GENERAL DESCRIPTION

OB3631A is a protection IC with features to provide switch power driver work in safety state. OB3631A offers comprehensive protection coverage with auto-recovery features including line voltage brown out and over voltage protection, over temperature protection through NTC resistor, etc.
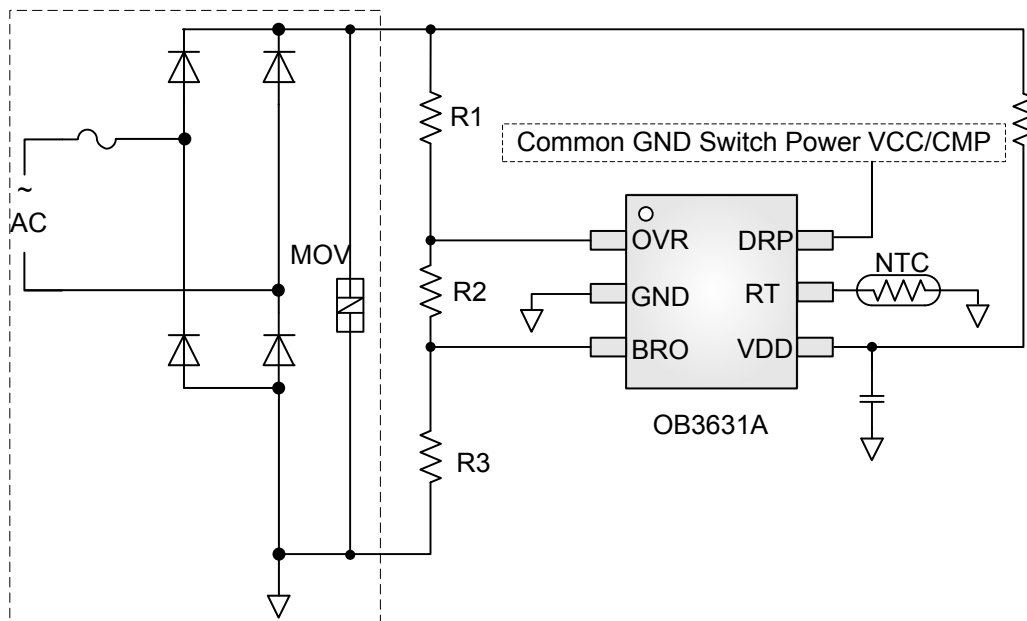
FEATURES

■ Line voltage brown out protection

■ Line voltage over voltage protection

■ Over temperature protection

APPLICATIONS

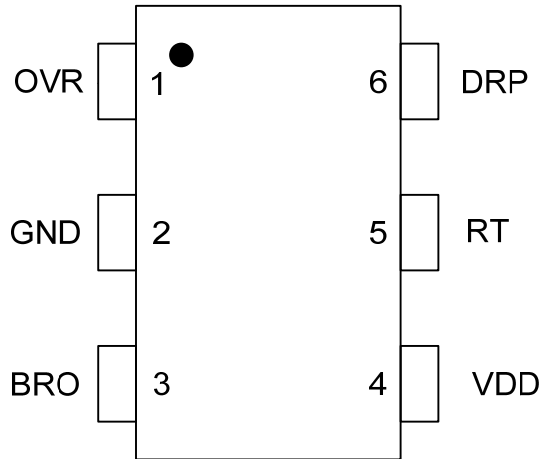■ Switch power

TYPICAL APPLICATION

NOTE：

Line voltage is detected by a resistor divider with R1/R2/R3, and R1 resistance range is suggested from 1M to 5M.

For brownout 100Vac and Line OVP 300Vac application, the resistor divider is selected R1=1M*2(2pcs resistor series) ,R2=2.1K,R3=7.5K,and R1 package should be 1206.

GENERAL INFORMATION

Pin Configuration
The pin map is shown as below for SOT23-6.

OVR	1		6	DRP
GND	2		5	RT
BRO	3		4	VDD

Ordering Information

Part Number	Description
OB3631AMP	SOT23-6, Halogen-free, T&R

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

Package Dissipation Rating

Package	RθJA (℃/W)
SOT23-6	200

Absolute Maximum Ratings

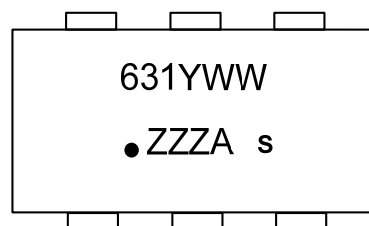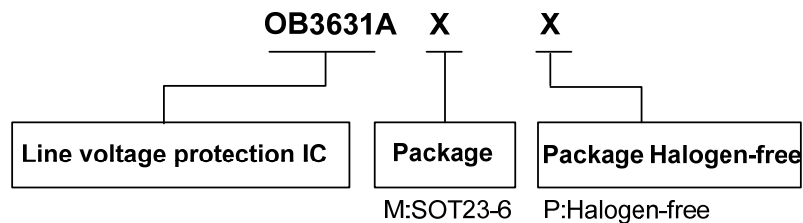| Parameter	Value
VDD Voltage	-0.3 to 20V
DRP Voltage	-0.3 to 40V
OVR Input Voltage	-0.3 to 7V
BRO Input Voltage	-0.3 to 7V
RT Voltage	-0.3 to 7V
Min/Max Operating Junction Temperature T_J	-40 to 150 ℃
Min/Max Storage Temperature T_{stg}	-55 to 150 ℃
Lead Temperature (Soldering, 10secs)	260 ℃

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.

Marking Information

OB3631A X   X

| Line voltage protection IC | Package | Package Halogen-free |

M:SOT23-6   P:Halogen-free

631YWW

●ZZZA s

Y: Year Code
WW: Week Code(01-52)
ZZZ: Lot Code
A: Character Code
s: Internal Code(Optional)

TERMINAL ASSIGNMENTS

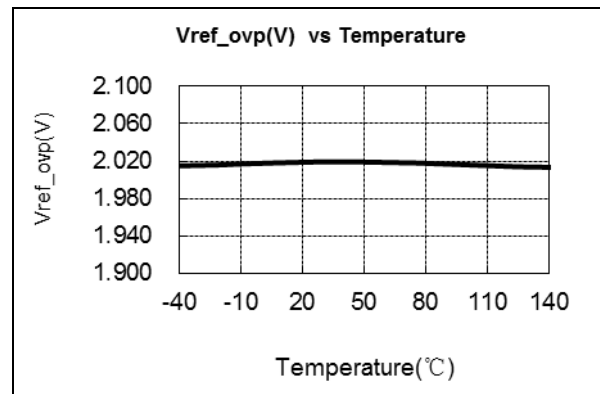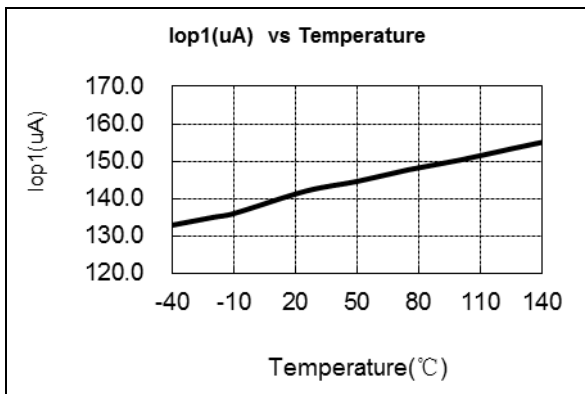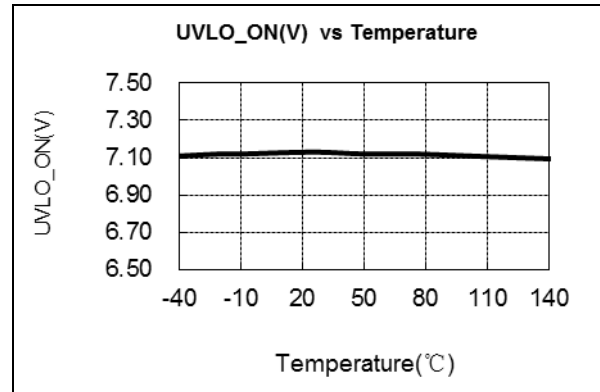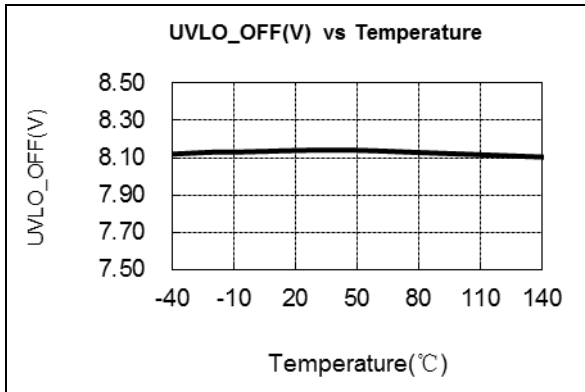| Pin Num	Pin Name	I/O	Description
1	OVR	I/O	Line Voltage OVP and Recovery Control
2	GND	P	Ground
3	BRO	I/O	Line Voltage Brown-in/Brown-out Control
4	VDD	P	Power Supply
5	RT	I/O	Temperature Sensing Through NTC Resistor
6	DRP	I/O	Drop-down Protection PIN

BLOCK DIAGRAM
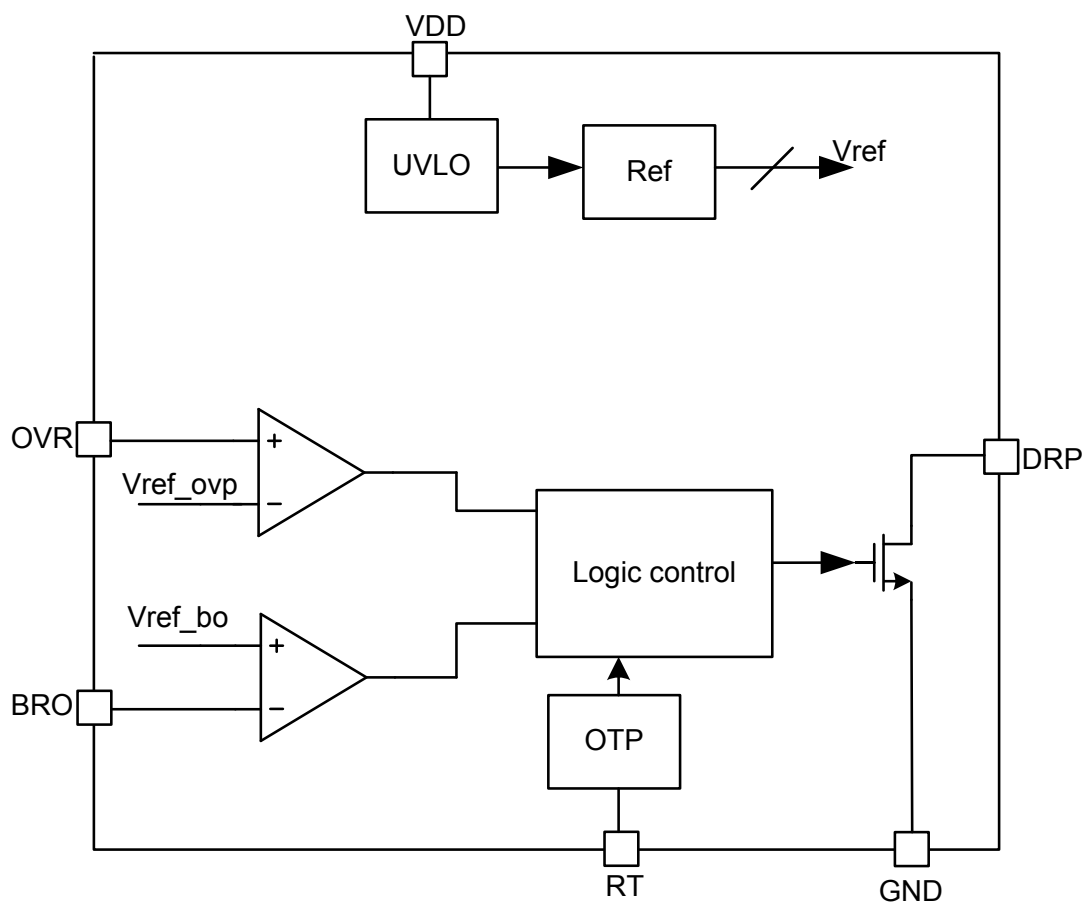
ELECTRICAL CHARACTERISTICS

(TA = 25℃, VDD=11V, if not otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Current Consumption						
Operating supply current 1	Iop1	VDD=11V RT connect res to GND	120	150	180	uA
Operating supply current 2	Iop2	VDD=11V RT floating	80	100	120	uA
VDD &UVLO						
UVLO	UVLO(OFF)		7	8	9	V
UVLO Hysteresis	UVLO(Hys)			1		V
VDD clamp voltage	Vclamp		11	12	13	V
VDD clamp current	Iclamp	VDD>13V	28			mA
Protection Reference						
Reference voltage1	Vref_bo		0.475	0.5	0.525	V
Hysteresis				50		mV
Reference voltage2	Vref_ovp		1.95	2	2.05	V
Hysteresis				100		mV
DRP Switch on resistance						
DRP res	Drp_res			50		Ω
OTP						
Output current of RT pin	I_RT		40	50	60	uA
OTP Threshold voltage	Vth_OTP		0.95	1	1.05	V
OTP Threshold hysteresis				200		mV

CHARACTERIZATION PLOTS

UVLO_OFF(V) vs Temperature

UVLO_ON(V) vs Temperature

Iop1(uA) vs Temperature

Vref_ovp(V) vs Temperature

Vref_bo(mV) vs Temperature

Vth_OTP(mV) vs Temperature

IRT(uA) vs Temperature

.
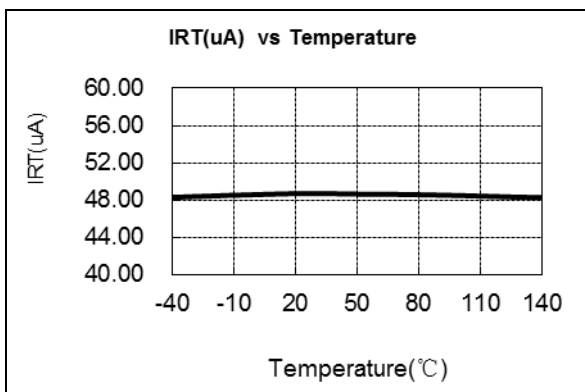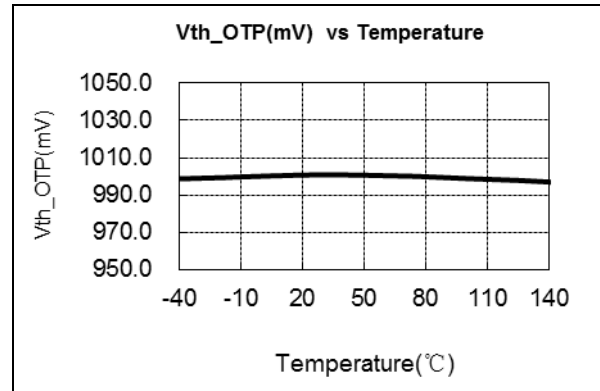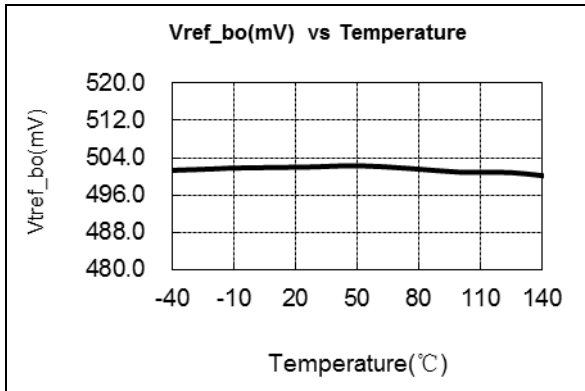
OPERATION DESCRIPTION

OB3631A is a protection IC with features to provide LED driver work in safety state. OB3631A offers comprehensive protection coverage with auto-recovery features including line voltage brown out and over voltage protection, over temperature protection through NTC resistor, etc

Start up Control

Startup process is realized by charging VDD capacitor. When VDD voltage reaches up to UVLO(OFF), the system starts to operate. A 12V (typical) clamp circuit is applied to clamp VDD voltage.

Brown out

OB3631A detects the states of LED system line voltage. When the voltage at BRO pin drops below a threshold of approximately 0.5V for 20mS (typical), the Brown out protection function is activated and the DRP pin is drop down. This state can be reset when the voltage of BRO pin exceeds a threshold of approximately 0.55V (typical).

Line OVP

During normal operation, when the voltage at OVR pin exceeds a threshold of approximately 2V (typical), the line over voltage protection function is activated and the DRP pin is drop down immediately. This state can be reset when the voltage of OVR pin drops below a threshold of approximately 1.9V (typical) for 20mS (typical).

External OTP

Accurate detection of external OTP through RT resistor, for external OTP detection, the 50uA (typical) current flows out from RT pin. When VRT< 1V (typical), external OTP protection is triggered, the DRP pin is drop down. This state can be reset when the voltage of BRO pin exceeds a threshold of approximately 1.2 V (typical).

PACKAGE MECHANICAL DATA
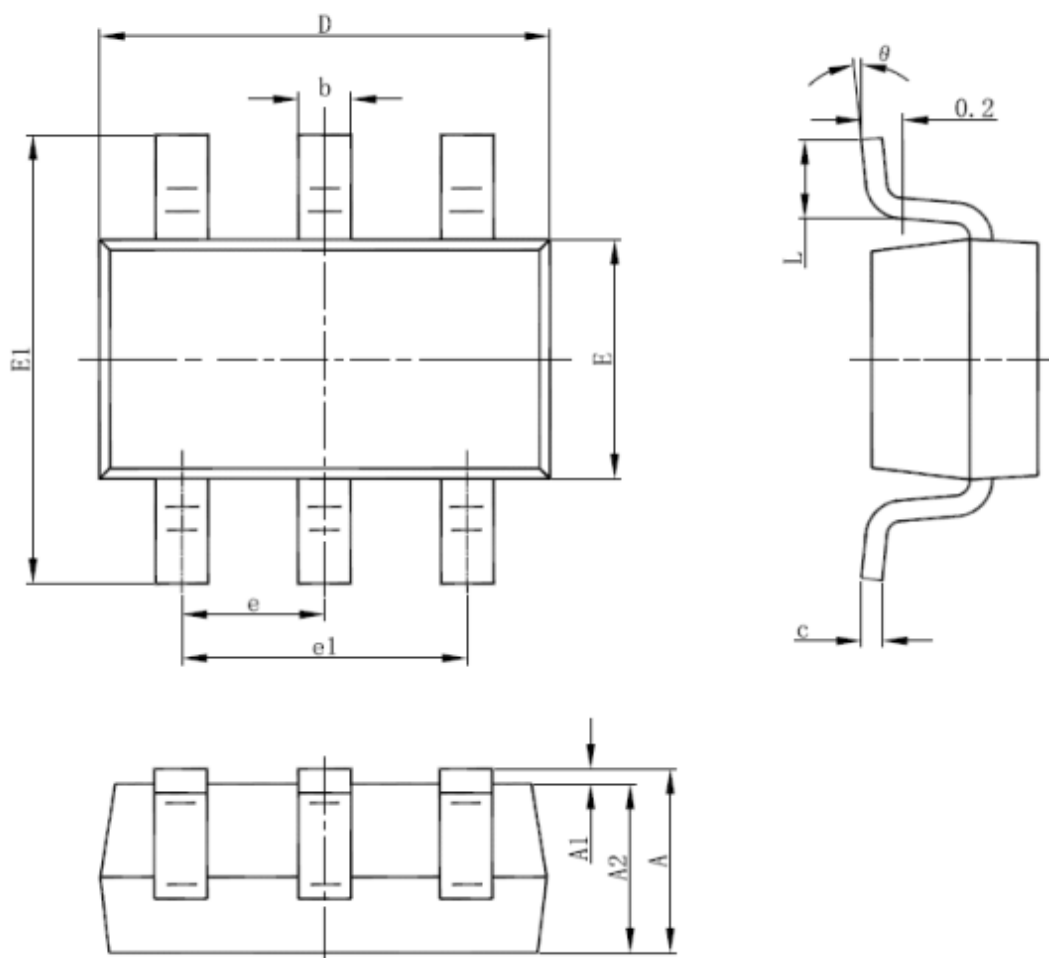
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.000	1.450	0.039	0.057
A1	0.000	0.150	0.000	0.006
A2	0.900	1.300	0.035	0.051
b	0.300	0.500	0.012	0.020
c	0.080	0.220	0.003	0.009
D	2.800	3.020	0.110	0.119
E	1.500	1.726	0.059	0.068
E1	2.600	3.000	0.102	0.118
e	0.950 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0º	8º	0º	8º

IMPORTANT NOTICE

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