



# SPX2930

## 150 mA Low Dropout Voltage Regulator

### FEATURES

- Output Current in Excess of 150mA
- 3V, 3.3V, 3.5V, 4.0V, 4.5V & 5.0V Versions Available
- Very Low Quiescent Current
- Input-Output Differential Less than 0.6V
- 60V Load Dump Protection
- -50V Reverse Transient Protection
- Internal Thermal Overload Protection
- Reverse Battery Protection
- Short Circuit Protection
- Available in TO-220, TO-92, SO-8, SOT-89 Packages
- Similar to Industry Standard LM2930

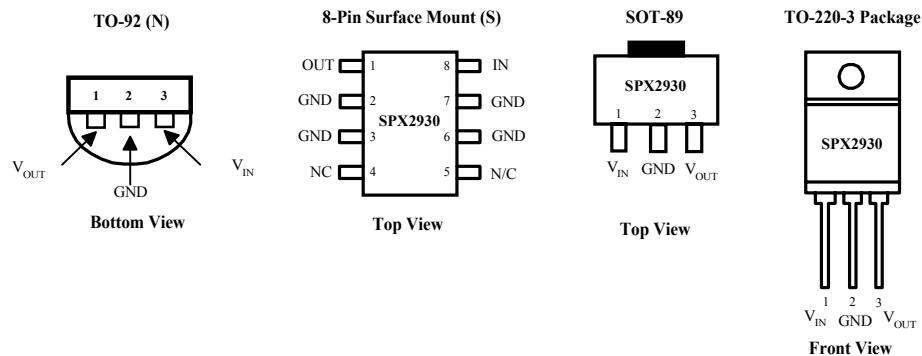
### APPLICATIONS

- Cordless Telephones
- Portable Consumer Equipment
- Portable Instrumentation
- Radio Control Systems

### PRODUCT DESCRIPTION

The SPX2930 is a positive Low Power Voltage Regulator. This device is an excellent choice for use in battery-powered applications, such as cordless telephones, radio control systems, and automotive applications. The SPX2930 was originally designed for automotive applications, all circuitry is protected from reverse battery installations. During line transients, such as a load dump (+60V) when the input voltage to the regulator exceed its maximum operating voltage, this device will automatically shut down to protect both internal circuits as well as the load. The SPX2930 is offered as a 3.0V, 3.3V, 3.5V, 4.5V, 5.0V fixed output in 3-pin SOT-89, TO-92/TO-220 packages compatible with other 5V regulators. The SPX2930 is also offered in 5V SO-8 package.

### PIN CONNECTIONS



## ABSOLUTE MAXIMUM RATINGS

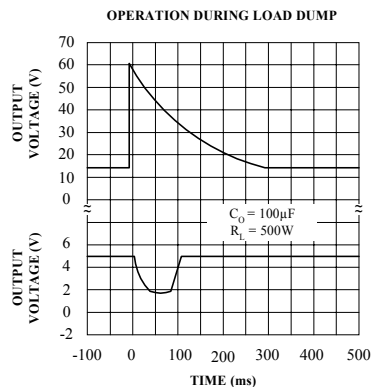
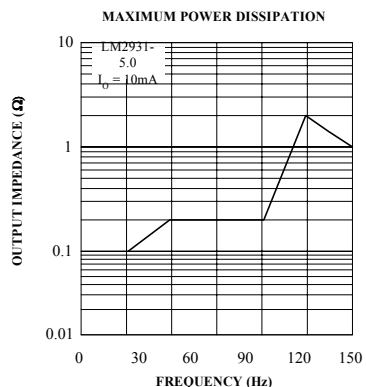
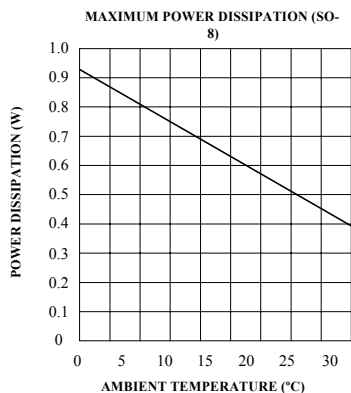
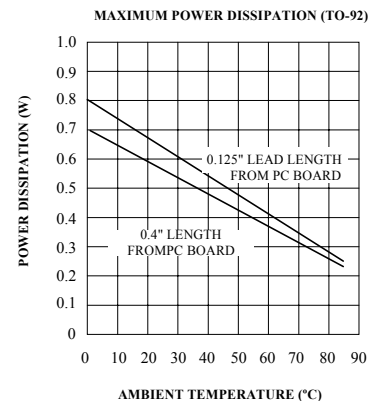
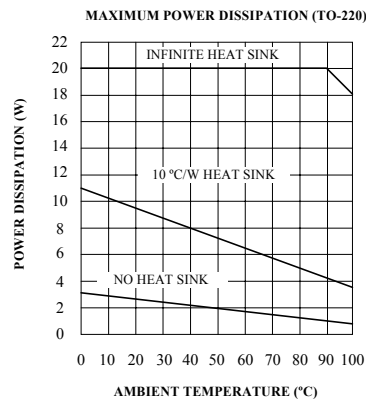
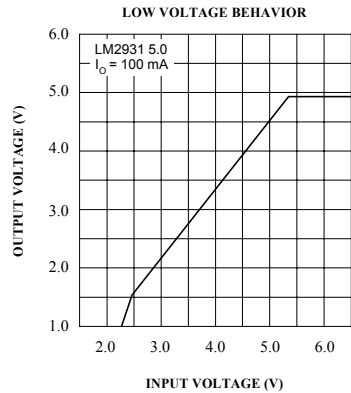
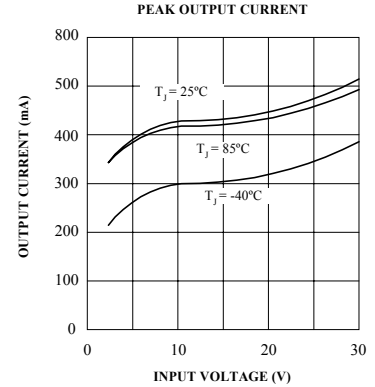
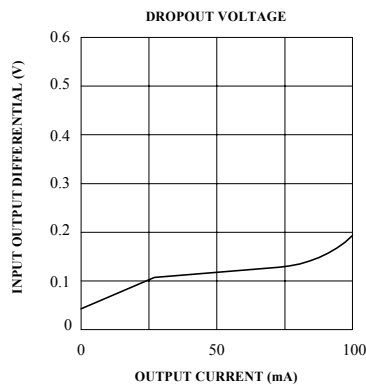
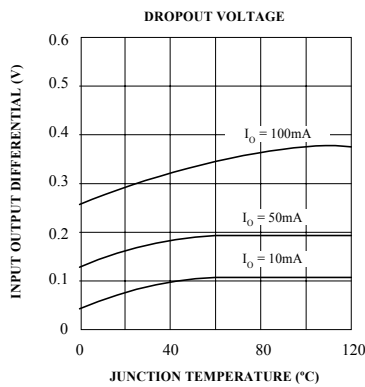
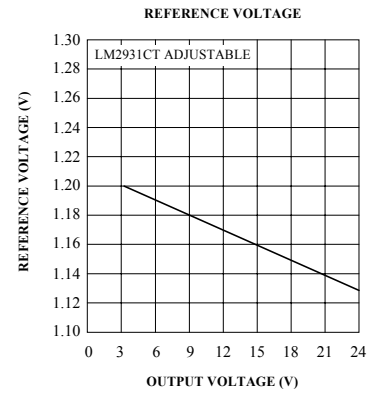
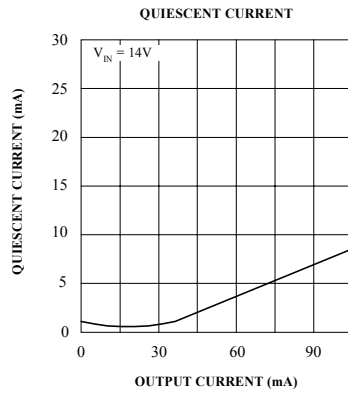
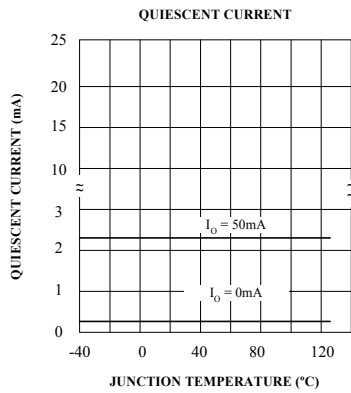
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|--------------------------------------------|--------------------|
| Power Dissipation.....                     | Internally Limited |
| Lead Temp. (soldering, 10 Seconds).....    | 230°C              |
| Storage Temperature Range                  | -65° to +150°C     |
| Operating Junction Temperature Range ..... | -40° to +85°C      |
| Maximum Junction Temperature .....         | +125°C             |
| ESD Rating.....                            | 2KV                |

|                              |              |
|------------------------------|--------------|
| Over Voltage Protection..... | 60V          |
| Reverse Voltage (100mS)..... | -50V         |
| Reverse Voltage(DC).....     | -15V         |
| Input Supply Voltage .....   | -0.3 to +26V |

## ELECTRICAL CHARACTERISTICS at $V_s=14V$ , $T_a=25^\circ C$ , $I_o=150mA$ , $C_2=100\mu F$ , unless otherwise specified.

| Parameter                                 | Conditions                                                                                                                     | SPX2930 |             |               |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------|-------------|---------------|
|                                           |                                                                                                                                | Typ     | Max         | Units         |
| <b>3.0 Volt Version</b>                   |                                                                                                                                |         |             |               |
| <b>SPX2930-3.0</b>                        |                                                                                                                                |         |             |               |
| Output Voltage                            | $6V < V_{in} < 26V$ ,<br>$I_o = 150mA$ Over Temp.                                                                              | 3.00    | 3.09        | V             |
|                                           |                                                                                                                                | 3.00    | <b>3.15</b> | V             |
| <b>3.3 Volt Version</b>                   |                                                                                                                                |         |             |               |
| <b>SPX2930-3.3</b>                        |                                                                                                                                |         |             |               |
| Output Voltage                            | $6V < V_{in} < 26V$ ,<br>$I_o = 150mA$ Over Temp.                                                                              | 3.30    | 3.39        | V             |
|                                           |                                                                                                                                | 3.30    | <b>3.43</b> | V             |
| <b>4.0 Volt Version</b>                   |                                                                                                                                |         |             |               |
| <b>SPX2930-4.0</b>                        |                                                                                                                                |         |             |               |
| Output Voltage                            | $6V < V_{in} < 26V$ ,<br>$I_o = 150mA$ Over Temp.                                                                              | 4.0     | 4.1         | V             |
|                                           |                                                                                                                                | 4.0     | <b>4.14</b> | V             |
| <b>5 Volt Version</b>                     |                                                                                                                                |         |             |               |
| <b>SPX2930-5.0</b>                        |                                                                                                                                |         |             |               |
| Output Voltage                            | $6V < V_{in} < 26V$ ,<br>$I_o = 150mA$ Over Temp.                                                                              | 5.00    | 5.25        | V             |
|                                           |                                                                                                                                |         | <b>5.5</b>  | V             |
| Long Term Stability                       |                                                                                                                                | 20      |             | mV/1000       |
| Line Regulation                           | $9V < V_{in} < 16V$<br>$6V < V_{in} < 26V$                                                                                     | 4.0     | 30          | mV            |
| Load Regulation                           | $5mA < I_o < 150mA$                                                                                                            | 14      | 50          | mV            |
| Dropout Voltage                           | $I_o = 10mA$<br>$I_o = 50mA$<br>$I_o = 150mA$                                                                                  | 0.05    | 0.2         | V             |
|                                           |                                                                                                                                | 0.07    | 0.1         | V             |
|                                           |                                                                                                                                | 0.3     | 0.6         | V             |
| Quiescent Current                         | $I_o < 10mA$ , $6V < V_{in} < 26V$<br>$-40^\circ C < T_j < 125^\circ C$<br>$I_o = 150mA$ , $V_{in} = 14V$ , $T_j = 25^\circ C$ | 0.4     | 1.0         | mA            |
|                                           |                                                                                                                                | 15      |             | mA            |
| Maximum Operational Input Voltage         |                                                                                                                                | 33      |             | V             |
| Maximum Line Transient                    | $R_L = 500\Omega$ , $V_o < 5.5V$ , 100ms                                                                                       | 50      |             | V             |
| Reverse Polarity Input Voltage, DC        | $V_o > -0.3V$ , $R_L = 500\Omega$                                                                                              | 30      |             | V             |
| Reverse Polarity Input Voltage, Transient | 1% Duty Cycle, $\tau < 100ms$ ,<br>$R_L = 500\Omega$                                                                           | -80     |             | V             |
| Current Limit                             |                                                                                                                                | 400     | 450         | mA            |
| Output Noise Voltage                      | 10Hz-100kHz, $C_{out} = 100\mu F$                                                                                              | 500     |             | $\mu V_{rms}$ |
| Ripple Rejection                          | $f_o = 120Hz$                                                                                                                  | 80      |             | dB            |

## TYPICAL CHARACTERISTICS



## ORDERING INFORMATION

| Ordering No.  | Output Voltages | Packages      |
|---------------|-----------------|---------------|
| SPX2930N-3.0  | 3.0V            | 3 Lead TO-92  |
| SPX2930N-3.3  | 3.3V            | 3 Lead TO-92  |
| SPX2930N-3.5  | 3.5V            | 3 Lead TO-92  |
| SPX2930N-4.0  | 4.0V            | 3 Lead TO-92  |
| SPX2930N-4.5  | 4.5V            | 3 Lead TO-92  |
| SPX2930N-5.0  | 5.0V            | 3 Lead TO-92  |
| SPX2930S-3.0  | 3.0V            | 8 Lead SOIC   |
| SPX2930S-3.3  | 3.3V            | 8 Lead SOIC   |
| SPX2930S-3.5  | 3.5V            | 8 Lead SOIC   |
| SPX2930S-4.0  | 4.0V            | 8 Lead SOIC   |
| SPX2930S-4.5  | 4.5V            | 8 Lead SOIC   |
| SPX2930S-5.0  | 5.0V            | 8 Lead SOIC   |
| SPX2930M1-3.0 | 3.0V            | 3 Lead SOT-89 |
| SPX2930M1-3.3 | 3.3V            | 3 Lead SOT-89 |
| SPX2930M1-3.5 | 3.5V            | 3 Lead SOT-89 |
| SPX2930M1-4.0 | 4.0V            | 3 Lead SOT-89 |
| SPX2930M1-4.5 | 4.5V            | 3 Lead SOT-89 |
| SPX2930M1-5.0 | 5.0V            | 3 Lead SOT-89 |
| SPX2930U-3.0  | 3.0V            | 3 Lead TO-220 |
| SPX2930U-3.3  | 3.3V            | 3 Lead TO-220 |
| SPX2930U-3.5  | 3.5V            | 3 Lead TO-220 |
| SPX2930U-4.0  | 4.0V            | 3 Lead TO-220 |
| SPX2930U-4.5  | 4.5V            | 3 Lead TO-220 |
| SPX2930U-5.0  | 5.0V            | 3 Lead TO-220 |



SIGNAL PROCESSING EXCELLENCE

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