

## Constant Voltage and Constant Current Controller

Rev. 00

### General Description

The LD8105 is built-in with a high-accuracy 1.2V voltage reference, two op-amps and a low-side current sensing circuit in a SOT-26 package. It provides a highly integrated solution for CV (constant voltage) and CC (constant current) dual control. The LD8105 is capable to operate under temperature ranging from -40°C to 105°C.

### Features

- Internal Precision  $\pm 1\%$  Voltage Reference
- Secondary-side Constant Voltage and Constant Current Control
- Low Quiescent consumption
- Wide VCC operating range 3V to 38V
- Max. 40V voltage rating
- Low external component count
- SOT-26 Package

### Applications

- LED Lighting

### Typical Application

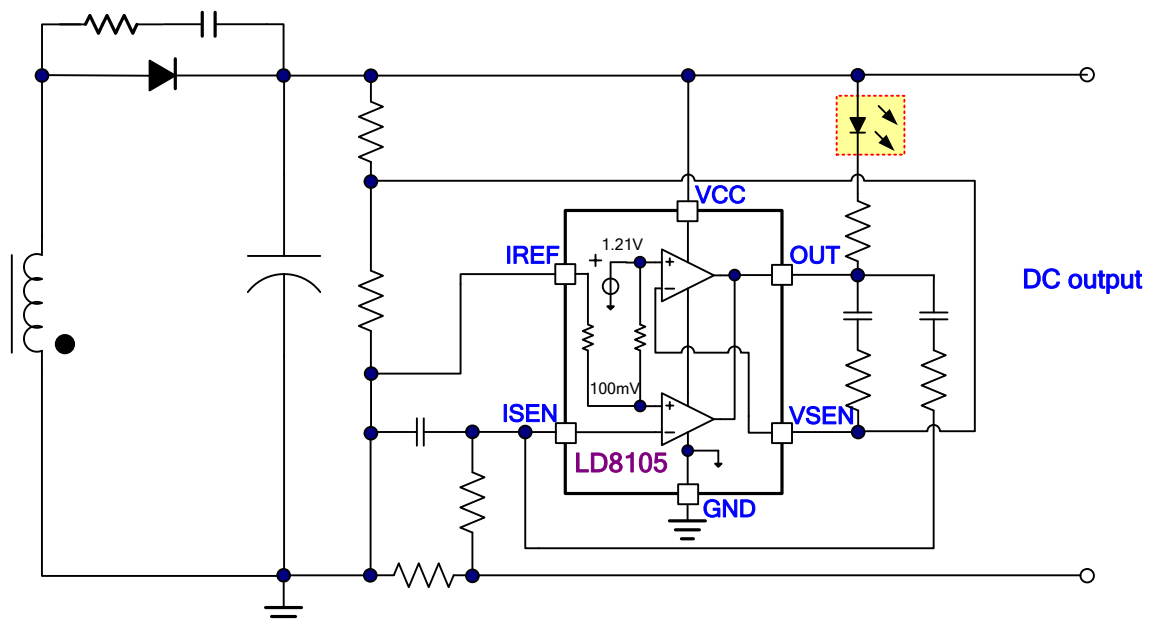


Fig. 1 Typical Application Circuit -1

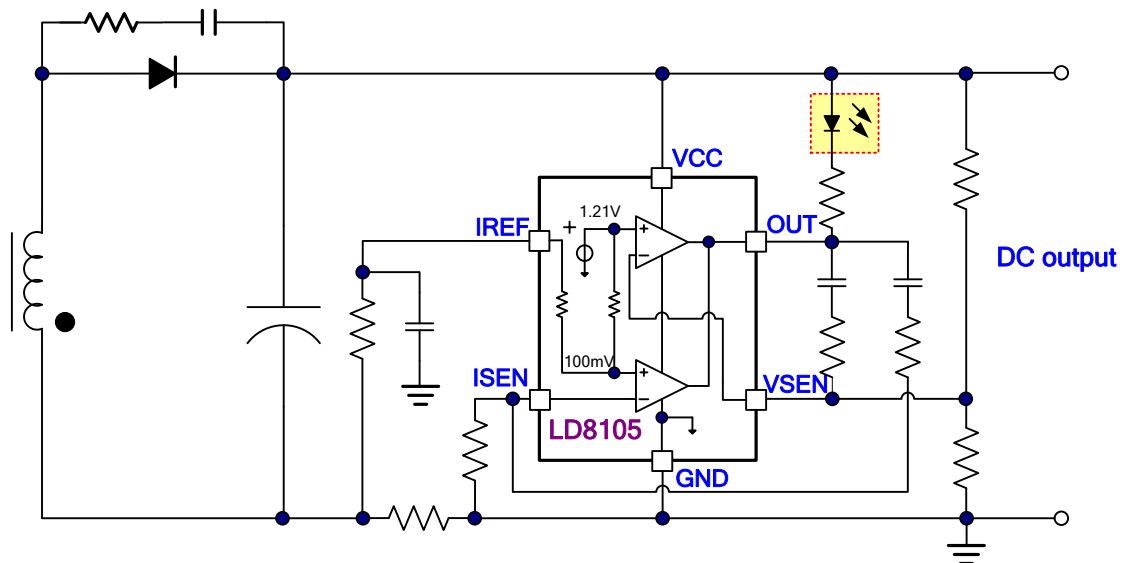
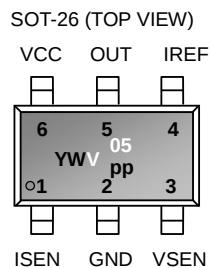


Fig. 2 Typical Application Circuit -2

## Pin Configuration



Y : Year code (D: 2004, E: 2005.....)  
W : Week code  
PP : Production code  
V05 : LD8105

## Ordering Information

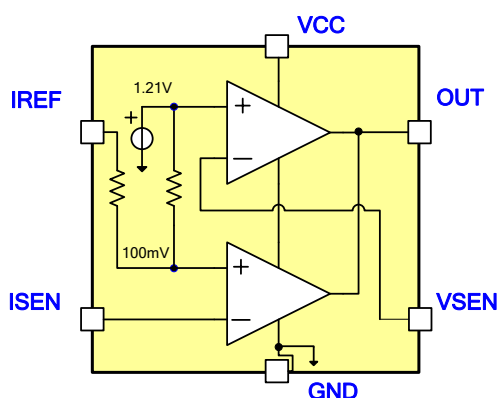
| Part number | Package | TOP MARK | Shipping          |
|-------------|---------|----------|-------------------|
| LD8105GL    | SOT-26  | YWV/05   | 3000 /tape & reel |

The LD8105 is Green Packaged.

## Pin Descriptions

| PIN | NAME | FUNCTION                                                                                                  |
|-----|------|-----------------------------------------------------------------------------------------------------------|
| 1   | ISEN | Current sense pin. The inverting input of the current loop op amp.                                        |
| 2   | GND  | Ground.                                                                                                   |
| 3   | VSEN | Voltage sense pin. It can sense the output voltage if connected to the mid-point of the resistor divider. |
| 4   | IREF | The non-inverting input of the current loop op amp.                                                       |
| 5   | OUT  | Common output pin of the two internal op amps.                                                            |
| 6   | VCC  | Supply voltage pin. It is necessary to locate a 0.1 $\mu$ F bypass capacitor between VCC and GND.         |

## Block Diagram



## Absolute Maximum Ratings

|                                                         |                |
|---------------------------------------------------------|----------------|
| Supply Voltage, Vcc .....                               | -0.3 ~40V      |
| VSEN .....                                              | -0.3~6V        |
| ISEN .....                                              | -0.3~6V        |
| IREF .....                                              | -0.6~6V        |
| OUT .....                                               | -0.3~Vcc       |
| Maximum sink current .....                              | 20mA           |
| Maximum Junction Temperature .....                      | 125°C          |
| Operating Junction Temperature .....                    | -40°C to 125°C |
| Operating Ambient Temperature .....                     | -40°C to 85°C  |
| Storage Temperature Range .....                         | -65°C to 150°C |
| Package Thermal Resistance .....                        | 250°C/W        |
| Power Dissipation (At Ambient Temperature = 85°C) ..... | 160mW          |
| Lead temperature (Soldering, 10sec) .....               | 260°C          |
| ESD Voltage Protection, Human Body Model .....          | 2 KV           |
| ESD Voltage Protection, Machine Model .....             | 200 V          |

### Caution:

Stresses beyond the ratings specified in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

## Recommended Operating Conditions

| Item               | Min. | Max. | Unit |
|--------------------|------|------|------|
| Supply Voltage Vcc | 3    | 38   | V    |

## Electrical Characteristics

( $T_A = +25^{\circ}\text{C}$  unless otherwise stated,  $V_{CC}=15.0\text{V}$ )

| PARAMETER                              | CONDITIONS                                                                                 | MIN   | TYP   | MAX   | UNITS         |
|----------------------------------------|--------------------------------------------------------------------------------------------|-------|-------|-------|---------------|
| <b>Supply Voltage (Vcc Pin)</b>        |                                                                                            |       |       |       |               |
| Supply Voltage                         |                                                                                            | 3     | --    | 38    | V             |
| Quiescent Current                      | $I_{SEN} = I_{REF} = 0\text{V}$ , OUT = open                                               | --    | --    | 150   | $\mu\text{A}$ |
| <b>Voltage Control Loop (VSEN PIN)</b> |                                                                                            |       |       |       |               |
| Voltage loop reference voltage, VSEN   | $I_{SEN} = I_{REF} = 0\text{V}$                                                            | 1.198 | 1.210 | 1.222 | V             |
|                                        | $I_{SEN} = I_{REF} = 0\text{V}$ , ( $T_A = -20^{\circ}\text{C} \sim 125^{\circ}\text{C}$ ) | 1.186 | --    | 1.234 | V             |
| Voltage Loop Input Bias Current        | $V_{SEN} = 1.18\text{V} \sim 1.24\text{V}$                                                 | --    | --    | 20    | nA            |
| <b>Current Control Loop (IREF Pin)</b> |                                                                                            |       |       |       |               |
| Current loop reference voltage, IREF   | $V_{SEN} = 1.21\text{V}$                                                                   | 97    | 100   | 103   | mV            |
| Current Loop Input Bias Current        | $I_{REF} = 90\text{mV} \sim 110\text{mV}$                                                  | --    | --    | 20    | nA            |
| <b>Output (Output Pin)</b>             |                                                                                            |       |       |       |               |
| Output Low Level                       | @2mA sink current                                                                          | --    | 200   | 400   | mV            |

## Typical Performance Characteristics

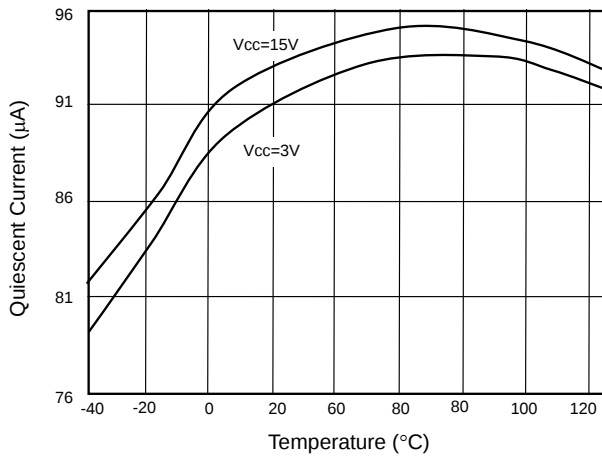


Fig. 1 Quiescent Current vs. Temperature

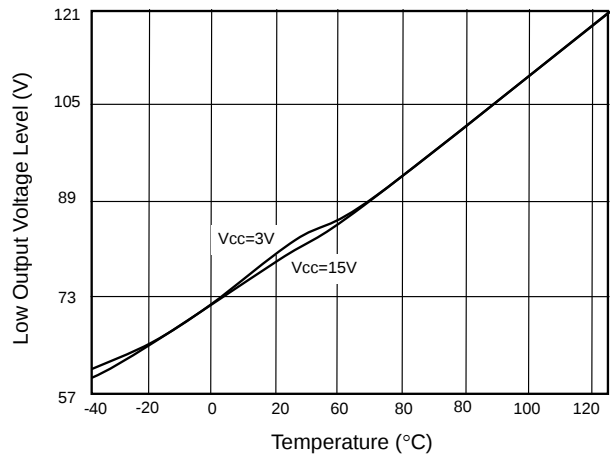


Fig. 2 Low Output Voltage Level vs. Temperature

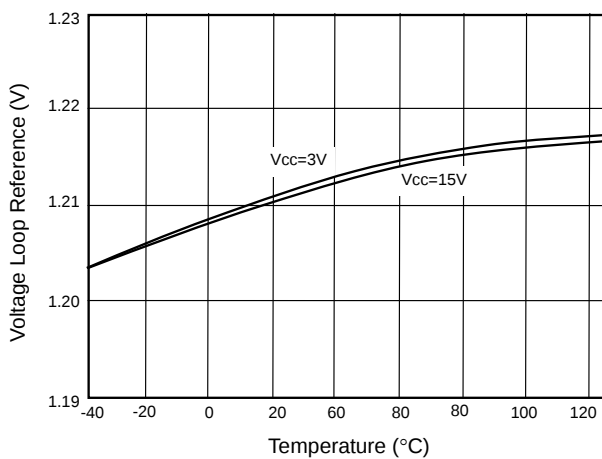


Fig. 3 Voltage Loop Reference vs. Temperature

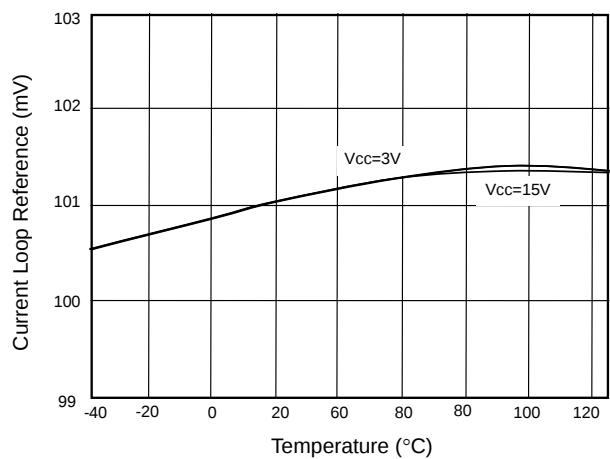
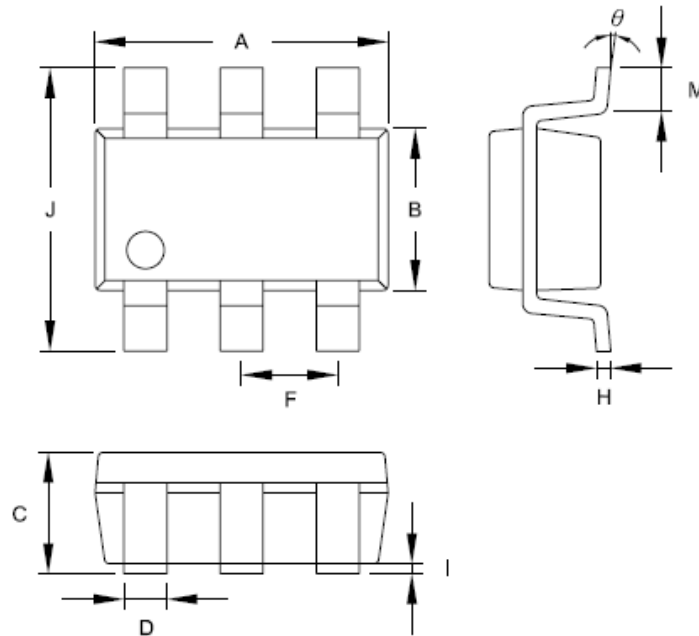


Fig. 4 Current Loop Reference vs. Temperature

## Package Information

SOT-26



| Symbol | Dimension in Millimeters |       | Dimensions in Inches |       |
|--------|--------------------------|-------|----------------------|-------|
|        | Min                      | Max   | Min                  | Max   |
| A      | 2.692                    | 3.099 | 0.106                | 0.122 |
| B      | 1.397                    | 1.803 | 0.055                | 0.071 |
| C      | -----                    | 1.450 | -----                | 0.057 |
| D      | 0.300                    | 0.500 | 0.012                | 0.020 |
| F      | 0.95 BSC.                |       |                      |       |
| H      | 0.080                    | 0.254 | 0.003                | 0.010 |
| I      | 0.050                    | 0.150 | 0.002                | 0.006 |
| J      | 2.600                    | 3.000 | 0.102                | 0.118 |
| M      | 0.300                    | 0.600 | 0.012                | 0.024 |
| θ      | 0°                       | 10°   | 0°                   | 10°   |

### Important Notice

Leadtrend Technology Corp. reserves the right to make changes or corrections to its products at any time without notice. Customers should verify the datasheets are current and complete before placing order.

**Revision History**

| Rev. | Date      | Change Notice          |
|------|-----------|------------------------|
| 00   | 5/29/2012 | Original Specification |