# 20/30mA Constant Current Regulator

## General Description

VAS1082 is a wide input range constant current LED driver to provide cost-effective solution for advertising light boxes, landscape lighting and other LED illumination application. For common application, VAS1082 needs no external components. For high current application, several VAS1082 can be connected in parallel to deliver higher output power.

VAS1082 can achieve 85% full setting current with only 1.3V input voltage, with this feature, it is ideal for applications with extremely low power supply voltage. Integrated over temperature protection, the LED current will automatically reduce when the die temperature reaches 140℃, and shut down when the die temperature reaches 160℃.

VAS1082 is available with SOT-23 package.

## Application

- Advertising light boxes
- Landscape lighting
- The low side current sink
- Ideal constant current source

## Features

- Wide input range from 1.2V to 40 V
- Simple application circuits
- Obtain larger output current in parallel
- ±5% current accuracy
- Over-Temperature-Protection
- SOT-23 package

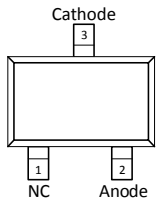
## Ordering Information

| Order Number | Package Type | Temp. Range |
|---|---|---|
| VAS1082IC03E-20 | SOT-23 | -40 ℃ to 85 ℃ |
| VAS1082IC03E-30 | SOT-23 | -40 ℃ to 85 ℃ |

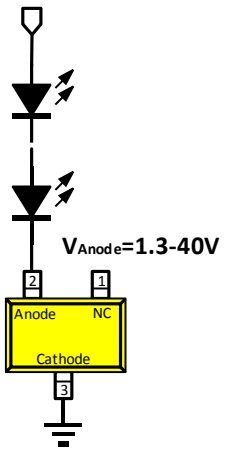
I: Industry, -40~85 ℃
03 : Pin Number
20 : 20mA
C: SOT-23
E: ROHS
30: 30mA

## Pin Configuration

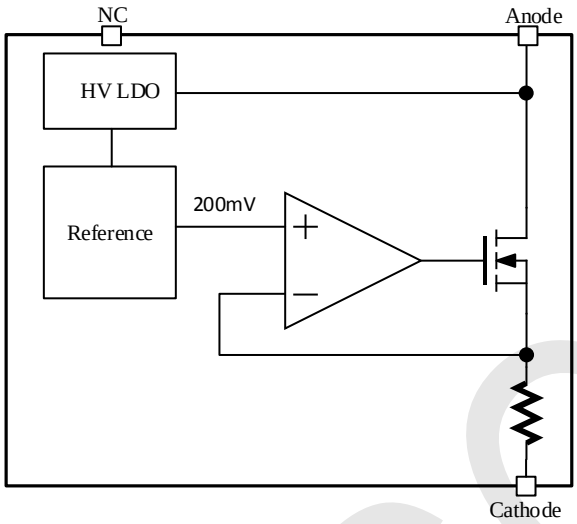
SOT-23




## Typical Application Circuit



## Block Diagram




## PIN Description

| PIN NO. | Name | Description |
|---|---|---|
| 1 | NC | No connection |
| 2 | Anode | Current input terminal |
| 3 | Cathode | Current flow out terminal |

## Absolute Maximum Ratings(Note1)

| Parameters | Maximum Ratings |
|---|---|
| Anode to Cathode | -0.3V to 44V |
| Operating temperature range | -40 ℃ to +85 ℃ |
| Junction temperature | -40 ℃ to +150 ℃ |
| Storage temperature range | -65 ℃ to +150 ℃ |
| ESD human body model | 2000V |

*Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. Electrical characteristics state DC and AC electrical specifications under particular test conditions which guarantee specific performance limits. This assumes that the device is within the Operating Ratings. Specifications are not guaranteed for parameters where no limit is given, however, the typical value is a good indication of device performance.*

## Electrical Characteristics

*Test Condition(Note2): VIN=5V, $T_A$=25 ℃ (unless otherwise specified)*

| Symbol | Parameter | Condition | SPEC | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| VIN | Input Voltage | | | | 40 | V |
| $V_{START\_UP}$ | Vin start up voltage | $I_{LED}$=85% * $I_{SET}$, $I_{SET}$=20mA | | 1.3 | 1.65 | V |
| $I_{ACCU}$ | LED current accuracy | | | ±5 | | % |
| $T_{SD}$ | over temperature protection threshold, the chip will shut down. | | | 160 | | ℃ |
| $T_{HYS}$ | Over temperature protection hysteresis | | | 30 | | ℃ |

*Note 2: Production testing of the device is performed at 25 ℃. Functional operation of the device and parameters specified over other temperature range, are guaranteed by design, characterization and process control.*

## Application Information

It is highly recommended to add a 0.1uF ceramic capacitor from Anode to Cathode to suppress high frequency noise.

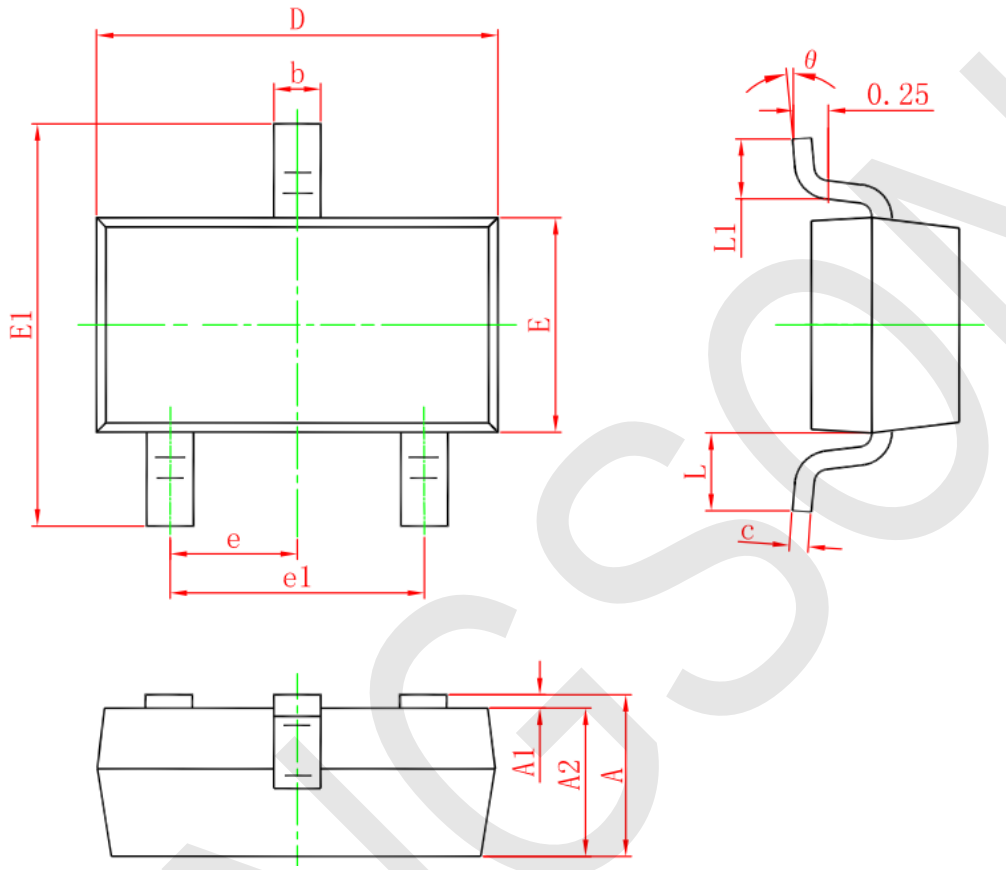
**Over-Heating Issue**

As the LED power supply rises, the LED cathode voltage will follow up, this will cause the chip overheating. The VAS1082 solve the issue by:

1) If the VAS1082 die temperature rises to 130℃, LED current will automatically reduce;

2) If the temperature continues to increase to 160℃, VAS1082 enter thermal shutdown mode. When the temperature dropped to 130℃, VAS1082 re-start to work.

## Package Information (SOT-23)




| SYMBOL | Dimension In Millimeters | | Dimension In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP. | | 0.037 TYP. | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF. | | 0.022 REF. | |
| L1 | 0.300 | 0.500 | 0.012 | 0.02 |
| θ | 0° | 8° | 0° | 8° |