BL8585

WIDE RANGE, LINEAR LED DRIVER

DESCRIPTION

The BL8585 is a high-voltage adjustable current source with accurate temperature compensation. The device is designed to provide a constant current source determined by an external sense resistor R_{sense}. The current is adjustable from 10mA to 20mA with less than 10% error while input changes from 5V to 90V. With an external resistor (R1 in Figure 1) between VA and IS pin, the heat in the IC can be significantly reduced while keeping the summation of IC and R1 current to be constant. This is extremely useful in the area that power lines are not very stable. A typical application for the BL8585 is to drive LEDs with a constant current varies from 10-20mA. They can also be used in parallel to provide higher current according to the bias. This device is available in TO-92 package.

FEATURES

- Wide operation range: from 5V to 90V(V_{A-B})
- TO-92 packages available
- I_{LED} can be programmed from 10mA to 20mA via changing R_{sense}
- Power dissipation can be adjusted
- Easy to use, only 3 pins and very little external components are needed
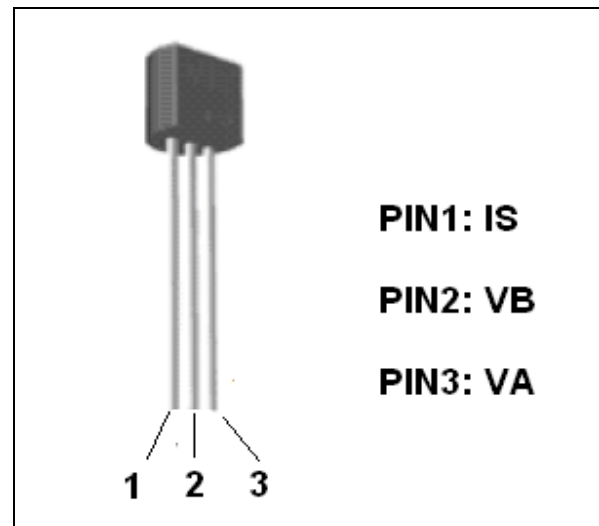- Can be paralleled for higher current
- Temperature compensated

APPLICATIONS

- Industrial lamp indicators
- LED driver
- Accent lighting
- Automotive
- Constant current source
- Constant current sink

TYPICAL APPLICATION CIRCUIT

PIN CONFIGURATIONS

PIN1: IS

PIN2: VB

PIN3: VA
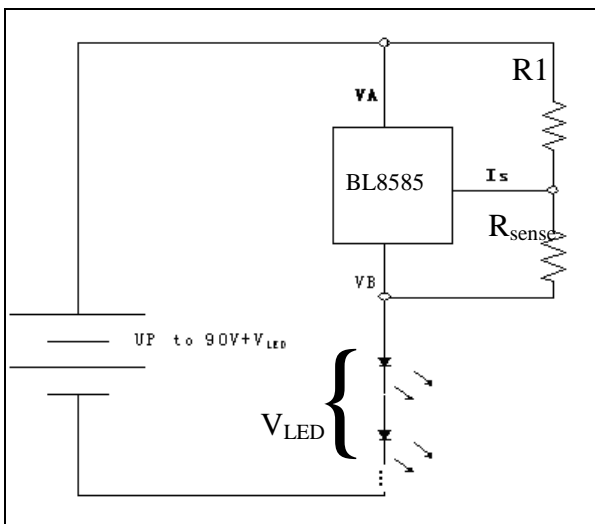
BL8585

MARKING INFORMATION

Marking information		
Marking	**Description**	
8585 YYBZZ	8585	Product code
	YY	Lot NO.
	B	FAB code
	ZZ	Date code

ORDERING INFORMATION

| BL8585 ☐1 ☐2 ☐3	
Code	Description
☐1	Temperature & Rohs: C: -40~85°C,Pb Free Rohs Std.
☐2	Package type: H: TO-92
☐3	Packing type: PT: Paper type BG: Bag (TO-92)

ABSOLUTE MAXIMUM RATING

Name	Symbol	Value	Unit
Max Supply Voltage	V_{A-B}	90	V
Thermal resistance	Θ_{JA}	170	℃/W
Maximum Junction temperature	T_J	150	℃
Storage temperature	Tst	-55 to150	℃

ELECTRICAL CHARACTERISTICS

Symbol	Item	Conditions	Min	Typ	Max	Unit
V_{A-B}	Operating Input Voltage	N/A	5		90	V
I_{A-B}	Current regulation	V_{A-B}=5-90V, I_{SET}=20mA	-10		+10	%
V_{IS}	Current sense voltage			0.6		V
T_J	Operating junction temperature		-45		125	℃

BLOCK DIOGRAM
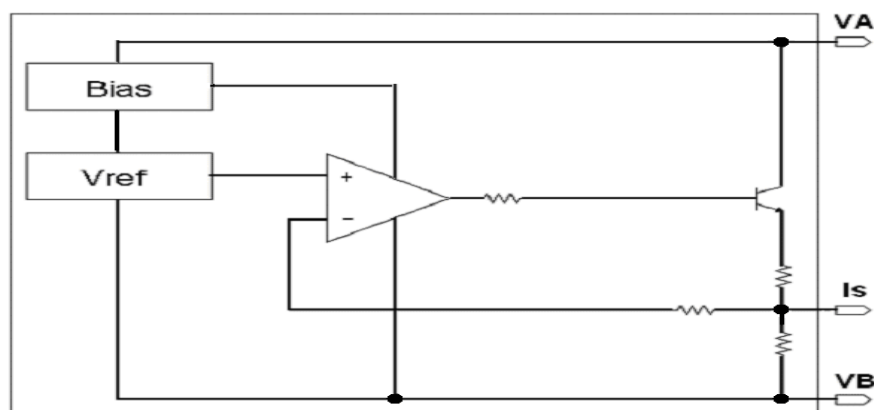
OPERATION

The BL8585 is a high voltage integrated constant current driver. It can operate in a wide range from 5V to 90V, and the output current can be programmed just by change the sense resistor. This module provides a precise regulated output current, the typical application is showed in figure 1.

As the BL8585 is a linear power supply, with high input voltage, the power dissipation should be considered. For example, if the set current is 20mA, when the V_{A-B} is 5V, the module dissipation

$$P_D = V_{A-B} \times I_{SET} \Rightarrow P_D = 0.1W$$

If the V_{A-B} is 90V, the power dissipation is as high as 1.8W. An external resistor R1 can be added to reduce the power dissipation of the BL8585. Then the power dissipation on the IC becomes

$$P_D \cong V_{A-B} \times (I_{SET} - \frac{V_{A-B} - V_{Sense}}{R_1})$$

When the ambient temperature is fixed, from thermal resistance value, the maximum power dissipation of the IC can be calculated. Say the maximum allowed temperature increase is 50°C, with TO-92 package (170°C/W thermal resistance), the maximum allowed power dissipation is 0.29W. Assume the maximum V_{A-B} is 50V, I_{set} = 20mA, and V_{sense} = 0.6V. Then

$$R_1 = (V_{A-B} - V_{sense})/(I_{SET} - \frac{P_D}{V_{A-B}}) = 3.5k\Omega$$

R1's power requirement can be calculated by

$$P_{R_1} \cong \frac{V_{A-B}^2}{R_1} = 0.71W$$

Rsense can be calculated from sense voltage and current set:
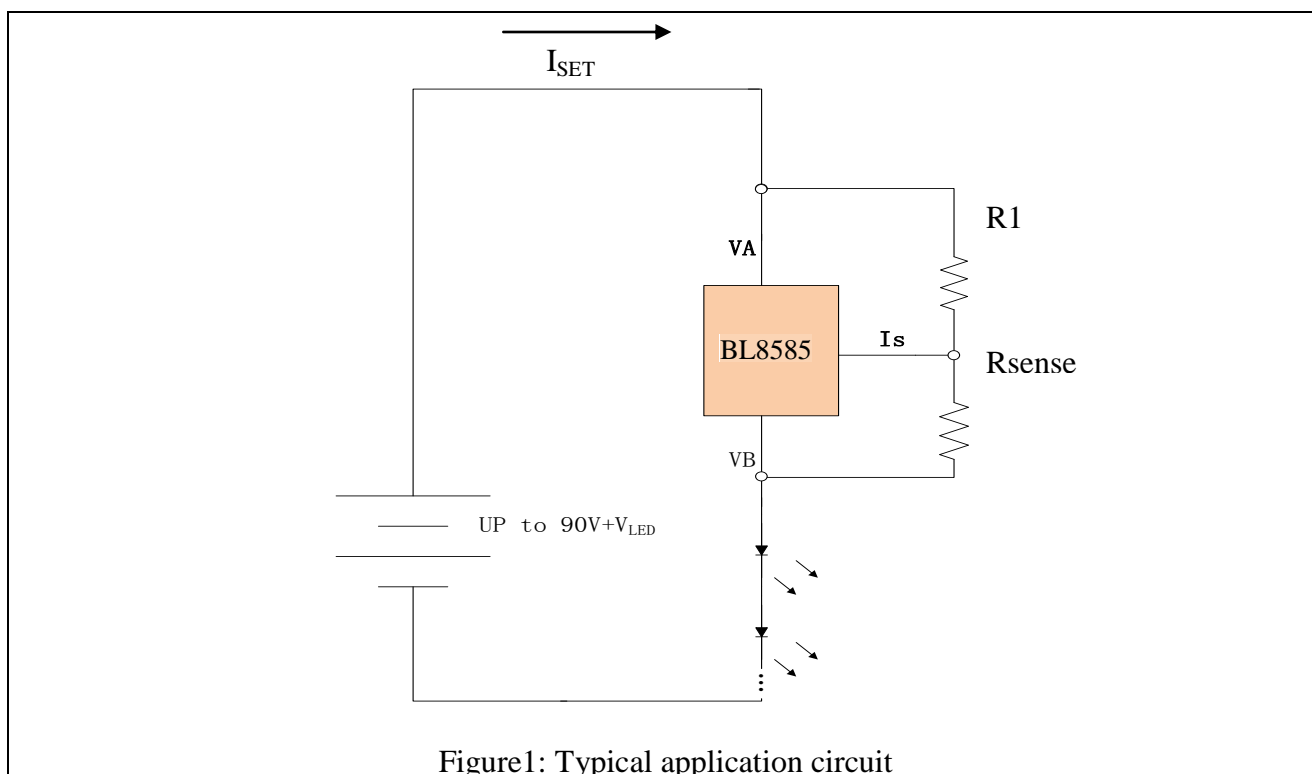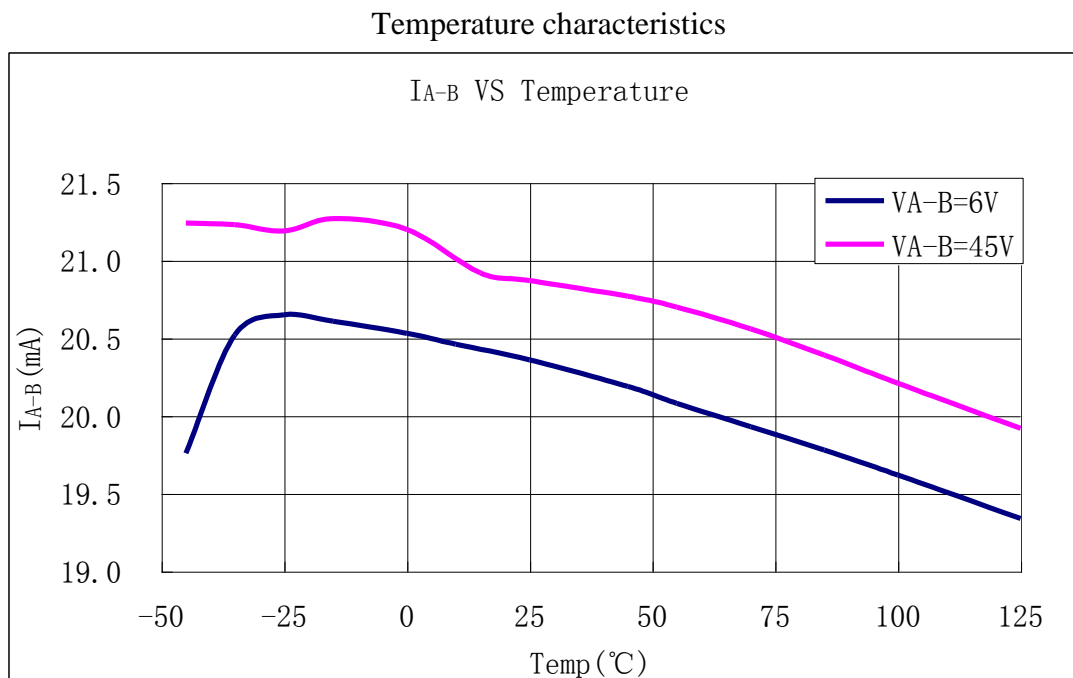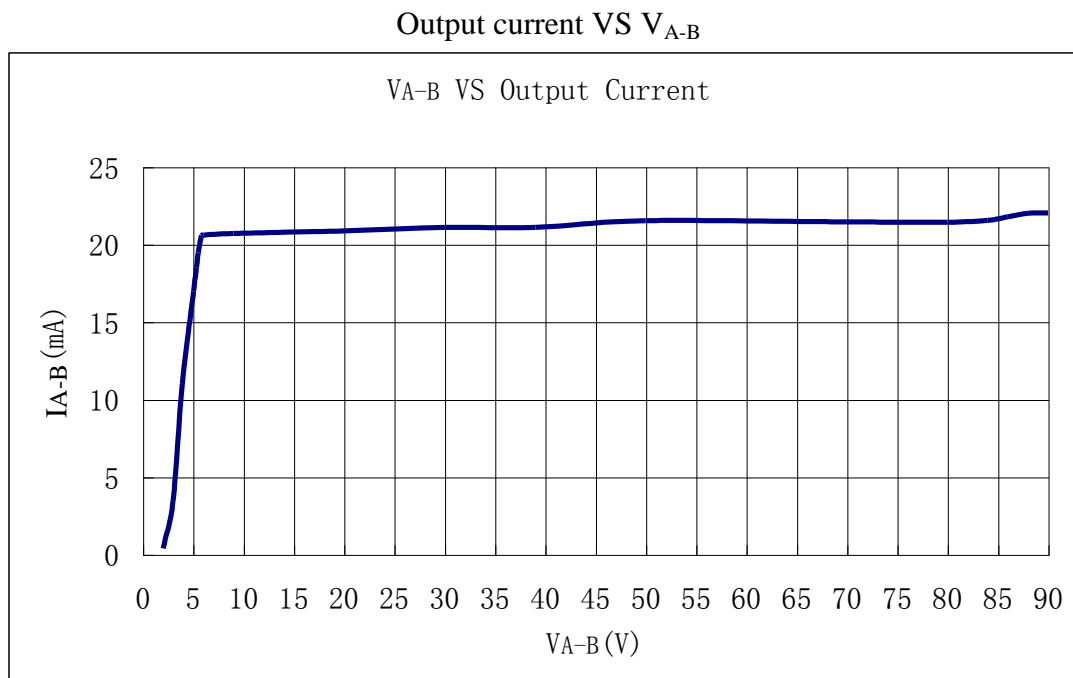
$$R_{sense} = \frac{V_{IS}}{I_{SET}} = 30\Omega$$

Figure1: Typical application circuit

PERFORMANCE CHARACTERISTICS

(All the test done at I_{SET}=20mA)

Output current VS V_{A-B}
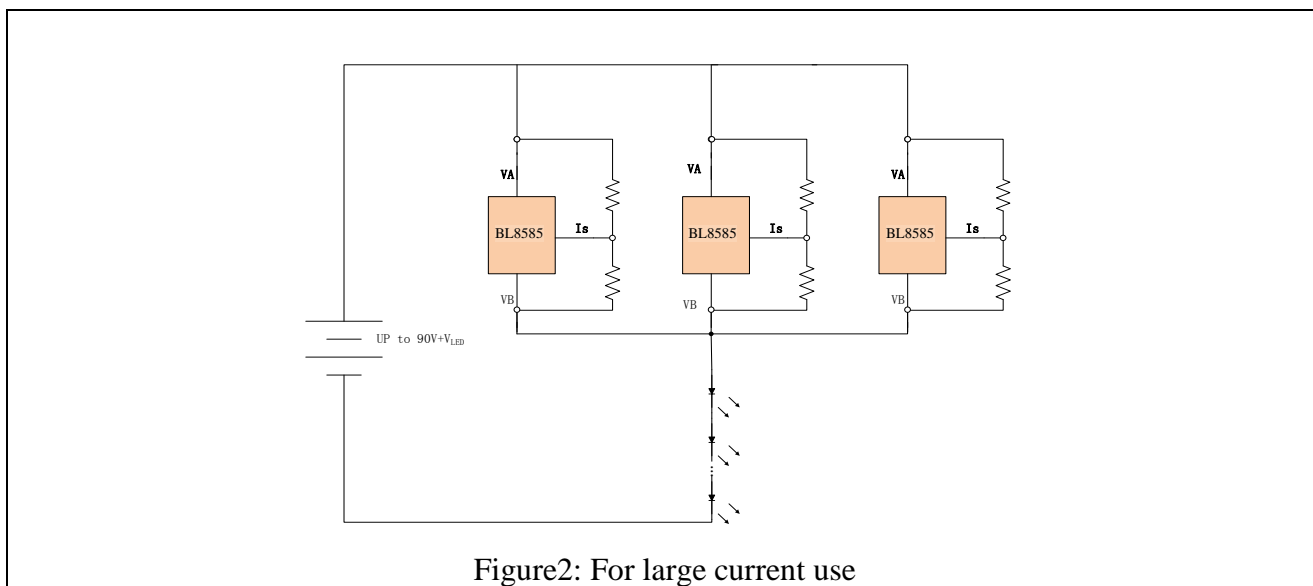

Temperature characteristics

APPLICATION CIRCUITS
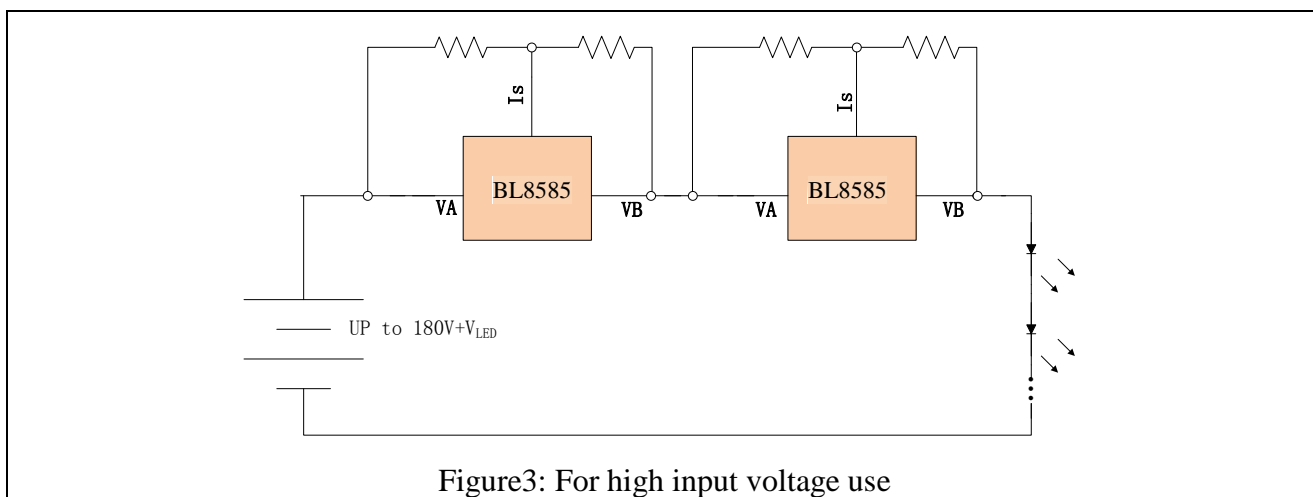

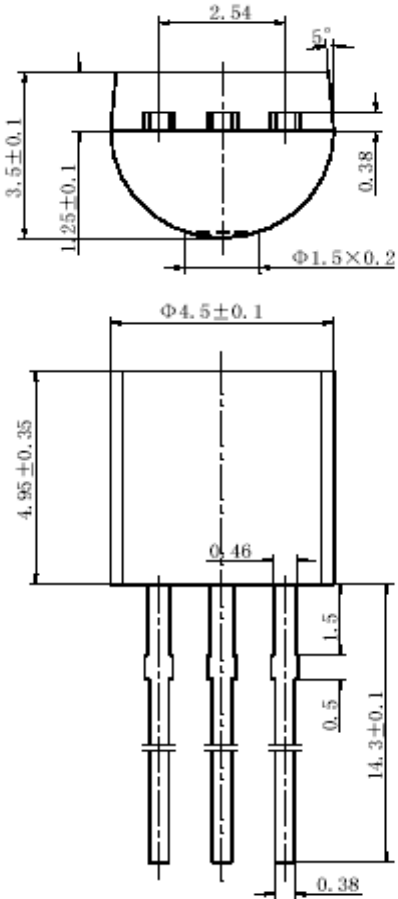Figure2: For large current use

Figure3: For high input voltage use
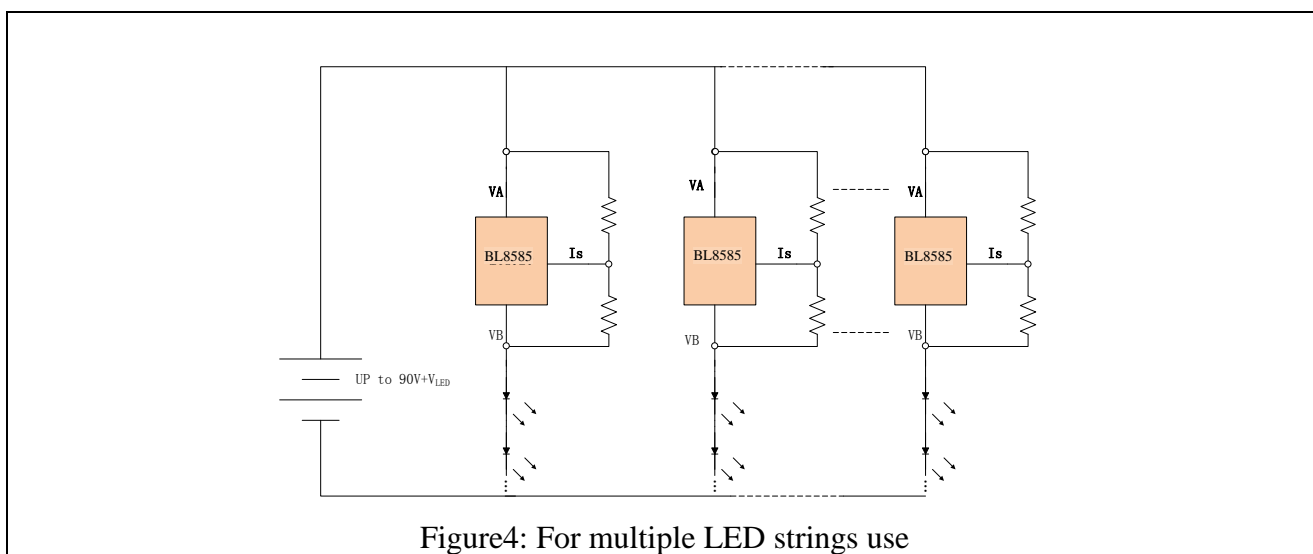
Figure4: For multiple LED strings use

PACKAGE INFORMATION

Package	TO-92	Devices per reel	3000Pcs	Unit	mm

Package dimension：