

**DESCRIPTION**

The LX8941 is an adjustable, low dropout regulator rated for more than 1A of output current. It can regulate with as low as 0.8V headroom between the input and output voltages, at 1A output current, thus minimizing power dissipation. In addition, it can be used in applications where worst case supplies require a low input-output

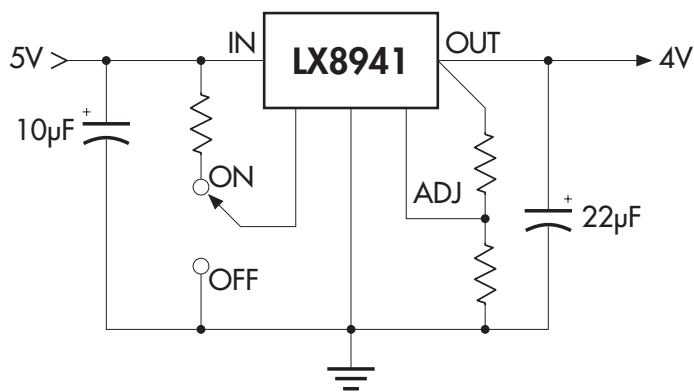
differential to maintain regulation. This feature makes it ideal for some processor applications that require 4V operation from a 5V supply. In addition, the LX8941 provides an on/off switch that reduces the IC quiescent current when activated, making it ideal for battery operated applications.

**KEY FEATURES**

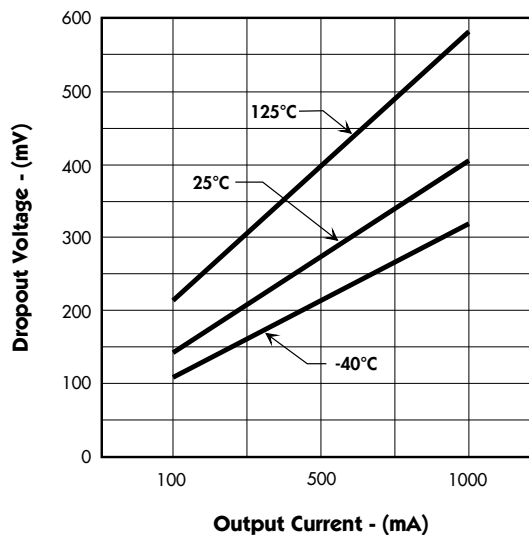
- 2% Internally Trimmed Output
- Output Current In Excess Of 1A
- Input-Output Differential Less Than 0.8V At 1A
- Reverse Battery Protection
- Short Circuit Protection
- Internal Thermal Overload Protection
- Available In 5-Lead Plastic TO-220 And Surface-Mount TO-263

**NOTE:** For current data & package dimensions, visit our web site: <http://www.linfinity.com>.

**PRODUCT HIGHLIGHT**



DROPOUT VOLTAGE VS. OUTPUT CURRENT VS. TEMPERATURE



**PACKAGE ORDER INFORMATION**

| T <sub>A</sub> (°C) | P                       | DD                      |
|---------------------|-------------------------|-------------------------|
| 0 to 70             | Plastic TO-220<br>5-pin | Plastic TO-263<br>5-pin |
|                     | <b>LX8941CP</b>         | <b>LX8941CDD</b>        |

Note: All surface-mount packages are available in Tape & Reel. Append the letter "T" to part number. (i.e. LX8941CDDT)

# LX8941

## ADJUSTABLE LOW DROPOUT REGULATOR

### PRELIMINARY DATA SHEET

#### ABSOLUTE MAXIMUM RATINGS (Note 1)

|  |                |
|--|----------------|
| Input Voltage ( $V_{IN}$ ) .....               | 26V            |
| Operating Junction Temperature                 |                |
| Plastic (P, DD Package) .....                  | 150°C          |
| Storage Temperature Range .....                | -65°C to 150°C |
| Lead Temperature (Soldering, 10 seconds) ..... | 300°C          |

Note 1. Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.

#### THERMAL DATA

##### P PACKAGE:

|   |         |
|---|---------|
| THERMAL RESISTANCE-JUNCTION TO TAB, $\theta_{JT}$     | 4.5°C/W |
| THERMAL RESISTANCE-JUNCTION TO AMBIENT, $\theta_{JA}$ | 60°C/W  |

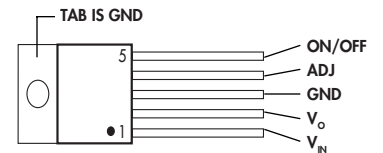
##### DD PACKAGE:

|   |         |
|---|---------|
| THERMAL RESISTANCE-JUNCTION TO TAB, $\theta_{JT}$     | 4.5°C/W |
| THERMAL RESISTANCE-JUNCTION TO AMBIENT, $\theta_{JA}$ | 60°C/W  |

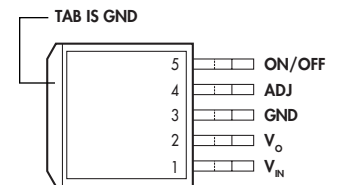
Junction Temperature Calculation:  $T_J = T_A + (P_D \times \theta_{JA})$ .

The  $\theta_{JA}$  numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

#### PACKAGE PIN OUTS

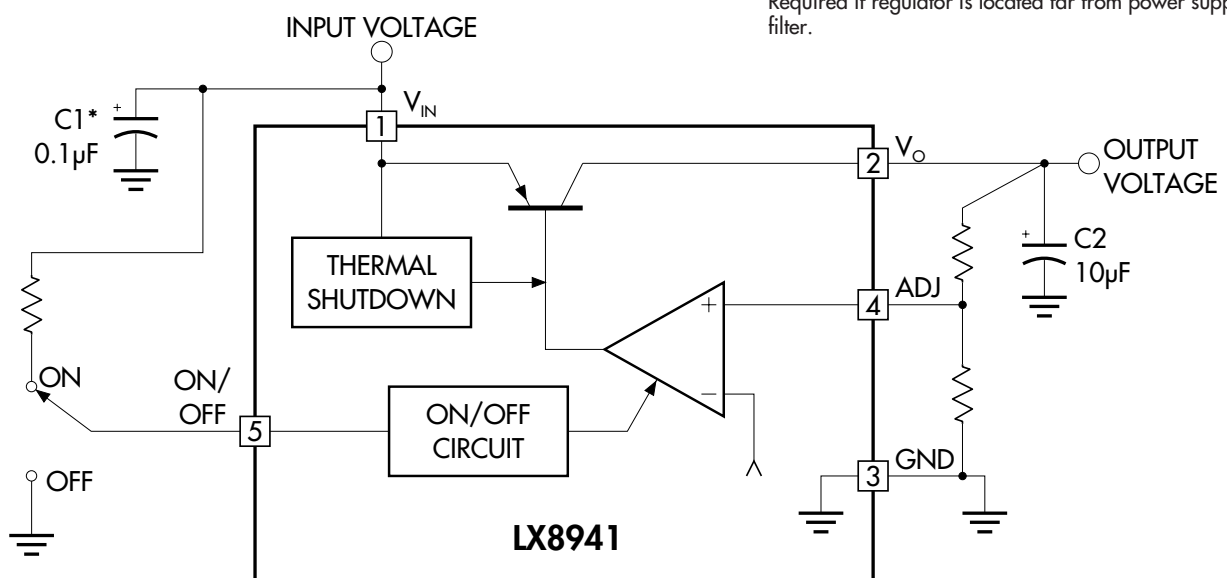


**P PACKAGE**  
(Top View)



**DD PACKAGE**  
(Top View)

#### BLOCK DIAGRAM



\* Required if regulator is located far from power supply filter.

## ADJUSTABLE LOW DROPOUT REGULATOR

## PRELIMINARY DATA SHEET

## RECOMMENDED OPERATING CONDITIONS

| Parameter   | Symbol   | Recommended Operating Conditions |      |      | Units   |
|---|----------|----------------------------------|------|------|---------|
|   |          | Min.                             | Typ. | Max. |         |
| Input Voltage (Note 2)  | $V_{IN}$ | 3.8                              |      | 26   | V       |
| Load Current (with adequate heatsinking)                          |          | 5                                |      | 1000 | mA      |
| Input Capacitor ( $V_{IN}$ to GND)                                |          | 0.1                              |      |      | $\mu$ F |
| Output Capacitor with ESR of $10\Omega$ max., ( $V_{OUT}$ to GND) |          | 10                               |      |      | $\mu$ F |

Note 2.  $V_{IN(MIN)} = V_{OUT} + 1.2\Delta V_{(MAX)}$ . See Dropout Voltage maximum limit.

## ELECTRICAL CHARACTERISTICS

Unless otherwise specified, these specifications apply over the operating ambient temperature of  $0^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  for LX8941CP;  $V_{IN} = 10\text{V}$ ,  $I_O = 1\text{A}$ ,  $C_{OUT} = 22\mu\text{F}$ , and are for DC characteristics only. (Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

| Parameter                     | Symbol          | Test Conditions  | LX8941 |      |       | Units                  |
|-------------------------------|-----------------|--|--------|------|-------|------------------------|
|                               |                 |  | Min.   | Typ. | Max.  |                        |
| ADJ Pin Voltage               | $V_O$           | $I_O = 0\text{A}$ , $T_A = 25^{\circ}\text{C}$                     | 1.225  | 1.25 | 1.275 | V                      |
| Line Regulation               | $\Delta V_{OL}$ | $V_O + 2\text{V} \leq V_{IN} \leq 26\text{V}$ , $I_O = 5\text{mA}$ |        | 1    | 50    | mV                     |
| Load Regulation               | $\Delta V_{OL}$ | $50\text{mA} \leq I_O \leq 1\text{A}$ , $V_O = V_{ADJ}$            |        | 10   | 50    | mV                     |
| Dropout Voltage               | $\Delta V$      | $I_O = 100\text{mA}$   |        | 150  | 300   | mV                     |
|                               |                 | $I_O = 500\text{mA}$   |        | 275  | 500   | mV                     |
|                               |                 | $I_O = 1\text{A}$  |        | 400  | 800   | mV                     |
| Quiescent Current             | $I_Q$           | $I_O \leq 5\text{mA}$ , $7 \leq V_{IN} \leq 26\text{V}$            |        | 3    | 15    | mA                     |
|                               |                 | $I_O = 500\text{mA}$   |        | 30   | 50    | mA                     |
|                               |                 | $I_O = 1000\text{mA}$  |        | 115  | 180   | mA                     |
| Adjust Pin Current            | $I_{ADJ}$       | $V_{IN} = 10\text{V}$ , $I_O = 1\text{A}$                          |        | 2    | 20    | $\mu$ A                |
| Current Limit                 | $I_{CL}$        | $V_{IN} = 26\text{V}$  | 1      | 1.2  |       | A                      |
| Output Noise Voltage (Note 3) | $V_{O_{RMS}}$   | 10Hz - 100kHz, $I_O = 5\text{mA}$                                  |        | 150  |       | $\mu$ V <sub>RMS</sub> |
| Long Term Stability (Note 3)  |                 |  |        | 20   |       | mV/1000hr              |
| Ripple Rejection (Note 3)     | $R_R$           | $f_O = 120\text{Hz}$ , $1V_{RMS}$ , $I_O = 100\text{mA}$           |        | 66   |       | dB                     |

## Enable Logic Section

|                       |  |  |     |  |     |         |
|-----------------------|--|--|-----|--|-----|---------|
| On Threshold Voltage  |  |  | 2   |  |     | V       |
| On Threshold Current  |  |  |     |  | 50  | $\mu$ A |
| Off Threshold Voltage |  |  |     |  | 0.8 | V       |
| Off Threshold Current |  |  | -10 |  |     | $\mu$ A |

Note 3. These parameters, although guaranteed, are not tested in production.

PRELIMINARY DATA - Information contained in this document is pre-production data, and is proprietary to Linfinity. It may not be modified in any way without the express written consent of Linfinity. Product referred to herein is offered in sample form only, and Linfinity reserves the right to change or discontinue this proposed product at any time.