



# Bay Linear

Linear Excellence

## 7.5A Low Dropout Voltage Regulator

Adjustable

## B1083

Advance Information

### Description

The Bay Linear B1083 is Monolithic low power 7.5A Adjustable and fixed NPN voltage regulator that are easy to use with minimum external components. All internal circuitry is designed to operate down to 1V input to output differential and the dropout voltage is fully specified as a function of load current. Dropout is guaranteed at a maximum of 1.5V at a maximum output current. Current limit is trimmed, minimizing the stress on both the regulator and power source circuitry under overload conditions. It is suitable for applications requiring a well-regulated positive output voltage with low input-output differential voltage.

The B1083 Outstanding features include full power usage up to 7.5Amp of load current internal current limiting and thermal shutdown. A 10  $\mu$ F output capacitor is required on these new devices; however, this is usually included in most regulator design.

The B1083 is offered in a 3-pin TO-220, TO-263 packages compatible with other 3 terminal regulators. For 5A Low dropout Regulator refer to the BL1084 data sheet.

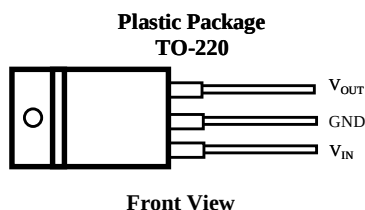
### Features

- Adjustable Output Down to 1.2V
- Output Current of 7.5A
- Low Dropout Voltage 1.0V Typ.
- 0.015% Line Regulation
- 0.01% Load Regulation
- Current & Thermal Limiting
- Standard 3-Terminal Low Cost TO-220
- Similar to industry Standard LT1083

### Applications

- Constant Current Regulators
- SMPS Post Regulator
- High Efficiency Linear Regulator
- High Efficiency Linear Power Supplies
- Battery Charger
- Adjustable Power Supplies

### Pin Connection



### Ordering Information

| Devices | Package | Temp.         |
|---------|---------|---------------|
| BL1084T | TO-220  | 0 °C to 70 °C |

**Absolute Maximum Rating**

| Parameter                                                                   | Symbol        | Value                | Unit |
|-----------------------------------------------------------------------------|---------------|----------------------|------|
| Maximum Input Voltage                                                       | $V_{IN}$      | 30                   | V    |
| Power Dissipation                                                           | $P_O$         | Internally Limited   | W    |
| Thermal Resistance Junction to Case                                         | $\theta_{JC}$ | 3                    | °C/W |
| Thermal Resistance Junction to Ambient                                      | $\theta_{JA}$ | 50                   |      |
| Operating Junction Temperature Range<br>Control Section<br>Power Transistor | $T_J$         | 0 to 125<br>0 to 150 | °C   |
| Storage Temperature Range                                                   | $T_{STG}$     | -65 to 150           |      |
| Lead Temperature (Soldering 10 Sec.)                                        | $T_{LEAD}$    | 300                  |      |

**Electrical Characteristics**(V<sub>IN</sub> = 4.75V to 5.25V; I<sub>O</sub> = 10mA to 3.0Amp, unless otherwise specified)

| Parameter              | Symbol                | Conditions                                                                                                                                                                                | MIN   | TYP                    | MAX                  | UNIT |
|------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------|----------------------|------|
| Reference Voltage      | $V_O$                 | I <sub>O</sub> = 10mA, T = 25 °C, V <sub>in</sub> -V <sub>out</sub> = 3V<br>10mA ≤ I <sub>OUT</sub> ≤ I <sub>FULL LOAD</sub><br>1.5V ≤ (V <sub>in</sub> -V <sub>out</sub> ) ≤ 25V (Note3) | 1.238 | 1.250                  | 1.262                | V    |
|                        |                       |                                                                                                                                                                                           | 1.225 |                        | 1.270                |      |
| Line Regulation (1)    | REG <sub>(line)</sub> | I <sub>LOAD</sub> = 10mA, 1.5V ≤ (V <sub>IN</sub> - V <sub>OUT</sub> ) ≤ 15V<br>T = 25 °C<br>15V ≤ (V <sub>in</sub> -V <sub>out</sub> ) ≤ 30V                                             |       | 0.015<br>0.035<br>0.05 | 0.20<br>0.20<br>0.50 | %    |
| Load Regulation (1)    | REG <sub>(LOAD)</sub> | (V <sub>in</sub> -V <sub>out</sub> ) = 3V<br>10mA ≤ I <sub>OUT</sub> ≤ I <sub>FULL LOAD</sub><br>T = 25 °C                                                                                |       | 0.1<br>0.2             | 0.30<br>0.40         |      |
| Dropout Voltage        | V <sub>D</sub>        | T = 25 °C<br>Over Temperature                                                                                                                                                             |       | 1.3                    | 1.5                  | V    |
| Current Limit          | I <sub>S</sub>        | (V <sub>in</sub> -V <sub>out</sub> ) = 5V<br>(V <sub>in</sub> -V <sub>out</sub> ) = 25V                                                                                                   |       | 8.0<br>0.4             | 9.5<br>1.0           | A    |
| Minimum Load Current   | I <sub>MIN LOAD</sub> | (V <sub>in</sub> -V <sub>out</sub> ) = 25V                                                                                                                                                |       | 10                     | 10                   | mA   |
| Temperature Regulation | T <sub>A</sub>        | T = 25 °C, 30ms pulse                                                                                                                                                                     |       | 0.002                  | 0.01                 | %/W  |
| Long Term Stability    | -                     | T = 25 °C, 1000Hrs                                                                                                                                                                        |       | 0.3                    | 1                    |      |
| Temperature Stability  | T <sub>S</sub>        |                                                                                                                                                                                           |       | 0.5                    |                      | %    |
| Adjust pin Current     | -                     | T = 25 °C<br>Over Temp.                                                                                                                                                                   |       | 55                     | 120                  | μA   |
| Ripple Rejection       | R <sub>A</sub>        | F = 120Hz, C <sub>ADJ</sub> = 25μF, C <sub>OUT</sub> = 25μF Tantalum<br>I <sub>OUT</sub> = I <sub>FULL LOAD</sub> , (V <sub>in</sub> -V <sub>out</sub> ) = 3V (Note 5)                    | 60    | 75                     |                      | dB   |
| Thermal Resistance     | -                     | TO-220 Junction to Tab                                                                                                                                                                    |       | 3.0                    | 3.0                  | °C/W |
|                        |                       | Junction to Ambient                                                                                                                                                                       |       | 60                     | 60                   |      |
|                        |                       | DD Package Junction to Tab                                                                                                                                                                |       | 3.0                    | 3.0                  |      |
|                        |                       | Junction to Ambient                                                                                                                                                                       |       | 60                     | 60                   |      |

**Note:** Output Switch tests are performed under pulsed conditions to minimize power dissipation

**Advance Information-** These data sheets contain descriptions of products that are in development. The specifications are based on the engineering calculations, computer simulations and/ or initial prototype evaluation.

**Preliminary Information-** These data sheets contain minimum and maximum specifications that are based on the initial device characterizations. These limits are subject to change upon the completion of the full characterization over the specified temperature and supply voltage ranges.

The application circuit examples are only to explain the representative applications of the devices and are not intended to guarantee any circuit design or permit any industrial property right to other rights to execute. Bay Linear takes no responsibility for any problems related to any industrial property right resulting from the use of the contents shown in the data book. Typical parameters can and do vary in different applications. Customer's technical experts must validate all operating parameters including "Typical" for each customer application.

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