GENERAL DESCRIPTION

OB3671AZ is a high performance driver with advanced features to provide high efficiency control to remove/suppress the 100/120 Hz current ripple for LED lighting applications.

OB3671AZ integrates a 100V MOSFET，and the LED current is recommended to set below 0.5A. It controls the internal MOSFET drain voltage to minimize power dissipation while suppressing current ripple.

OB3671AZ allows user to set up maximum LED current by the sensing the resistor between CS pin and ground. It also allows user to set up the maximum cathode voltage of LED string via a resistor between the drain of the DRAIN pin and LEDN pin.

OB3671AZ offers comprehensive protection coverage with features including LED open loop protection, LED short circuit protection, current limiting, VCC under voltage lockout (UVLO), comp floating protection, over temperature protection etc.

OB3671AZ supports current dimming from 100% to 5%.
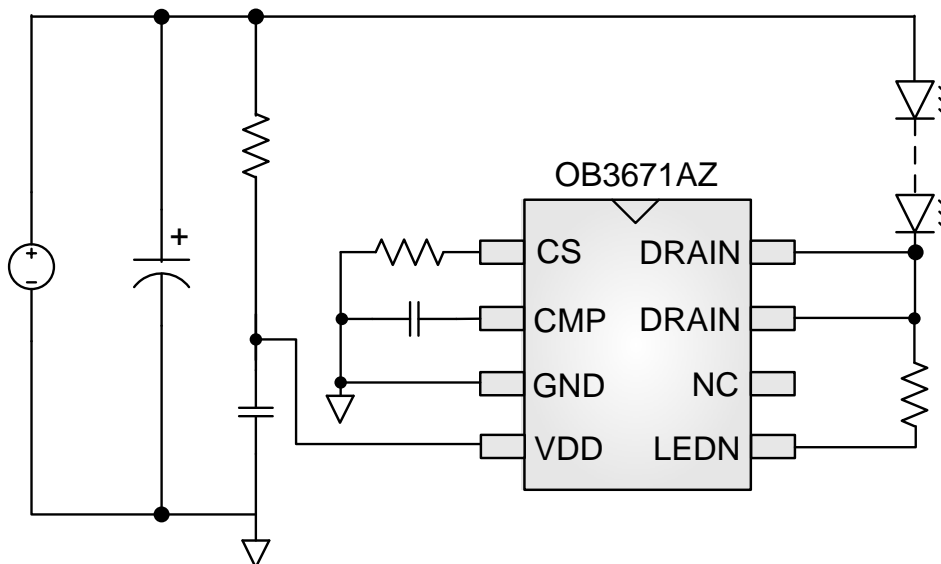
OB3671AZ is offered in ESOP-8 package.

FEATURES

- Driver for 100/120Hz current ripple removal/suppress
- Integrated 100V MOSFET
- Programmable maximum LED current
- Built in VCC voltage clamping
- Supports wide dimming range: 5%-100%
- Supports hot-plug
- LED short protection with programmable threshold
- VCC under voltage lockout (UVLO)
- Comp floating protection
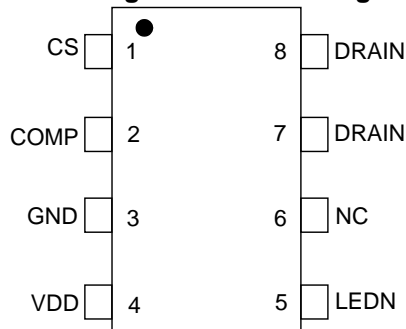- Over temperature protection
- ESOP-8 Package

APPLICATIONS

- LED lighting

TYPICAL APPLICATION

GENERAL INFORMATION

Pin Configuration Pin Configuration

Ordering Information

Part Number	Description
OB3671AZBP	8 Pin ESOP, Halogen-free in Tube
OB3671AZBPA	8 Pin ESOP, Halogen-free in T&R

Note: All Devices are offered in Halogen-free Package if not otherwise noted.

Package Dissipation Rating

Package	RθJA (℃/W)
ESOP-8	75

Marking Information

Recommended Operating Condition

Symbol	Parameter	Range
VDD	VDD Supply Voltage	7V to 14V

Absolute Maximum Ratings

Parameter	Value
VDD Voltage	-0.3 V to 20V
CS Input Voltage	-0.3 V to 7V
COMP Input Voltage	-0.3 V to 7V
LEDN Input Voltage	-0.3 V to 80V
DRAIN Input Voltage	-0.3 V to 100V
Min/Max Operating Junction Temperature T_J	-40 to 150 ℃
Operating Ambient Temperature T_A	-40 to 85 ℃
Min/Max Storage Temperature T_{stg}	-55 to 150 ℃
Lead Temperature (Soldering, 10secs)	260 ℃

Note: Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.
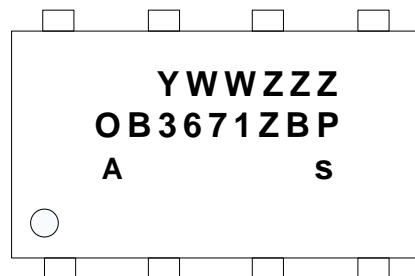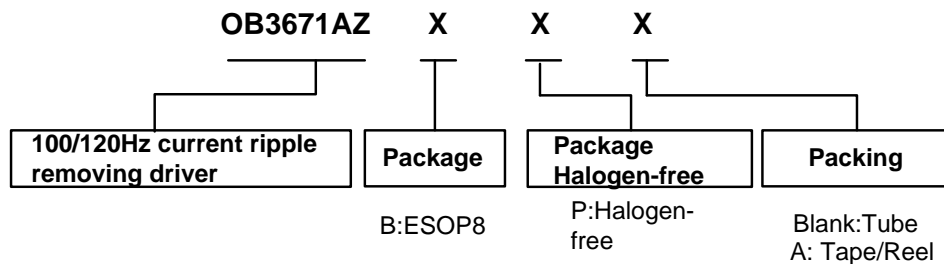
TERMINAL ASSIGNMENTS

Pin Num	Pin Name	I/O	Description
1	CS	I	Current Sensing Terminal
2	COMP	O	Loop Compensation Terminal
3	GND	P	Ground
4	VDD	P	Power Supply Input
5	LEDN	I	MOSFET Drain Voltage Detection
6	NC		
7/8	DRAIN	I	Integrated MOSFET Terminal

BLOCK DIAGRAM
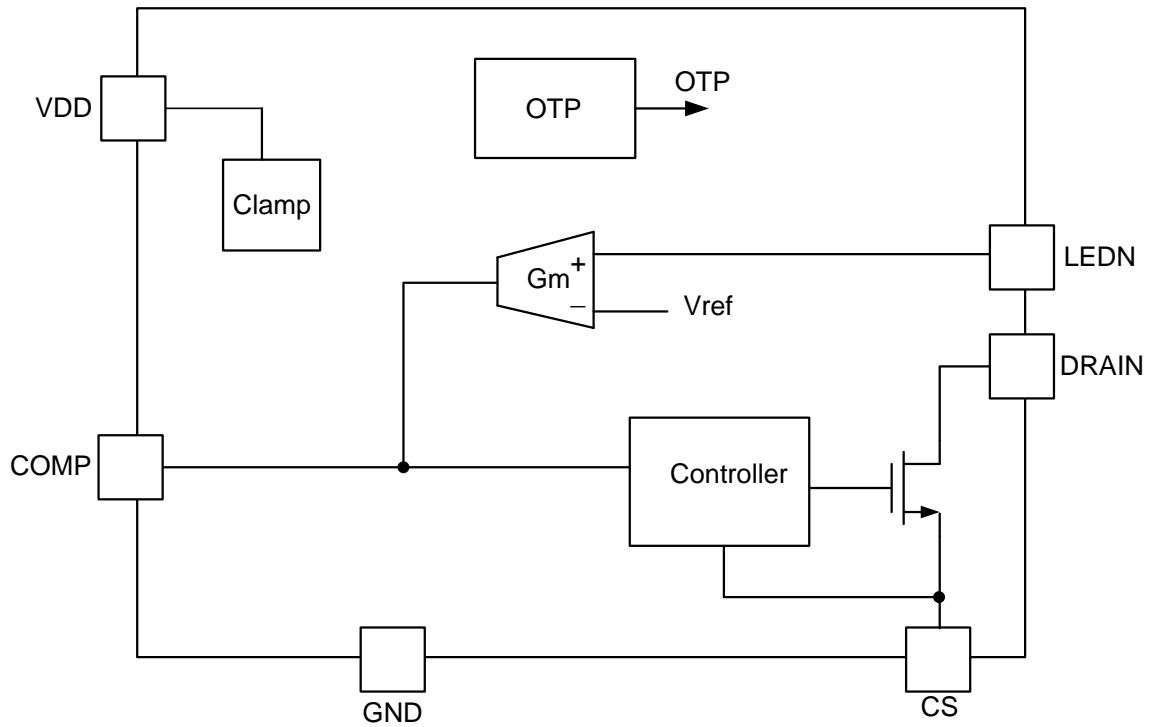
ELECTRICAL CHARACTERISTICS

(TA = 25℃, VCC=12V, if not otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
Supply Voltage (VDD) Section						
I$_{oper}$	Operation current	no loading		320	400	uA
UVLO(OFF)	VCC under voltage lockout exit		6.7	7.5	8.3	V
UVLO(ON)	VCC under voltage lockout entry		4.9	5.5	6.1	V
VCC_CLAMP	VCC clamping voltage	VCC current 1mA	12	13.5	15	V
Loop Control Section						
Gm	Transconductance of EA			25		us
Vth_ocp	Over current threshold		215	250	285	mV
Protection Section						
TLED_short	LED short protection entry time		78	130	182	us
TLED_short_recover	LED short protection hiccup time		7.5	12.5	17.5	ms
Vscp	LED short protection threshold	LEDN voltage	11.5	12.5	13.5	V
Vdrain_lmt	MOS drain voltage limit			6.7		V
Rledn_gnd	LEDN-GND equivalent resistance			350		kΩ
Vth_cs_open	CS protection threshold for LED open			7		mV
Vth_open_recover	CS threshold for LED open recover			30		mV
OTP Section						
OTP	OTP trigger threshold			150		℃
Hysteresis				30		℃

Power MOSFET Section			
Parameter / **Product**	**BVdss(V)** MOSFET Drain-Source Breakdown Voltage		
	Min	Typ.	Max
OB3671AZBP	100		

OPERATION DESCRIPTION

OB3671AZ is a high performance driver with advanced features to provide high efficiency control to remove/suppress the 100/120Hz current ripple for LED lighting applications.

OB3671AZ controls minimum drain voltage of the internal MOSFET to ensure it works in saturation region. Then the current ripple is transferred to voltage ripple on the internal MOSFET to suppress current ripple.

CS Resistor Set

The input voltage of CS pin should be less than 250mV (typical). For the lowest power dissipation and the best current ripple suppression effect, 150mV is the suggested value. The CS resistor can be set as follow:

$$Rcs = \frac{150mV}{I_{LED}}$$

(I_{LED} is the LED current)

LED Current Limit

The voltage of CS pin is limited to 250mV (typical) internally. So the current limitation is 0.25V/Rcs. Current limit can protect the chip when LED is short connected or HOT-PLUG.

MOSFET Drain Voltage Limit

OB3671AZ detects the drain voltage of internal MOSFET, and limits the maximum voltage of MOSFET to prevent high power loss. The limited voltage can be calculated as follow:

$$V_{DRAIN\_LMT} = 6.7V \times (1 + \frac{R_{LEDN}}{350kohm})$$

LED Short Protection

OB3671AZ detects LED short by LEDN pin. When the LEDN pin voltage exceeds the short protection threshold and holds for more than 130us (typical), OB3671AZ shuts down the internal MOSFET. The short state is reset after 12.5ms (typical) and OB3671AZ checks whether the LED short condition has been removed. If it is still in short condition, the above protection procedure is repeated till the short condition is removed.

The LED short protection threshold can be set via a resister between DRAIN pin and LEDN pin, and it can be calculated as follow:

$$V_{SCP} = 12.5V \times (1 + \frac{R_{LEDN}}{350kohm})$$

R_{LEDN} is suggested at least 1k ohm.

LED Open Protection

OB3671AZ detects CS pin voltage. When the CS pin voltage is lower than 7mV (Typical), OB3671AZ pulls up the CMP pin to 5V and the internal MOSFET is fully conducted.

After LED open protection is triggered, OB3671AZ continues to monitor CS pin voltage. When the CS pin is higher than the threshold 30mV (Typical), the CMP pin is released from being pulled high.

Over Thermal Protection

OB3671AZ monitors the junction temperature. When the temperature is higher than 150 ℃ (typical) , the internal MOSFET is fully conducted until the temperature decreases to 120℃ (typical).

PACKAGE MECHANICAL DATA
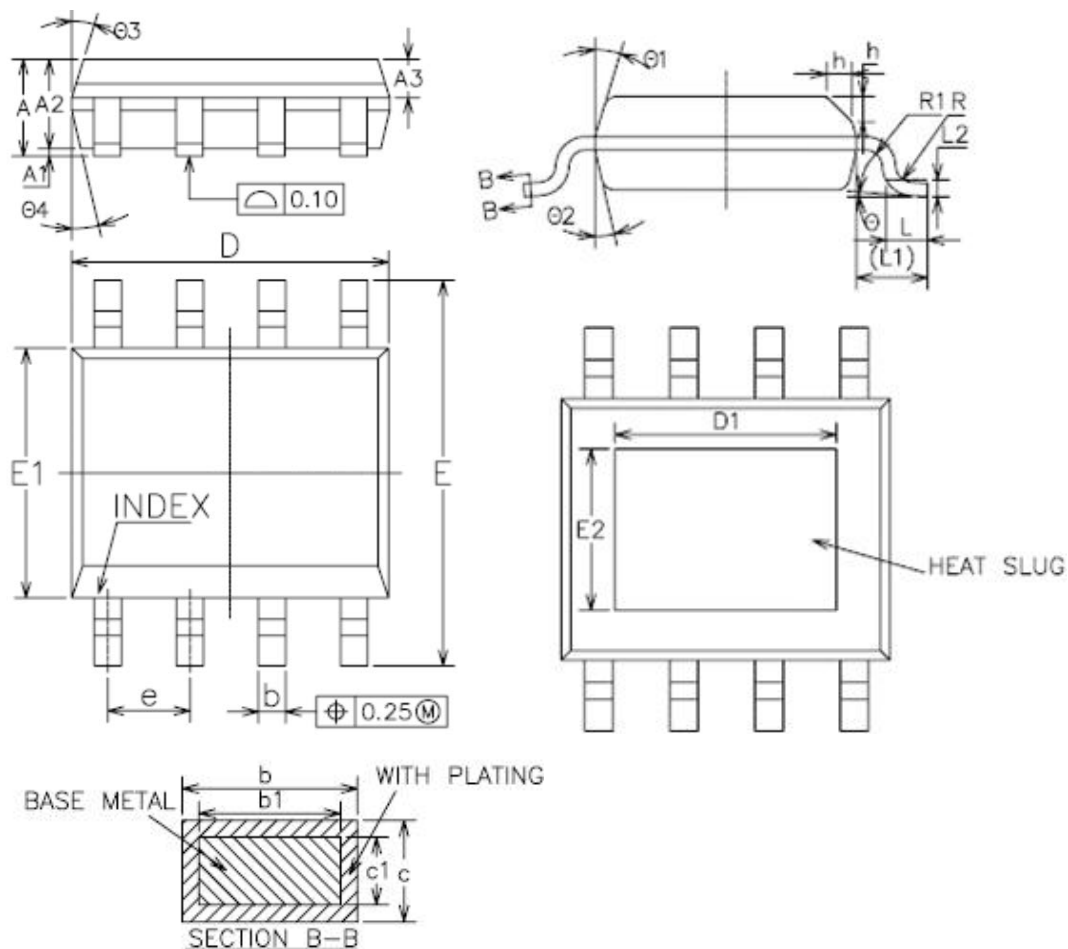
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.000	0.250	0.000	0.010
A2	1.250	1.650	0.049	0.065
b	0.310	0.510	0.012	0.020
c	0.100	0.250	0.004	0.010
D	4.700	5.150	0.185	0.203
D1	3.100	3.500	0.122	0.138
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
E2	2.200	2.600	0.087	0.102
e	1.27(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0º	8º	0º	8º

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