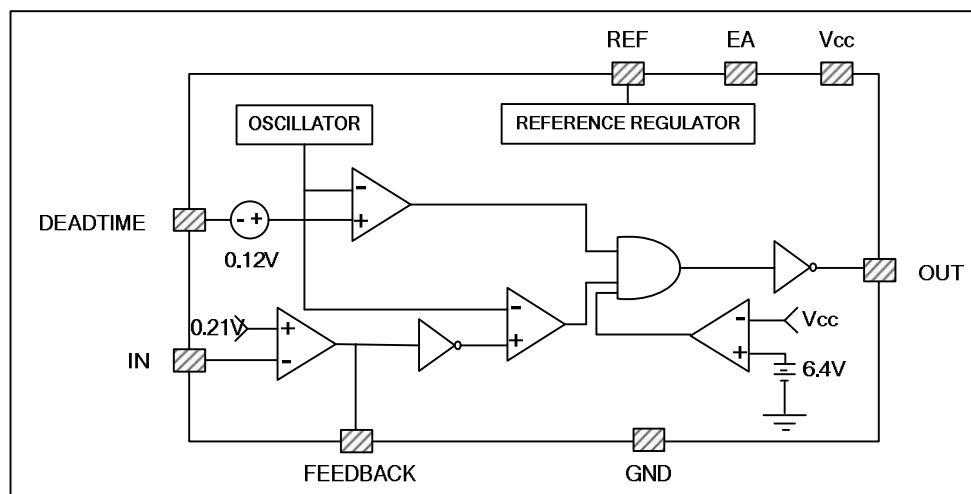
(Unless otherwise noted ,all is over operating free-air temperature Range)

Characteristic	Value	Unit
Supply Voltage	7~40	V
Input Voltage	-0.3~V _{CC} +0.3	V
Operating Ambient Temperature Range	0 ~ 70	°C
Extreme Operating Ambient Temp	-40~85	°C
Operating Junction Temperature	+150	°C
Storage Temperature	-55~150	°C

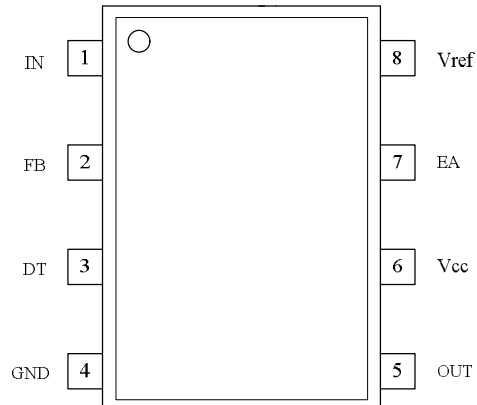
RECOMMENDED OPERATING CONDITION

Characteristic	Value	Unit
Supply Voltage	7~36	V
Operating Ambient Temperature	0 ~ 70	°C

BLOCK DIAGRAM



PIN CONFIGURATIONS



PIN FUNCTIONS

Pin No.	Pin Name	Function
1	IN	Sampling signal input
2	FB	Feedback PWM input
3	DT	Deadtime Control
4	GND	GND
5	OUT	PWM output
6	V _{CC}	Power supply
7	EA	Enable
8	Vref	Internal 5V reference

ELECTRICAL CHARACTERISTICS

(Over recommended operating free-air temperature range, $V_{CC}=12V$, Unless otherwise specified)

Characteristic		Test Conditions	Min	Typ	Max	Unit
Reference Section						
Feedback voltage				0.21		V
Output voltage		$I_o=1mA$		5		V
Input regulation		$V_{CC}=7V$ to 36V		2	50	mV
Output Regulation		$I_o=1$ to 10mA		1	15	mV
Output Voltage change with Temperature		$\Delta T_A=MIN$ to MAX(note 2)		0.2	1	%
Short-circuit output Current		$V_{ref}=0$		35		mA
Characteristic		Test Conditions	Min	Typ	Max	Unit
Oscillator section						
Frequency				180		kHz
Standard Deviation of Frequency				20		%
Amplifier Section						
Input offset Voltage		$V_o(\text{pin } 2)=2.5V$		2	10	mV
Input offset Current		$V_o(\text{pin } 2)=2.5V$		25	250	nA
Input bias Current		$V_o(\text{pin } 2)=2.5V$		0.2	1	μA
Input Voltage Range		$V_{CC}=7V$ to 25 V	-0.3 to $V_{CC}-2$			V
Open-Loop Voltage Amplification		$\Delta V_o=3V$, $V_o=0.5V$ to 3.5V	70	95		dB
Unity-Gain Bandwidth				800		kHz
Rejection ratio		$V_{CC}=25V$, $T_A=25^\circ C$	65	80		dB
Output Section						
V_{OUT}	Low			0.1	0.3	V
	High	$I_o = -200mA$		$V_{CC}-1.5$	$V_{CC}-2.5$	V
Dead Time Control Section						
Maximum duty cycle, each output		$V_I(\text{pin } 3)=0$		85		%
Input threshold Voltage(pin3)		Zero duty Cycle		3	3.3	V
		Maximum duty cycle	0			V
Grounding resistance				80		k Ω
PWM comparator Section						
Input Threshold Voltage(pin 2)		Zero Duty cycle		0.1	0.2	V
Input sink current (pin 2)		$V_{pin } 2= 0.7V$	0.3	0.7		mA
Total Device						
Standby supply current	$V_{CC}=12V$	All Inputs and outputs open		6	10	mA
	$V_{CC}=25V$	EA High		9	15	mA
		EA Low		0.1		mA
Under Voltage Look Out						
Upper threshold voltage		$T_A=25^\circ C$	6.2	6.4	6.6	V
Switching Characteristics, $T_A=25^\circ C$						
Output Voltage rise time				100	200	ns
Output Voltage fall time				100	200	ns
EA Section						
Enable	Low		0		0.2	V
	High		2		5	V
EA Grounding resistance				20		k Ω

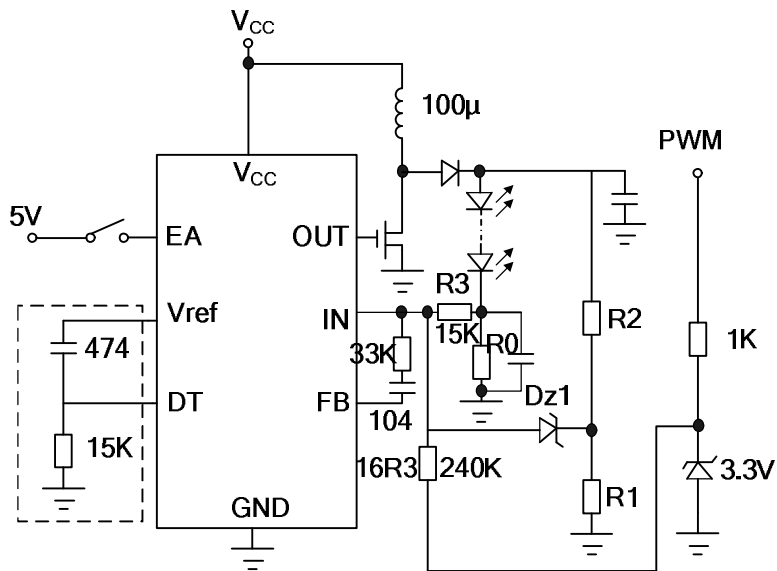
note 1: All typical Values except for temperature coefficient are at $T_A=25^\circ C$.

note 2: For conditions shown as MIN or MAX, use appropriate value under recommended operating conditions.

note 3: Duration of the short-circuit should not exceed one second.

[illegible]
$$I_{LED} = \frac{0.21}{R_0}$$
$$I_{LED} = \frac{0.21 - \frac{V - 0.91}{R_4} \times R_3}{R_0}$$
$$V_{OF} = \frac{Dz1}{R1} (R1+R2)$$

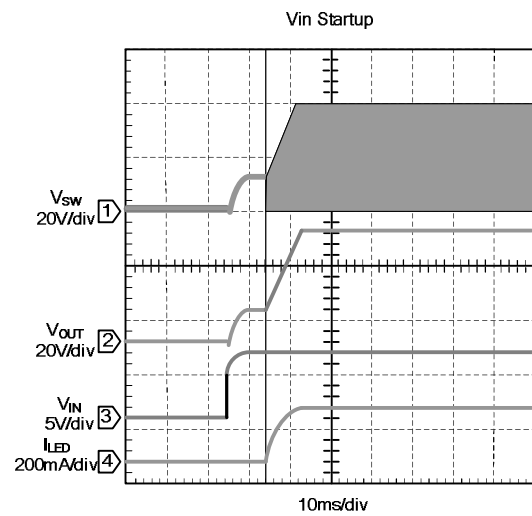
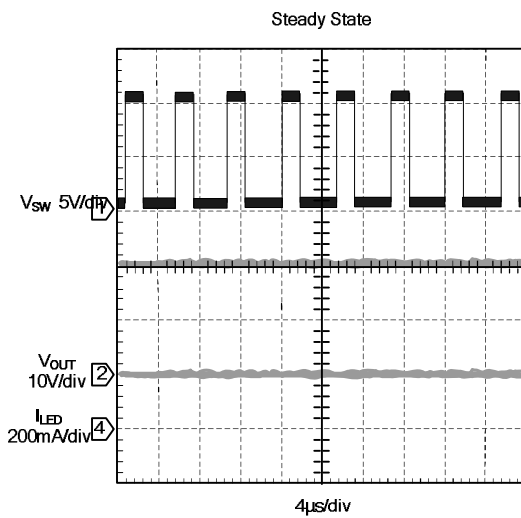
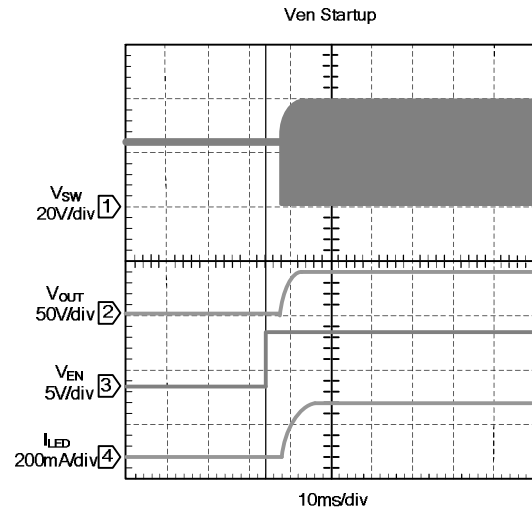
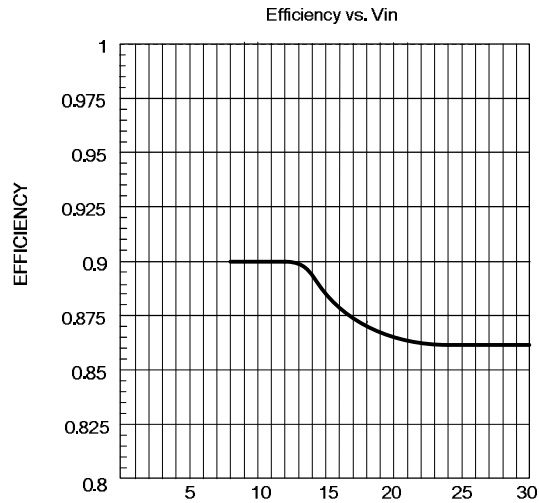
TYPICAL APPLICATION CIRCUIT②



PWM最大电流为
$$I_{LED} = \frac{17 \times 0.21}{16R0}$$

TYPICAL PERFORMANCE CHARACTERISTICS

$V_{IN}=12V$, 14 LEDs in series, 200mA / string, unless otherwise noted.



PACKAGE DIMENSIONS

