# SPX29150/51/52/53

Data Sheet

1.5A Low Dropout Voltage Regulator

## General Description

The SPX29150/51/52/53 are 1.5A, highly accurate voltage regulators with a low dropout voltage of 390mV (typical) at 1.5A. These regulators are specifically designed for low-voltage applications that require a low-dropout voltage and a fast transient response. They are fully fault-protected against overcurrent, reverse battery, and positive and negative voltage transients. On-chip trimming adjusts the reference voltage to an initial accuracy of 1%. Other features in the 5-pin versions include Enable and Error Flag.

The SPX29150/51/52/53 is offered in a 5-pin TO-263 package. For a 3A version, refer to the *SPX29300/SPX29301/SPX29302 Data Sheet* (256DS).

***TO-263-5 version available, TO-263-3 and TO-220 versions obsolete***

## Features

- Adjustable output down to 1.25V
- 1% output accuracy
- Output current of 1.5A
- Low dropout voltage of 390mV at 1.5A
- Extremely tight load and line regulation
- Extremely fast transient response
- Reverse-battery protection
- Zero current shutdown (5-pin version)
- Error Flag signal output for out of regulation state (5-pin version)
- Standard TO-263-5 package

## Applications

- Industrial equipment
- Telecommunications equipment
- LCD monitors
- USB power supplies
- SMPS post-regulation
- High-efficiency linear power supplies
- Portable instrumentation
- Constant current regulators
- Battery chargers

## Typical Applications Circuits

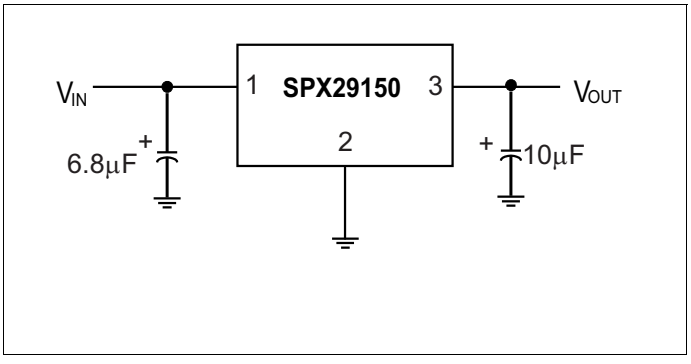


**Figure 1: Fixed Output Linear Regulator**

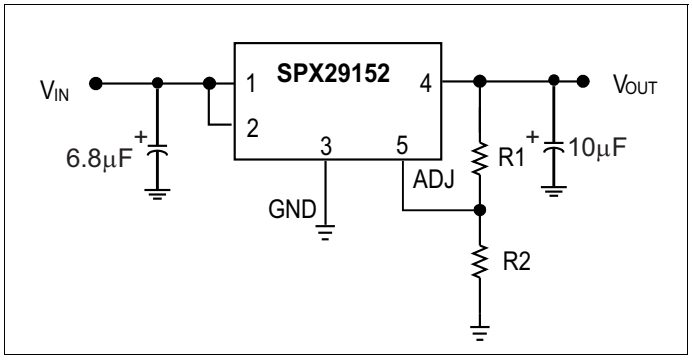


**Figure 2: Adjustable Output Linear Regulator**

# Revision History

| Revision | Release Date | Change Description |
|---|---|---|
| 248DSR00 | June 20, 2023 | **Updated:**<br>■ New template applied, contents rewriting, and obsolete packages highlighted.<br>■ "General Description" section.<br>■ "Features" section.<br>■ "Applications" section.<br>■ "Specifications" section.<br>■ "Pin Configuration" section.<br>■ "Output Voltage vs Temperature" figure caption.<br>■ "Ground Current vs Temperature in Dropout" figure caption.<br>■ "Mechanical Dimensions—3-Pin and 5-Pin TO-263" figure.<br>■ "Mechanical Dimensions—3-Pin and 5-Pin TO-220" figure.<br>**Added:**<br>■ "Pin Description" section.<br>■ "Ordering Information" section. |
| Rev B | June 5, 2008 | Legacy Exar data sheet. |

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# Specifications

## Absolute Maximum Ratings

**Important:** The stresses above what is listed under the following table may cause permanent damage to the device. This is a stress rating only—functional operation of the device above what is listed under the following table or any other conditions beyond what MaxLinear recommends is not implied. Exposure to conditions above the recommended extended periods of time may affect device reliability. Solder reflow profile is specified in the *IPC/JEDEC J-STD-020C* standard.

**Table 1: Absolute Maximum Ratings**

| Parameter | Min | Max | Units |
|---|---|---|---|
| Storage Temperature Range | –65 | 150 | °C |
| Operating Junction Temperature Range | –40 | 125 | °C |
| Input Voltage (1) | - | 16 | V |

1. Maximum positive supply voltage of 20V must be of limited duration (<100msec) < (1%). The maximum continuous supply voltage is 16V.

## Thermal Specifications

***TO-263-5 version available, TO-263-3 and TO-220 versions obsolete***

**Table 2: Thermal Performance**

| Symbol | Parameter | Package | Typ | Units |
|---|---|---|---|---|
| $\Psi_{JB}$ | Junction to Case, at Tab | TO-220 | 3 | ºC/W |
| $\theta_{JA}$ | Junction to Ambient | TO-220 | 30 | ºC/W |
| $\Psi_{JB}$ | Junction to Case, at Tab | TO-263 | 3 | ºC/W |
| $\theta_{JA}$ | Junction to Ambient | TO-263 | 32 | ºC/W |

# Electrical Characteristics

Electrical characteristics at $V_{IN} = V_{OUT} + 1V$ and $I_{OUT} = 10mA$, $C_{IN} = 6.8\mu F$, $C_{OUT} = 10\mu F$, $T_A = 25°C$, unless otherwise specified. The • denotes the specifications that apply over the full temperature range of –40°C to 125°C, unless otherwise specified. Adjustable versions are set to 5.0V.

**Table 3: Electrical Characteristics**

| Parameter | Conditions | | SPX29150/51 | | | Units |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| **1.8V Version** | | | | | | |
| Output Voltage | $I_{OUT}$ = 10mA | | 1.782 | 1.8 | 1.818 | V |
| | 10mA ≤ $I_{OUT}$ ≤ 1.5A, 2.5V ≤ $V_{IN}$ ≤ 16V | • | 1.764 | 1.8 | 1.836 | |
| **2.5V Version** | | | | | | |
| Output Voltage | $I_{OUT}$ = 10mA | | 2.475 | 2.5 | 2.525 | V |
| | 10mA ≤ $I_{OUT}$ ≤ 1.5A, 3.5V ≤ $V_{IN}$ ≤ 16V | • | 2.450 | 2.5 | 2.550 | |
| **3.3V Version** | | | | | | |
| Output Voltage | $I_{OUT}$ = 10mA | | 3.267 | 3.3 | 3.333 | V |
| | 10mA ≤ $I_{OUT}$ ≤ 1.5A, 4.3V ≤ $V_{IN}$ ≤ 16V | • | 3.234 | 3.3 | 3.366 | |
| **5.0V Version** | | | | | | |
| Output Voltage | $I_{OUT}$ = 10mA | | 4.950 | 5.0 | 5.050 | V |
| | 10mA ≤ $I_{OUT}$ ≤ 1.5A, 6.0V ≤ $V_{IN}$ ≤ 16V | • | 4.900 | 5.0 | 5.100 | |
| **All Voltage Options SPX29150/51/52/53** | | | | | | |
| Line Regulation | $I_{OUT}$ = 10mA, ($V_{OUT}$ + 1V) ≤ $V_{IN}$ ≤ 16V | | - | 0.1 | 0.5 | % |
| Load Regulation | $V_{IN} = V_{OUT} + 1V$, 10mA ≤ $I_{OUT}$ ≤ $I_{FULL-LOAD}$ | | - | 0.2 | 1 | % |
| ΔV/ΔT | Output voltage temperature coefficient | • | - | 13 | 100 | ppm/°C |
| Dropout Voltage (1) (except 1.8V version) | $I_{OUT}$ = 100mA | • | - | 70 | 200 | mV |
| | $I_{OUT}$ = 750mA | | - | 230 | - | |
| | $I_{OUT}$ = 1.5A | • | - | 390 | 600 | |
| Ground Current (2) | $I_{OUT}$ = 750mA | • | - | 12 | 25 | mA |
| | $I_{OUT}$ = 1.5A | | - | 45 | - | |
| $I_{GNDDO}$ Ground Pin Current at Dropout | $V_{IN}$ = 0.1V less than specified $V_{OUT}$, $I_{OUT}$ = 10mA | | - | 0.9 | - | mA |
| Current Limit | $V_{OUT}$ = 0.0V (3) | | 1.7 | 2.2 | - | A |
| Output Noise Voltage (10Hz to 100kHz) $I_L$ = 100mA | $C_L = 10\mu F$ | | - | 400 | - | $\mu V_{RMS}$ |
| | $C_L = 33\mu F$ | | - | 260 | - | |
| Reference Voltage | Adjustable version only | | 1.228 | 1.240 | 1.252 | V |
| | | • | 1.215 | 1.240 | 1.265 | |
| Reference Voltage | Adjustable version only. $V_{REF} \le V_{OUT} \le (V_{IN} - 1V)$, 2.5V ≤ $V_{IN}$ ≤ 16V, 10mA ≤ $I_L$ ≤ $I_{FL}$, $T_J < T_{JMAX}$ | | 1.203 | - | 1.277 | V |
| Adjust Pin Bias Current | - | | - | 40 | 80 | nA |
| | | • | - | 40 | 120 | |
| Reference Voltage Temperature Coefficient | (4) | | - | 13 | - | ppm/°C |

**Table 3: Electrical Characteristics (Continued)**

| Parameter | | Conditions | | SPX29150/51 | | | Units |
|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | |
| Adjust Pin Bias Current Temperature Coefficient | | - | | - | 0.1 | - | nA/°C |
| **Flag Output (Error Comparator) SPX29151/53** | | | | | | | |
| Output Leakage Current | | $V_{OH}$ = 16V | | - | 0.1 | 1 | µA |
| | | | • | - | 0.1 | 2 | |
| Output Low Voltage | | Device set for 5V, $V_{IN}$ = 4.5V, $I_{OL}$ = 250µA | | - | 200 | 300 | mV |
| | | | • | - | 200 | 400 | |
| Upper Threshold Voltage | | Device set for 5V (5) | | 40 | 60 | - | mV |
| | | | • | 25 | 60 | - | |
| Lower Threshold Voltage | | Device set for 5V (5) | | - | 75 | 95 | mV |
| | | | • | - | 75 | 140 | |
| Hysteresis | | Device set for 5V (5) | | - | 15 | - | mV |
| **ENABLE Input SPX29151/52** | | | | | | | |
| Input Logic Voltage | Low (OFF) | $V_{IN}$ < 10V | • | - | - | 0.8 | V |
| | High (ON) | | • | 2.4 | - | - | |
| Enable Input Pin Input Current | | $V_{EN}$ = 16V | | - | 100 | 600 | µA |
| | | | • | - | 100 | 750 | |
| | | $V_{EN}$ = 0.8V | | - | - | 1 | |
| | | | • | - | - | 2 | |
| Regulator Output Current in Shutdown | | (6) | • | - | 10 | 500 | µA |

1. Dropout voltage is defined as the input-to-output differential when the output voltage drops to 99% of its nominal value.

2. The ground pin current is the regulator quiescent current. The total current drawn from the source is the sum of the load current to the ground current.

3. $V_{IN}$ = $V_{OUT}$ (NOMINAL) + 1V. For example, use $V_{IN}$ = 4.3V for a 3.3V regulator. Employ pulse-testing procedures to minimize temperature rise.

4. Thermal regulation is defined as the change in the output voltage at a time T after a change in power dissipation is applied, excluding load or line regulation effects.

5. The comparator threshold is expressed in terms of a voltage differential at the Adjust terminal below the nominal reference voltage measured 6V input. To express these thresholds in terms of output voltage change, multiply the error amplifier gain = $V_{OUT}/V_{REF}$ = (R1 + R2)/R2. For example, at a programmable output voltage of 5V, the Error output is guaranteed to go low when the output drops by 95mVx 5V/1.240V = 38mV. Thresholds remain constant as a percentage of $V_{OUT}$ as $V_{OUT}$ is varied, with the dropout warning typically occurring at 5% below nominal, 7.7% guaranteed.

6. $V_{EN}$ ≤ 0.8V and $V_{IN}$ ≤ 16V, $V_{OUT}$ = 0.

# Pin Information

***TO-263-5 version available, TO-263-3 and TO-220 versions obsolete***

## Pin Configuration

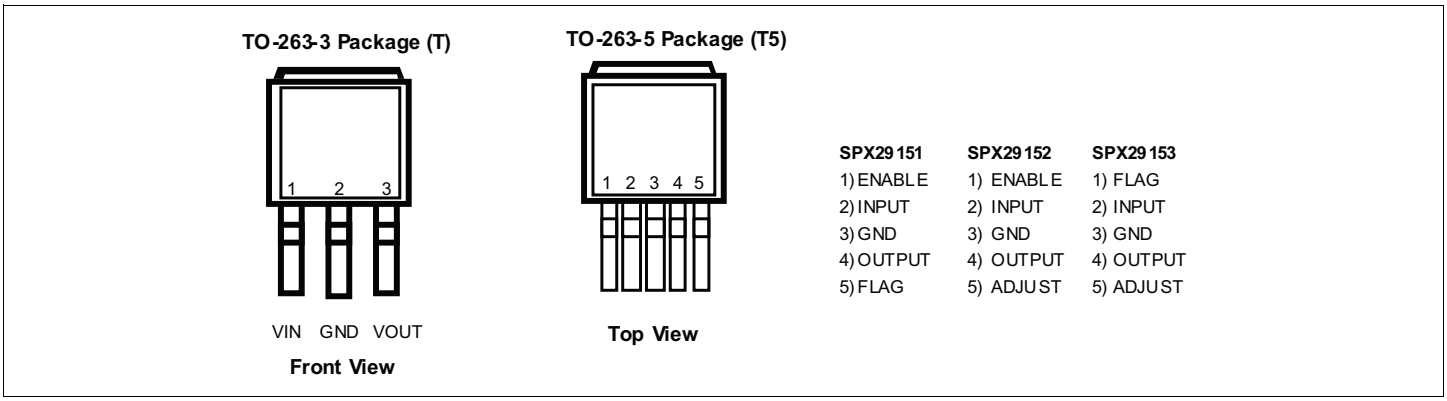



**Figure 3: SPX29151/52/53 Pinout (Top View)—TO-263 Packages**

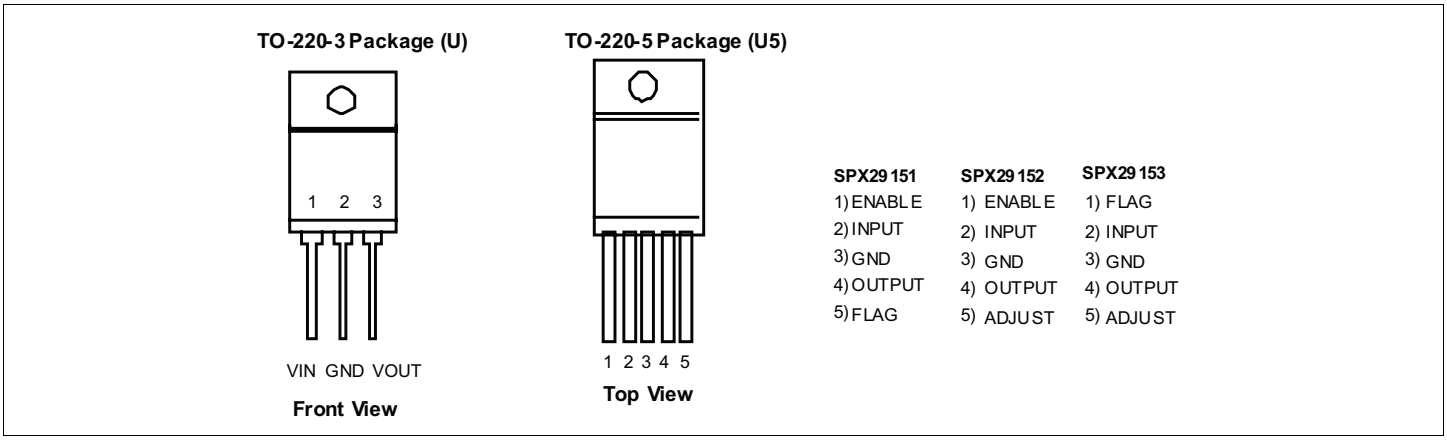



**Figure 4: SPX29151/52/53 Pinout (Top View)—TO-220 Packages**

# Pin Description

## 3-Pin Option

**Table 4: Pin Description**

| Pin Number | Pin Name | Description |
|---|---|---|
| 1 | VIN | Supplies the current to the output power device. |
| 2 | GND | Ground. |
| 3 | VOUT | Regulator output voltage. |

## 5-Pin Option

**Table 5: Pin Description**

| Pin Number | Pin Name | Description |
|---|---|---|
| 1 | ENABLE | SPX29151/52 logic high = enable, logic low = shutdown. |
| 1 | FLAG | SPX29153 active low Error Flag signal that indicates an output fault condition. |
| 2 | INPUT | Supplies the current to the output power device. |
| 3 | GND | Ground. |
| 4 | OUTPUT | Regulator output voltage. |
| 5 | FLAG | SPX29151 active low Error Flag signal that indicates an output fault condition. |
| 5 | ADJUST | Adjustable regulator feedback input that connects to the resistor voltage divider which is placed from OUTPUT to GND to set the desired output voltage. |

# Block Diagram

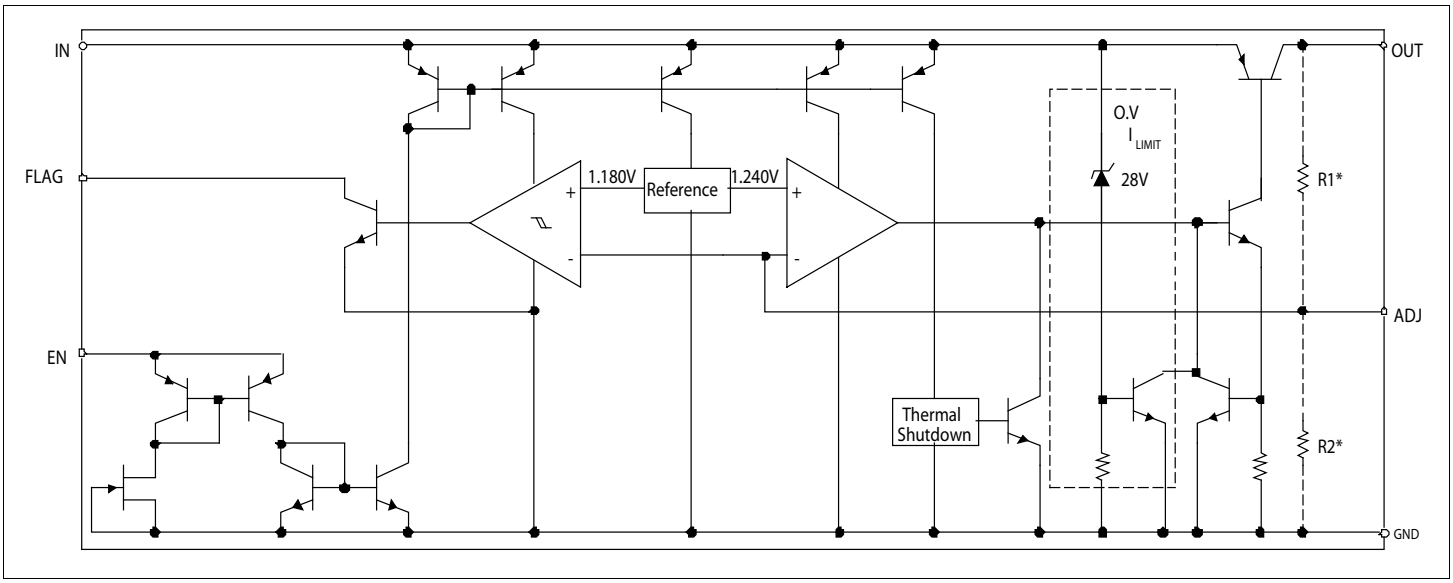



**Figure 5: Functional Block Diagram**

# Application Information

The SPX29150/51/52/53 incorporates protection against overcurrent faults, reversed load insertion, overtemperature operation, and positive and negative transient voltages.

## Thermal Considerations

Although the SPX29150/51/52/53 offer limiting circuitry for overload conditions, it is still necessary to ensure that the maximum junction temperature is not exceeded in the application. Heat flows through the lowest resistance path, the junction-to-case path. To ensure the best thermal flow of the component, proper mounting is required. For thermal resistance and heatsink design, contact the heatsink manufacturer

## TO-220 Design Example

Assume that $V_{IN}$ = 10V, $V_{OUT}$ = 5V, $I_{OUT}$ = 1.5A, $T_A$ = 50°C, $\theta_H$ = 1°C/W, $\theta_{CH}$ = 2°C/W, and $\theta_{JC}$ = 3C°/W, where:

$T_A$ = Ambient temperature,

$\theta_{HA}$ = Heatsink to ambient thermal resistance,

$\theta_{CH}$ = Case to heatsink thermal resistance,

$\theta_{JC}$ = Junction-to-case thermal resistance.

The power calculated under these conditions is:

$P_D = (V_{IN} – V_{OUT}) * I_{OUT}$ = 7.5W.

The junction temperature is calculated as:

$T_J = T_A + P_D * (\theta_{HA} + \theta_{CH} + \theta_{JC})$ or

$T_J = 50 + 7.5 * (1 + 2 + 3) = 95°C$

Reliable operation is ensured.

## Capacitor Requirements

The output capacitor is needed to ensure stability and minimize output noise. The value of the capacitor varies with the load. However, an aluminum capacitor with a minimum value of 10µF ensures stability under all load conditions. MaxLinear recommends a tantalum capacitor if a faster load transient response is needed. If the power source has a high AC impedance, a 0.1µF ceramic capacitor between input and ground is recommended. The output capacitors maximum equivalent series resistance (ESR) value for stable operation is 0.33Ω.

## Minimum Load Current

To ensure proper behavior of the regulator under light loads, a minimum load of 5mA for the SPX29150/51/52/53 is required.

## Typical Application Circuits

Figure 6 shows a typical fixed output regulator. Figure 7 shows an adjustable output regulator. The values of R1 and R2 set the output voltage value as follows:

$V_{OUT} = V_{REF} \times [1 + (R1/R2)]$.

A minimum value of 10kΩ is recommended for R2 with a range between 10kΩ and 47kΩ.

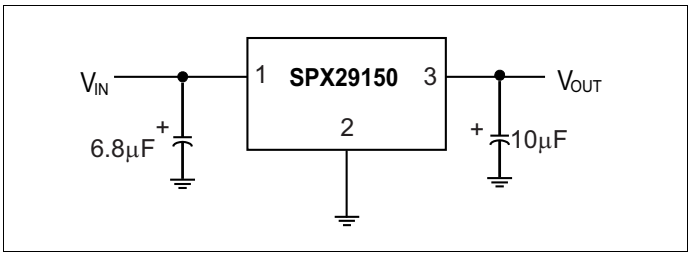



**Figure 6: Fixed Output Linear Regulator**

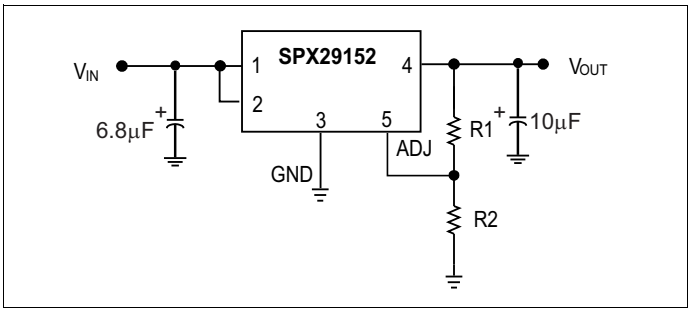



**Figure 7: Adjustable Output Linear Regulator**

# Typical Performance Characteristics

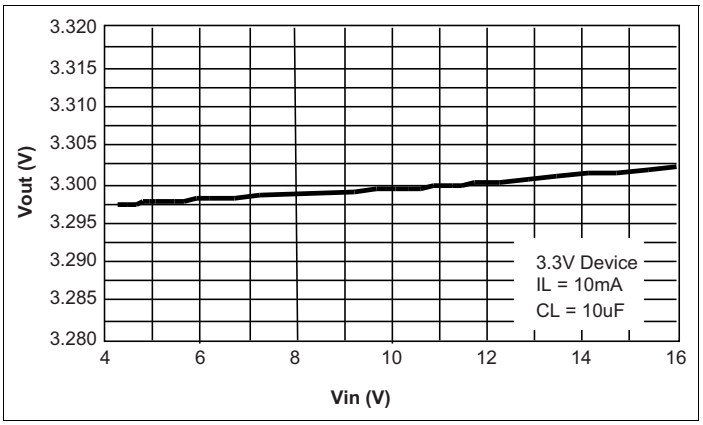



**Figure 8: Line Regulation**

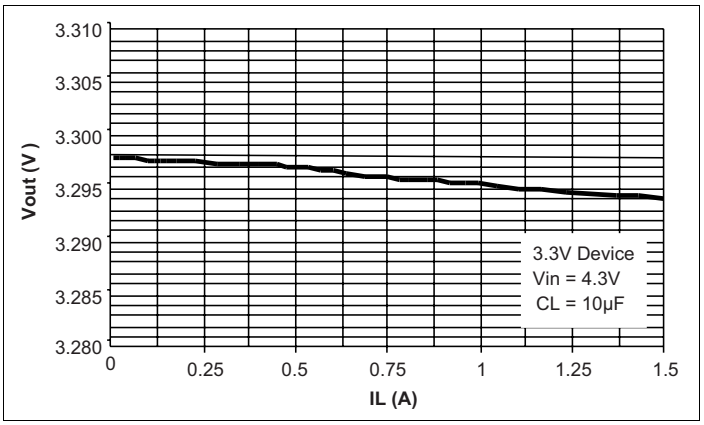



**Figure 9: Load Regulation**

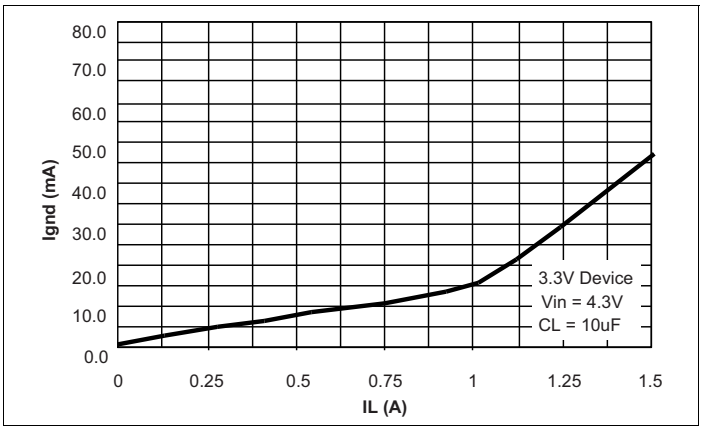



**Figure 10: Ground Current vs Load Current**

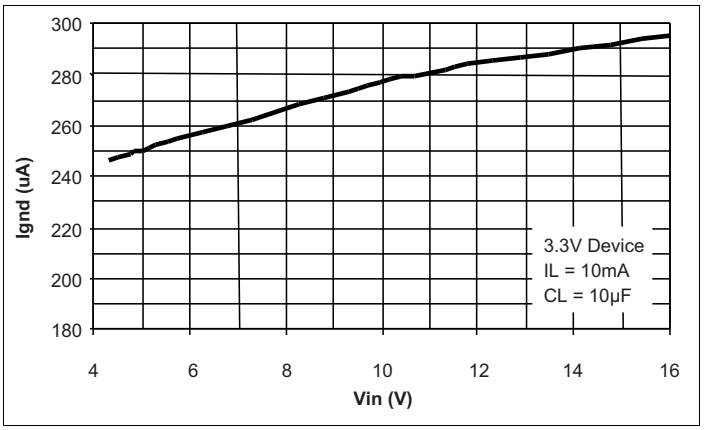



**Figure 11: Ground Current vs Input Voltage**

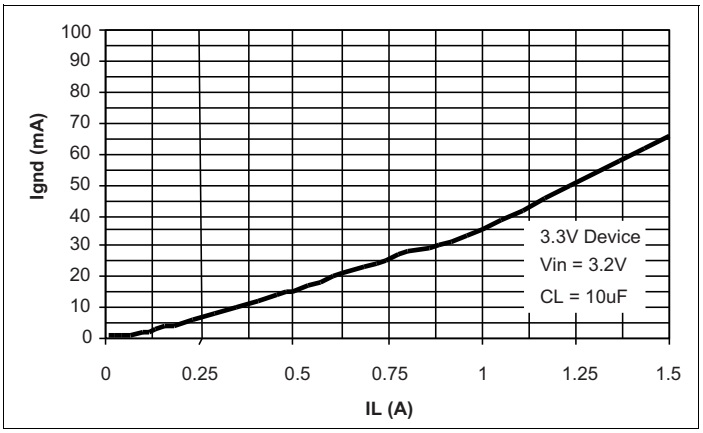



**Figure 12: Ground Current vs Load Current in Dropout**

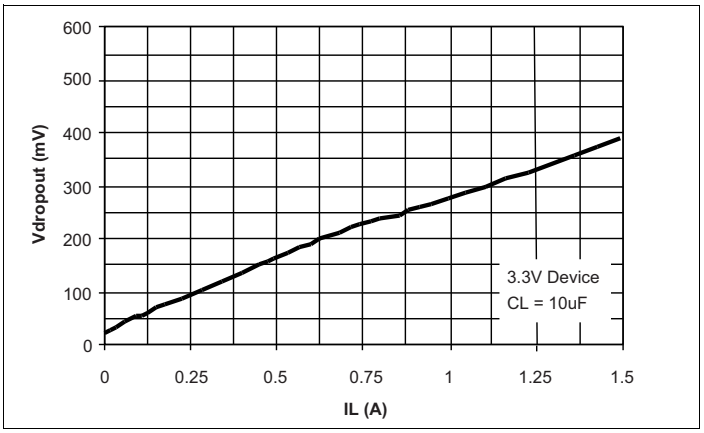



**Figure 13: Dropout Voltage vs Load Current**

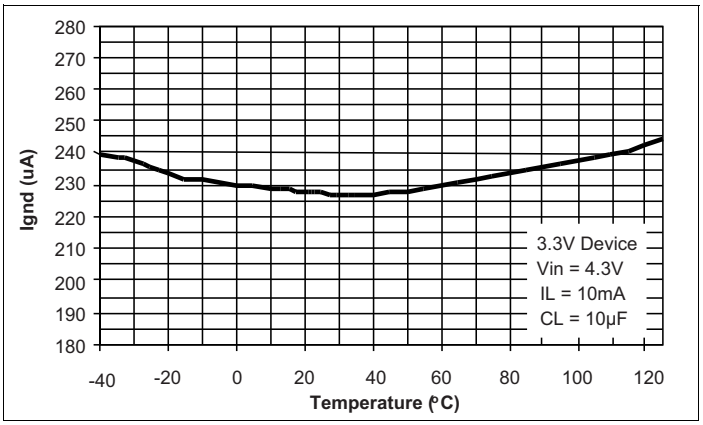



**Figure 14: Ground Current vs Temperature at $I_{LOAD}$ = 10mA**

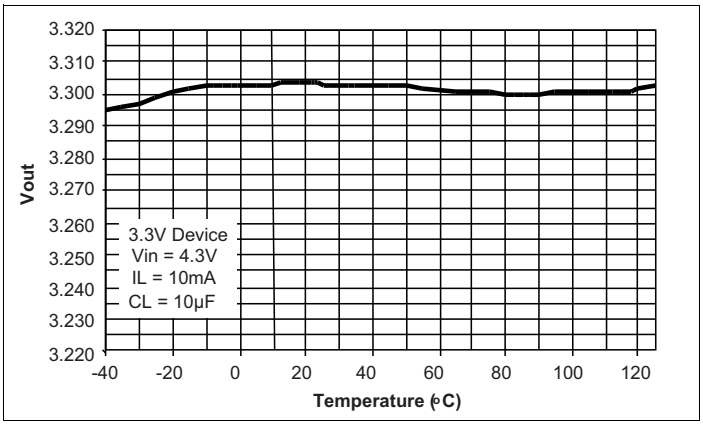



**Figure 15: Output Voltage vs Temperature**

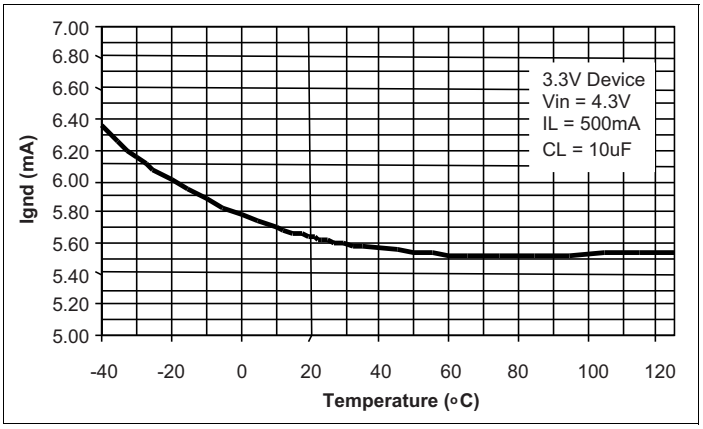



**Figure 16: Ground Current vs Temperature at $I_{LOAD}$ = 500mA**

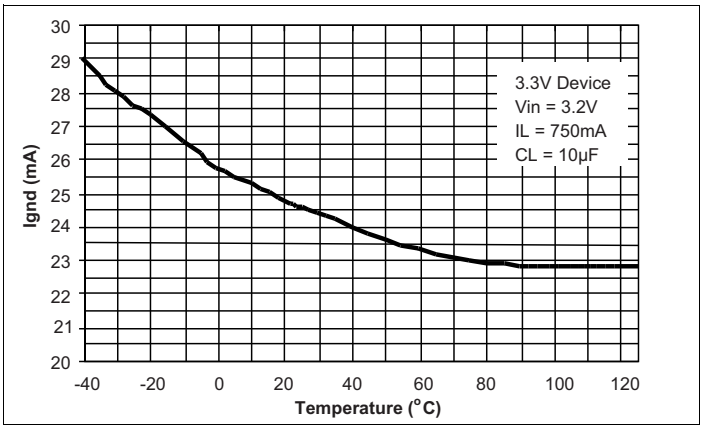



**Figure 17: Ground Current vs Temperature in Dropout at $I_{LOAD}$ = 750mA**

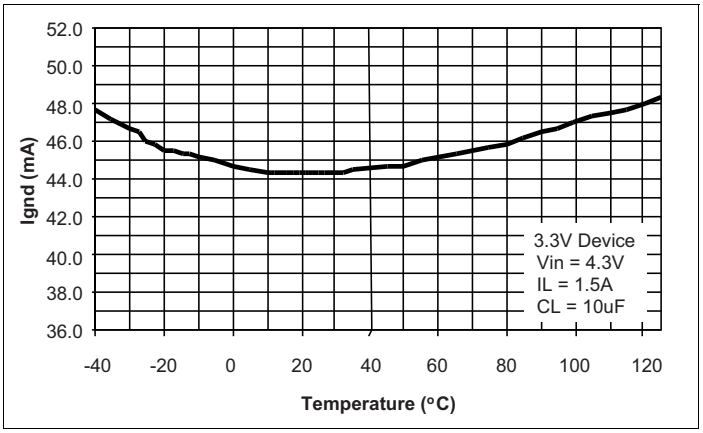



**Figure 18: Ground Current vs Temperature at $I_{LOAD}$ = 1.5A**

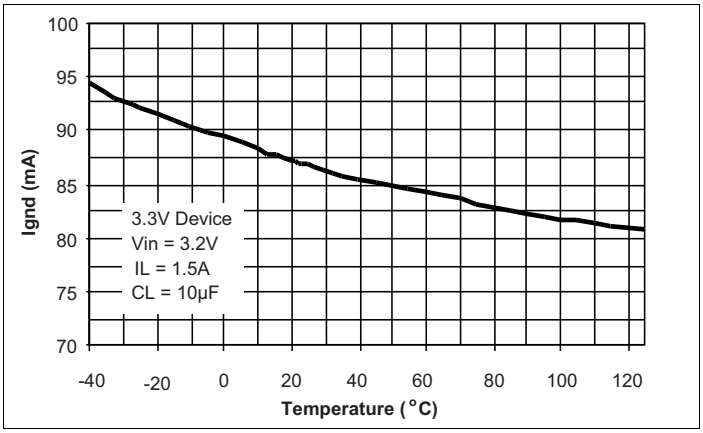



**Figure 19: Ground Current vs Temperature in Dropout**

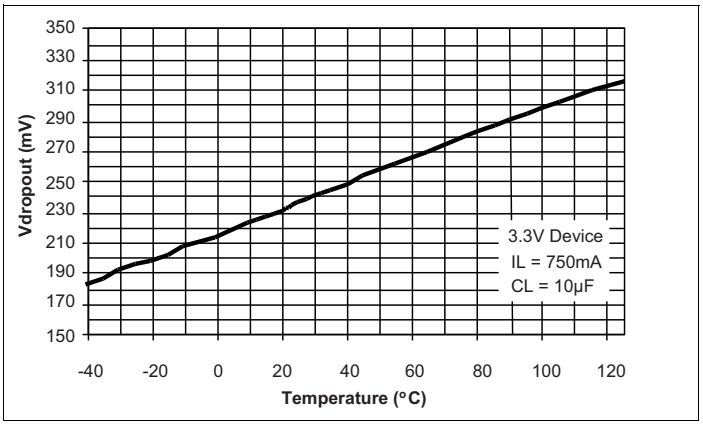



**Figure 20:** Dropout Voltage vs Temperature at $I_{LOAD}$ = 750mA

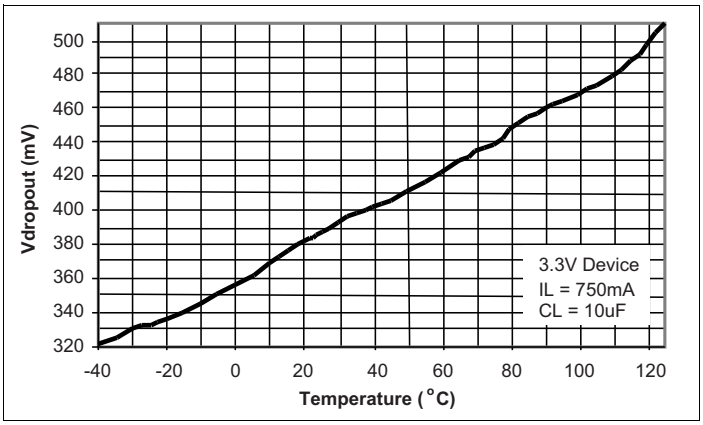



**Figure 21:** Dropout Voltage vs Temperature at $I_{LOAD}$ = 1.5A

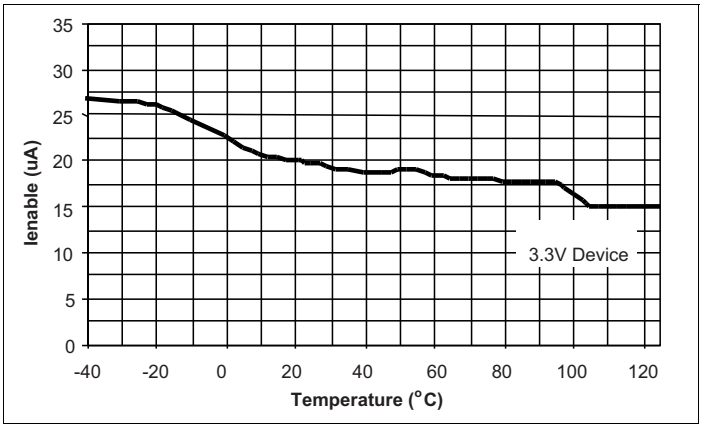



**Figure 22:** ENABLE Current vs Temperature at $V_{EN}$ = 16V

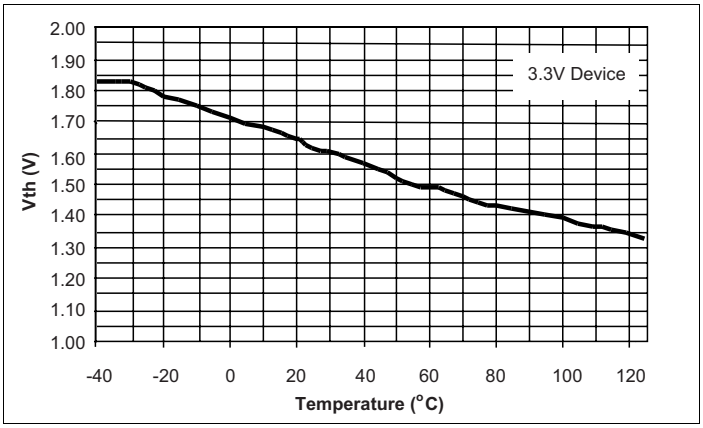
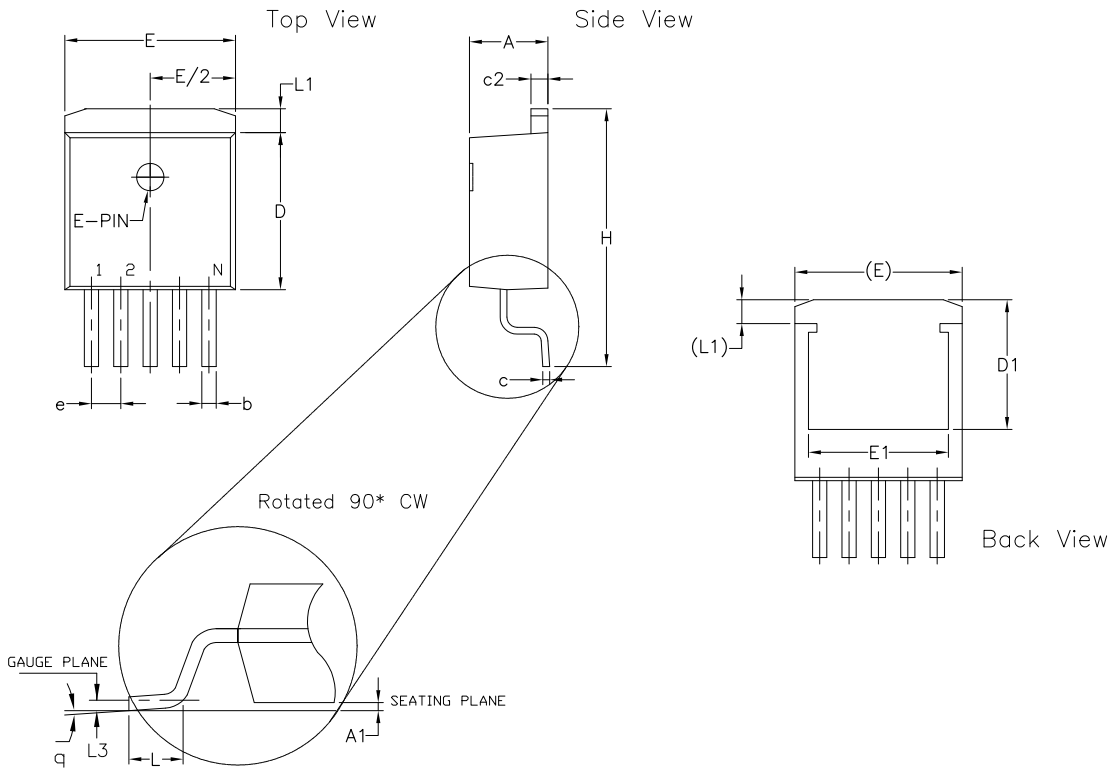



**Figure 23:** ENABLE Threshold vs Temperature

# Mechanical Dimensions

## 3-Pin and 5-Pin TO-263

***TO-263-3 version obsolete***




| 3 Pin TO-263 JEDEC TO-263 Variation AA | | | | | | |
|---|---|---|---|---|---|---|
| SYMBOLS | DIMENSIONS IN INCH (Control Unit) | | | DIMENSIONS IN MM (Reference Unit) | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.160 | — | 0.190 | 4.06 | — | 4.83 |
| A1 | 0.000 | — | 0.010 | 0.00 | — | 0.25 |
| b | 0.020 | — | 0.039 | 0.51 | — | 0.99 |
| b2 | 0.045 | — | 0.070 | 1.14 | — | 1.78 |
| c | 0.015 | — | 0.029 | 0.38 | — | 0.74 |
| c2 | 0.045 | — | 0.065 | 1.14 | — | 1.65 |
| D | 0.330 | — | 0.380 | 8.38 | — | 9.65 |
| D1 | 0.270 | — | — | 6.86 | — | — |
| E | 0.380 | — | 0.420 | 9.65 | — | 10.67 |
| E1 | 0.245 | — | — | 6.22 | — | — |
| e | 0.100 BSC | | | 2.54 BSC | | |
| H | 0.575 | — | 0.625 | 14.61 | — | 15.88 |
| L | 0.070 | — | 0.110 | 1.78 | — | 2.79 |
| L1 | — | — | 0.066 | — | — | 1.68 |
| L3 | 0.010 BSC | | | 0.25 BSC | | |
| q | 0° | | 8° | 0° | | 8° |
| N | 3 | | | 3 | | |

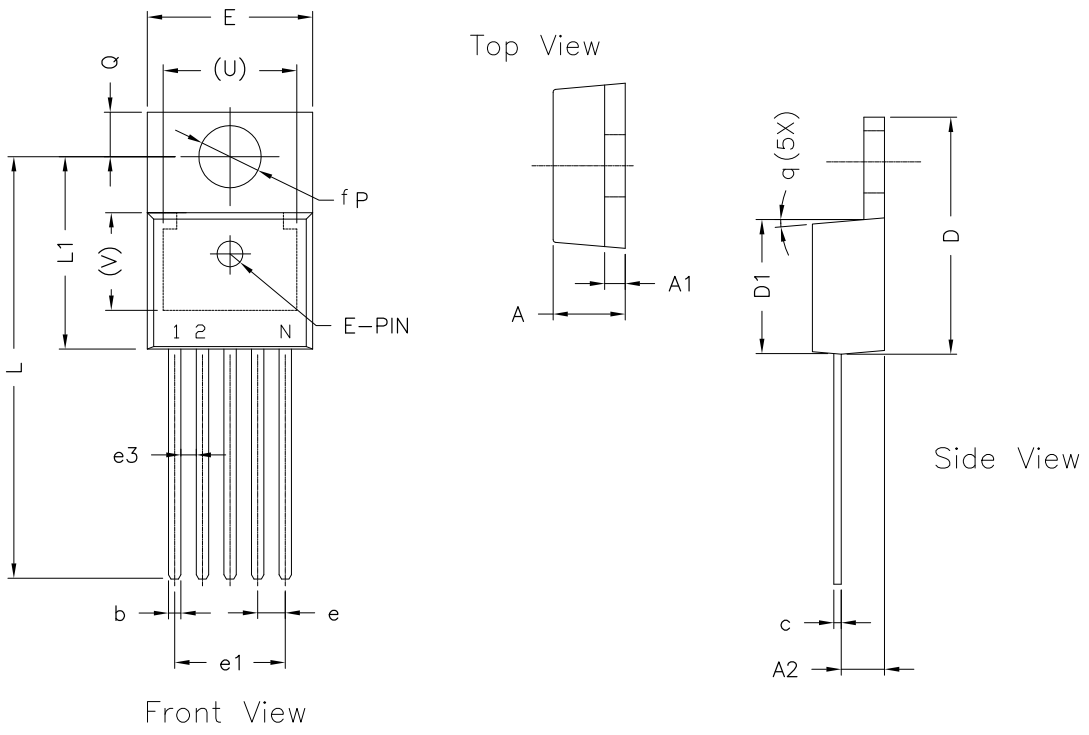
| 5 Pin TO-263 JEDEC TO-263 Variation BA | | | | | | |
|---|---|---|---|---|---|---|
| SYMBOLS | DIMENSIONS IN INCH (Control Unit) | | | DIMENSIONS IN MM (Reference Unit) | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.160 | — | 0.190 | 4.06 | — | 4.83 |
| A1 | 0.000 | — | 0.010 | 0.00 | — | 0.25 |
| b | 0.020 | — | 0.039 | 0.51 | — | 0.99 |
| c | 0.015 | — | 0.029 | 0.38 | — | 0.74 |
| c2 | 0.045 | — | 0.065 | 1.14 | — | 1.65 |
| D | 0.330 | — | 0.380 | 8.38 | — | 9.65 |
| D1 | 0.270 | — | — | 6.86 | — | — |
| E | 0.380 | — | 0.420 | 9.65 | — | 10.67 |
| E1 | 0.245 | — | — | 6.22 | — | — |
| e | 0.067 BSC | | | 1.70 BSC | | |
| H | 0.575 | — | 0.625 | 14.61 | — | 15.88 |
| L | 0.070 | — | 0.110 | 1.78 | — | 2.79 |
| L1 | — | — | 0.066 | — | — | 1.68 |
| L3 | 0.010 BSC | | | 0.25 BSC | | |
| q | 0° | | 8° | 0° | | 8° |
| N | 5 | | | 5 | | |

Drawing No: POD-00000021
Revision: A

**Figure 24: Mechanical Dimensions—3-Pin and 5-Pin TO-263**

# 3-Pin and 5-Pin TO-220

***TO-220 versions obsolete***




| 3 Pin TO-220 (Option 1)* JEDEC TO-220-AB | | | | |
|---|---|---|---|---|
| SYMBOLS | DIMENSIONS IN INCH (Control Unit) | | DIMENSIONS IN MM (Reference Unit) | |
| | MIN | MAX | MIN | MAX |
| A | 0.140 | 0.190 | 3.56 | 4.82 |
| A1 | 0.020 | 0.055 | 0.51 | 1.40 |
| A2 | 0.080 | 0.115 | 2.03 | 2.92 |
| b | 0.015 | 0.040 | 0.38 | 1.02 |
| c | 0.014 | 0.024 | 0.36 | 0.61 |
| D | 0.560 | 0.650 | 14.22 | 16.51 |
| D1 | 0.330 | 0.355 | 8.38 | 9.02 |
| D2 | 0.480 | 0.507 | 12.19 | 12.88 |
| E | 0.380 | 0.420 | 9.65 | 10.67 |
| E1 | 0.270 | 0.350 | 6.86 | 8.89 |
| e | 0.100 BSC | | 2.54 BSC | |
| e1 | 0.200 BSC | | 5.08 BSC | |
| H1 | 0.230 | 0.270 | 5.84 | 6.86 |
| L | 0.500 | 0.580 | 12.70 | 14.73 |
| L1 | — | 0.250 | — | 6.35 |
| P | 0.139 | 0.156 | 3.53 | 3.96 |
| Q | 0.103 | 0.113 | 2.62 | 2.87 |
| V | 0.240 REF | | 6.10 REF | |
| q | 3° | 7° | 3° | 7° |
| N | 3 | | 3 | |

* Refer to product datasheet for POD option being used

| 3 Pin TO-220 (Option 2)* | | | | |
|---|---|---|---|---|
| SYMBOLS | DIMENSIONS IN INCH (Control Unit) | | DIMENSIONS IN MM (Reference Unit) | |
| | MIN | MAX | MIN | MAX |
| A | 0.140 | 0.190 | 3.56 | 4.82 |
| A1 | 0.020 | 0.055 | 0.51 | 1.40 |
| A2 | 0.080 | 0.115 | 2.03 | 2.92 |
| b | 0.015 | 0.040 | 0.38 | 1.02 |
| c | 0.014 | 0.024 | 0.36 | 0.61 |
| D | 0.560 | 0.650 | 14.22 | 16.51 |
| D1 | 0.330 | 0.355 | 8.38 | 9.02 |
| D2 | 0.480 | 0.507 | 12.19 | 12.88 |
| E | 0.380 | 0.420 | 9.65 | 10.67 |
| E1 | 0.270 | 0.350 | 6.86 | 8.89 |
| e | 0.100 BSC | | 2.54 BSC | |
| e1 | 0.200 BSC | | 5.08 BSC | |
| H1 | 0.230 | 0.270 | 5.84 | 6.86 |
| L | 0.500 | 0.580 | 12.70 | 14.73 |
| L1 | 0.345 BSC | | 8.76 BSC | |
| P | 0.139 | 0.156 | 3.53 | 3.96 |
| Q | 0.103 | 0.113 | 2.62 | 2.87 |
| V | 0.240 REF | | 6.10 REF | |
| q | 3° | 7° | 3° | 7° |
| N | 3 | | 3 | |

* Refer to product datasheet for POD option being used

| 5 Pin TO-220 JEDEC TS-001 Variation AA | | | | |
|---|---|---|---|---|
| SYMBOLS | DIMENSIONS IN INCH (Control Unit) | | DIMENSIONS IN MM (Reference Unit) | |
| | MIN | MAX | MIN | MAX |
| A | 0.165 | 0.190 | 4.19 | 4.82 |
| A1 | 0.035 | 0.055 | 0.89 | 1.39 |
| A2 | 0.085 | 0.115 | 2.16 | 2.92 |
| b | 0.020 | 0.040 | 0.51 | 1.01 |
| c | 0.012 | 0.025 | 0.31 | 0.63 |
| D | 0.570 | 0.625 | 14.48 | 15.87 |
| D1 | 0.330 | 0.370 | 8.39 | 9.39 |
| E | 0.390 | 0.415 | 9.91 | 10.54 |
| e | 0.067 BSC | | 1.70 BSC | |
| e1 | 0.263 | 0.273 | 6.68 | 6.93 |
| e3 | 0.030 | 0.040 | 0.76 | 1.02 |
| L | 0.945 | 1.045 | 24.00 | 26.54 |
| L1 | 0.465 | 0.539 | 11.81 | 13.69 |
| P | 0.139 | 0.156 | 3.53 | 3.96 |
| Q | 0.103 | 0.113 | 2.62 | 2.87 |
| U | 0.300 REF | | 7.62 REF | |
| V | 0.240 REF | | 6.10 REF | |
| q | 3° | 7° | 3° | 7° |
| N | 5 | | 5 | |

Drawing No: POD-00000020
Revision: A

**Figure 25: Mechanical Dimensions—3-Pin and 5-Pin TO-220**

# Ordering Information

***TO-263-5 version available, TO-263-3 and TO-220 versions obsolete***

**Table 6: Ordering Information**

| Ordering Part Number | Operating Temperature Range | Accuracy | Output Voltage | Package | Packaging |
|---|---|---|---|---|---|
| SPX29152T5-L/TR | –40°C ≤ $T_J$ ≤ 125°C | 2% | ADJ | TO-263-5 | 500/Tape and Reel |

**Note:** For more information about part numbers, as well as the most up-to-date information and additional information on environmental rating, go to www.maxlinear.com/SPX29150, www.maxlinear.com/SPX29151, and www.maxlinear.com/SPX29152.

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