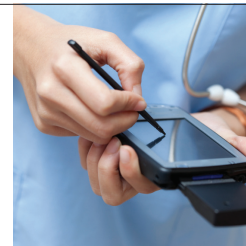


Linear Low Dropout (LDO) Regulator Solutions

High Performance Analog ICs



Introduction

We offer a broad line of high performance low dropout (LDO) linear regulators with fast transient response, excellent line and load regulation, and very wide input voltage range from 0.9V to 100V. Output currents range from 20mA to 10A, with positive, negative and multiple output versions available. Many devices offer output voltage operation $<0.8V$ and some feature operation as low as 0V, even with a single supply. Most are stable with ceramic output capacitors. Our PNP-based linear regulators offer reverse-input, reverse-output, and reverse-current protection. Our LDO+™ devices include monitoring of voltage, current, temperature and diagnostic flags that indicate fault conditions. LDO regulators can be applied in virtually any application. For the most current product information, please visit www.linear.com.

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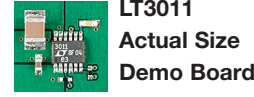
Current Sources

| | |
|-----------------------|---|
| Current Sources | 7 |
|-----------------------|---|

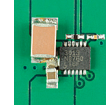
High Voltage PNP Positive Linear Regulators

PNP family features:

- Rugged and Hard to Kill
- Up to 80V_{IN} Continuous Operation
- Low Output Voltage Noise
- Extensive Reverse Protection for Harsh Environments in Automotive, Avionics and Industrial Applications

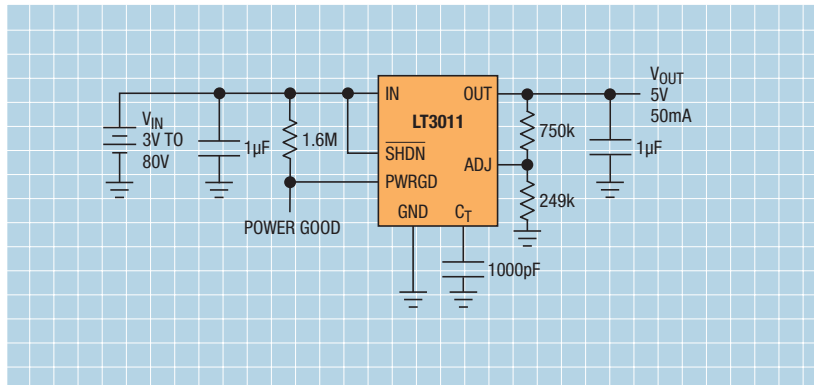


LT3011
Actual Size
Demo Board

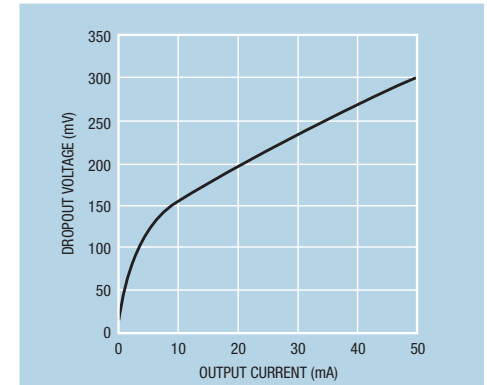


LT3013
Actual Size
Demo Board

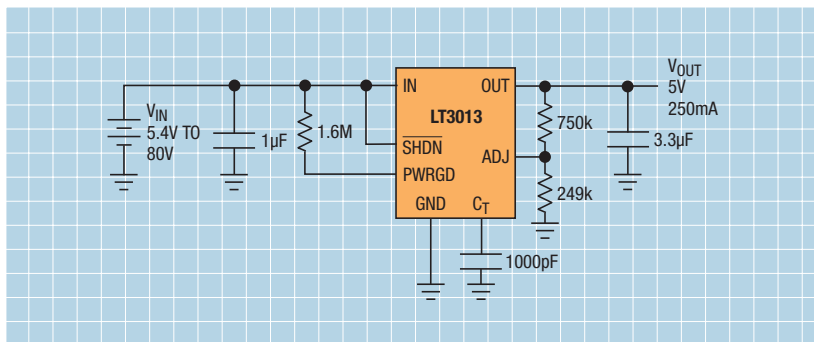
LT[®]3011: 50mA, 3V to 80V Low Dropout Micropower Linear Regulator with PWRGD



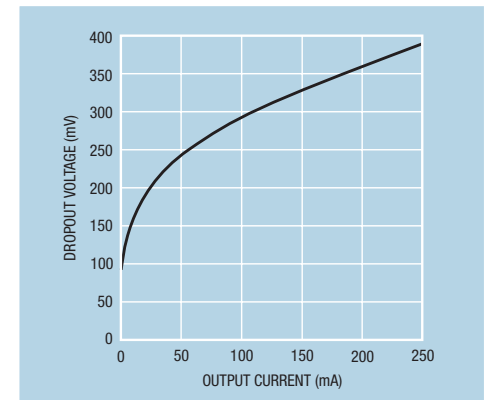
Dropout Voltage



LT3013: 250mA, 4V to 80V Low Dropout Micropower Linear Regulator with PWRGD



Dropout Voltage



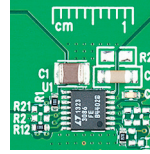
| Part Number | Output Current (A) | Min V _{IN} (V) | Max V _{IN} (V) | Reference Voltage (V) | Dropout Voltage (V@I _{OUT}) | Typ I _Q (Supply) (µA) | Output Voltage (V) | Noise (µV _{RMS}) or % of V _{OUT} | Temperature Grade | Package |
|--|--------------------|-------------------------|-------------------------|-----------------------|---------------------------------------|----------------------------------|----------------------|---|-------------------|-----------------------|
| High Voltage PNP Positive Linear Regulators | | | | | | | | | | |
| LT3014 | 0.02 | 3.0 | 80 | 1.22 | 0.35 | 7 | Adj (1.22 to 60) | 115 | E I | TSOT-5, 3x3 DFN-8 |
| LT3014HV | 0.02 | 3.0 | 100 | 1.22 | 0.35 | 7 | Adj (1.22 to 60) | 115 | E I | TSOT-5, 3x3 DFN-8 |
| LT3014B | 0.02 | 3.0 | 80 | 1.22 | 0.35 | 7 | Adj (1.22 to 60) | 115 | E I | TSOT-5, 3x3 DFN-8 |
| LT3014BHV | 0.02 | 3.0 | 100 | 1.22 | 0.35 | 7 | Adj (1.22 to 60) | 115 | E I | TSOT-5, 3x3 DFN-8 |
| LT3010 | 0.05 | 3.0 | 80 | 1.275 | 0.30 | 30 | Adj (1.275 to 60), 5 | 100 | E H MP | MSOP-8E |
| LT3011*† | 0.05 | 3.0 | 80 | 1.24 | 0.30 | 45 | Adj (1.24 to 60) | 100 | E I H | MSOP-12E, 3x3 DFN-10 |
| LT3012 | 0.25 | 4.0 | 80 | 1.24 | 0.40 | 40 | Adj (1.24 to 60) | 100 | E H | TSSOP-16E, 3x4 DFN-12 |
| LT3012B | 0.25 | 4.0 | 80 | 1.24 | 0.40 | 40 | Adj (1.24 to 60) | 100 | E | TSSOP-16E, 3x4 DFN-12 |
| LT3013*† | 0.25 | 4.0 | 80 | 1.24 | 0.40 | 65 | Adj (1.24 to 60) | 100 | E H MP | TSSOP-16E, 3x4 DFN-12 |
| LT3013B*† | 0.25 | 4.0 | 80 | 1.24 | 0.40 | 65 | Adj (1.24 to 60) | 100 | E | TSSOP-16E, 3x4 DFN-12 |

* Power Good † LDO+

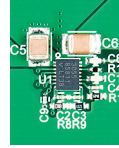
PNP Positive Linear Regulators

PNP family features:

- Low Output Voltage Noise
- Wide Voltage Range
- Low Dropout Voltage
- Fast Transient Response and Extensive Reverse Protection
- Precision Current Limits

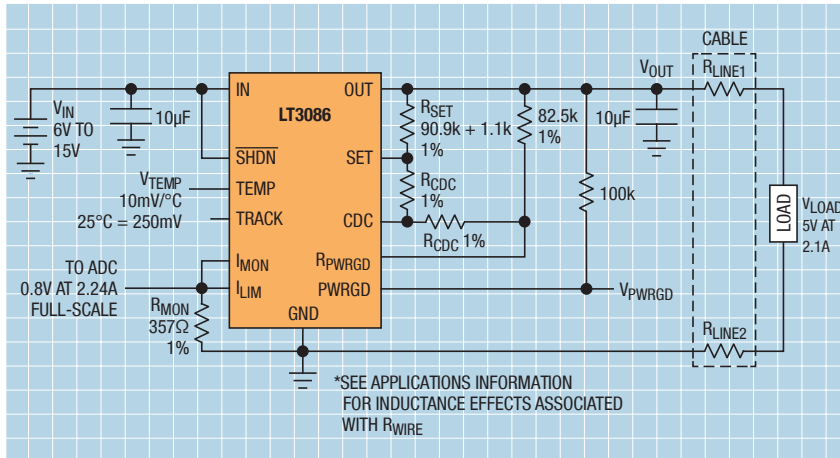


LT3086
Actual Size
Demo Board

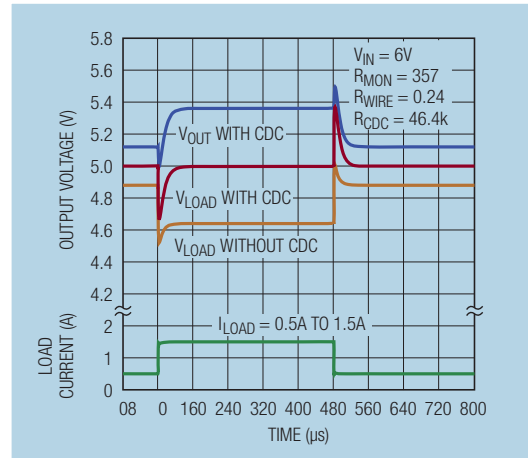


LT3055
Actual Size
Demo Board

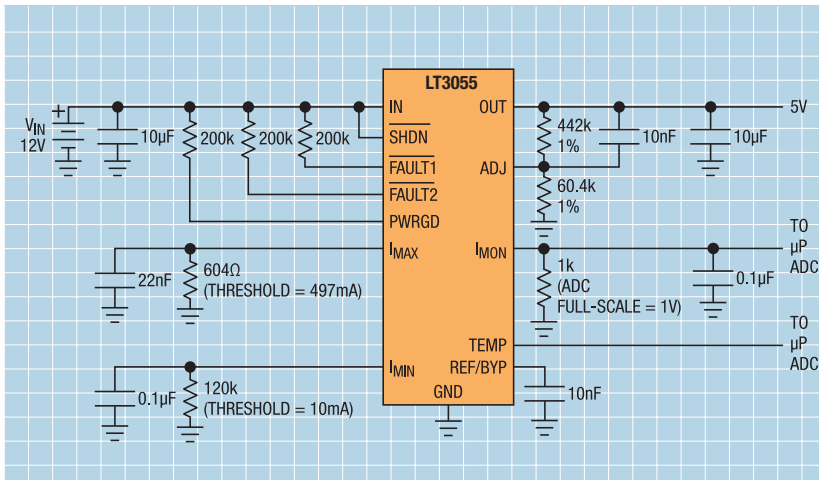
LT3086: 1.5A Rail-to-Rail, Low Dropout PNP Linear Regulator with Monitoring and Cable Drop Compensation



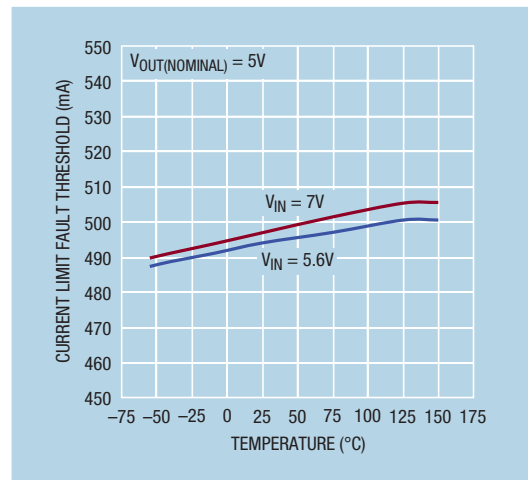
Transient Response with Cable Drop Compensation (CDC)



LT3055: 500mA Linear Regulator with Precision Current Limit and Diagnostics



External Current Limit $R_{IMAX} = 604\Omega$



| Part Number | Output Current (A) | Min V_{IN} (V) | Max V_{IN} (V) | Reference Voltage (V) | Dropout Voltage ($V@I_{OUT}$) | Typ I_Q (Supply) (μ A) | Output Voltage (V) | Noise (μ V _{RMS}) or % of V_{OUT} | Temperature Grade | Package |
|---------------------------------------|--------------------|------------------|------------------|-----------------------|---------------------------------|-------------------------------|---|--|-------------------|--|
| PNP Positive Linear Regulators | | | | | | | | | | |
| LT1761 | 0.1 | 1.8 | 20 | 1.22 | 0.30 | 20 | Adj (1.22 to 19.5), 1.2, 1.5, 1.8, 2, 2.5, 2.8, 3, 3.3, 5 | 20 | E I MP | TSOT-5 |
| LT3050 [§] | 0.1 | 1.6 | 45 | 0.60 | 0.34 | 45 | Adj (0.6 to 44.5), 3.3, 5 | 30 | E I MP | 2x3 DFN-12, MSOP-12E |
| LT3060 | 0.1 | 1.6 | 45 | 0.60 | 0.30 | 40 | Adj (0.6 to 44.5), 1.2, 1.5, 1.8, 2.5, 3.3, 5, 15 | 30 | E I H MP | 2x2 DFN-8, TSOT-8 |
| LT3061 [#] | 0.1 | 1.6 | 45 | 0.60 | 0.25 | 45 | Adj (0.6 to 19) | 30 | E I H MP | 2x3 DFN-8, MSOP-8E |
| LT1020 | 0.125 | 4.5 | 36 | 2.50 | 0.40 | 40 | Adj | – | C I | SO-16, DIP-14 |
| LT1120/A | 0.125 | 4.5 | 36 | 2.50 | 0.40 | 40 | Adj | – | C I | SO-8, DIP-8 |
| LT1121/A/HV | 0.15 | 4.2 | 30/36 | 3.75 | 0.42 | 30 | Adj (3.75 to 29/35), 3.3, 5 | – | C I | SOT-223, SO-8, TO-92, DIP-8 |
| LT1762 | 0.15 | 1.8 | 20 | 1.22 | 0.27 | 25 | Adj (1.22 to 19.5), 2.5, 3, 3.3, 5 | 20 | E | MSOP-8 |
| LT3062 | 0.2 | 1.6 | 45 | 0.60 | 0.30 | 45 | Adj (0.6 to 40) | 30 | E I H MP | 2x3 DFN-8, MSOP-8E |
| LT3063 [#] | 0.2 | 1.6 | 45 | 0.60 | 0.30 | 45 | Adj (0.6 to 19) | 30 | E I H MP | 2x3 DFN-8, MSOP-8E |
| LT1521 | 0.3 | 4.3 | 20 | 3.75 | 0.50 | 12 | Adj (3.75 to 19), 3, 3.3, 5 | – | C I | SOT-223, SO-8, MSOP-8 |
| LT1579 | 0.3 | 2.7 | 20 | 1.50 | 0.40 | 50 | Adj (1.5 to 19), 3, 3.3, 5 | – | C | SO-8, SO-16, SSOP-16 |
| LT1962 | 0.3 | 1.8 | 20 | 1.22 | 0.27 | 30 | Adj (1.22 to 19.5), 1.5, 1.8, 2.5, 3, 3.3, 5 | 20 | E | MSOP-8 |
| LT1763 | 0.5 | 1.8 | 20 | 1.22 | 0.30 | 30 | Adj (1.22 to 19.5), 1.5, 1.8, 2.5, 3, 3.3, 5 | 20 | C I MP | 3x4 DFN-12, SO-8, |
| LT3055 ^{‡§} | 0.5 | 2.0 | 45 | 0.60 | 0.35 | 65 | Adj (0.6 to 44.5) | 25 | E I H MP | 3x4 DFN-16, MSOP-16E |
| LT3065 ^{‡§} | 0.5 | 2.0 | 45 | 0.60 | 0.30 | 55 | Adj (0.6 to 44.5) | 25 | E I H MP | 3x3 DFN-10, MSOP-12E |
| LT1129 | 0.7 | 4.2 | 30 | 3.75 | 0.40 | 50 | Adj (3.75 to 29), 3.3, 5 | – | E I MP | DD-Pak, SOT-223, SO-8, TO-220, TSSOP-20 |
| LT1965 | 1.1 | 1.8 | 20 | 1.20 | 0.31 | 500 | Adj (1.2 to 19.5), 1.5, 1.8, 2.5, 3.3 | 40 | E I H | 3x3 DFN-8, MSOP-8E, DD-Pak, TO-220 |
| LT1963/A* | 1.5 | 2.1 | 20 | 1.21 | 0.34 | 1mA | Adj (1.21 to 19.5), 1.5, 1.8, 2.5, 3.3 | 40 | E I MP | TSSOP-16E, DD-Pak, TO-220, SOT-223, SO-8 |
| LT3081 ^{†§} | 1.5 | 1.2 | 36 | 50 μ A | 1.21 | 1.1mA | Adj (0 to 34.5) | 27 | E I H MP | 4x4 DFN-12, TSSOP-16E, TO-220, DD-Pak |
| LT3086 ^{‡§} | 2.1 | 1.4 | 40 | 400mV/50 μ A | 0.33 | 1.2mA | Adj (0.4 to 32) [†] | 40 | E I MP | TSSOP-16E, 4x5 DFN-16, DD-Pak, TO-220 |
| LT1528 | 3.0 | 3.9 | 15 | 3.30 | 0.60 | 400 | Adj (3.3 to 14), 3.3 | – | C | DD-Pak, TO-220 |
| LT1529 | 3.0 | 3.9 | 15 | 3.75 | 0.60 | 50 | Adj (3.75 to 14), 3.3, 5 | – | C I | DD-Pak, TO-220 |
| LT1764/A* | 3.0 | 2.7 | 20 | 1.21 | 0.34 | 1mA | Adj (1.21 to 19.5), 1.5, 1.8, 2.5, 3.3 | 40 | E MP | DD-Pak, TO-220, TSSOP-16E |

**A* Versions are stable with ceramic capacitors † Single-Resistor V_{OUT} Set ‡ Power Good # Active Discharge § LDO+

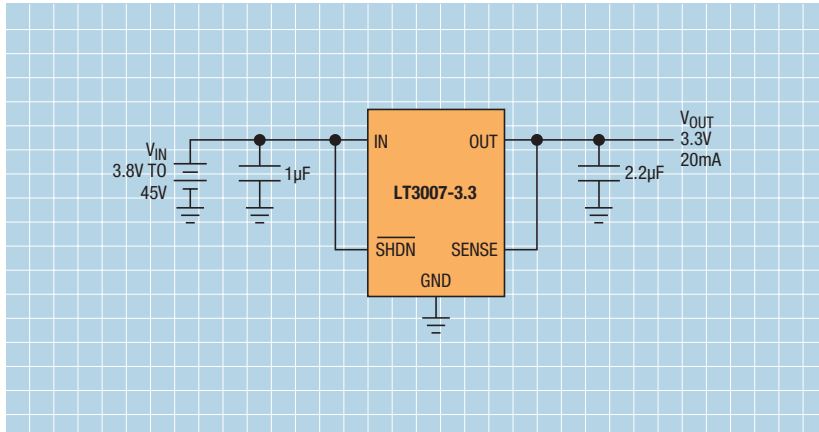
Micropower PNP Positive Linear Regulators

Micropower PNP family features:

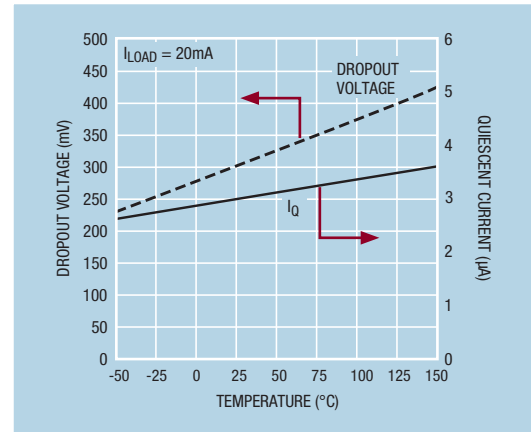
- Sub-5 μ A Quiescent Current
- Good Output Noise Performance
- Keep Alive, Real-Time Clock and Remote Monitoring Applications



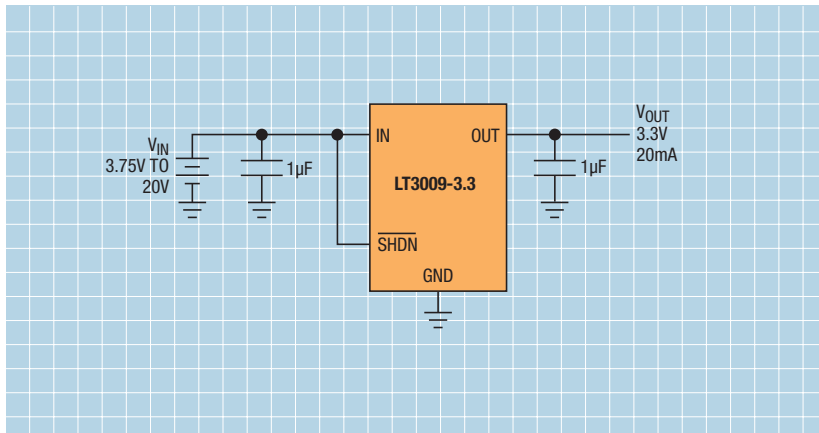
LT3007: 3 μ A I_Q , 20mA, 45V Low Dropout Fault Tolerant Linear Regulator



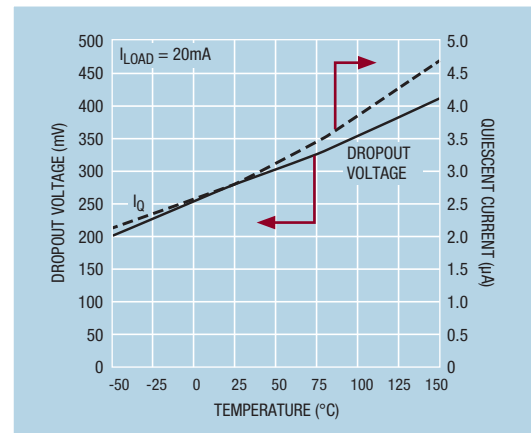
Dropout Voltage/Quiescent Current



LT3009: 3 μ A I_Q , 20mA Low Dropout Linear Regulator



Dropout Voltage/Quiescent Current



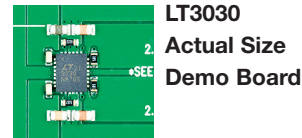
| Part Number | Output Current (A) | Min V_{IN} (V) | Max V_{IN} (V) | Reference Voltage (V) | Dropout Voltage ($V@I_{OUT}$) | Typ I_Q (Supply) (μ A) | Output Voltage (V) | Noise (μ V _{RMS}) or % of V_{OUT} | Temperature Grade | Package |
|--|--------------------|------------------|------------------|-----------------------|---------------------------------|-------------------------------|---|--|-------------------|-------------------|
| Micropower PNP Positive Linear Regulators | | | | | | | | | | |
| LT3009 | 0.02 | 1.6 | 20 | 0.60 | 0.28 | 3 | Adj (0.6 to 19.5), 1.2, 1.5, 1.8, 2.5, 3.3, 5 | 150 | E I | SC70-8, 2x2 DFN-6 |
| LT3007* | 0.02 | 2.0 | 45 | 0.60 | 0.30 | 3 | Adj (0.6 to 44.5), 1.2, 1.5, 1.8, 2.5, 3.3, 5 | 92 | E I | TSOT-8 |
| LT3008 | 0.02 | 2.0 | 45 | 0.60 | 0.30 | 3 | Adj (0.6 to 44.5), 1.2, 1.5, 1.8, 2.5, 3.3, 5 | 92 | E I MP | TSOT-8, 2x2 DFN-6 |

*FMEA Fault Tolerant version

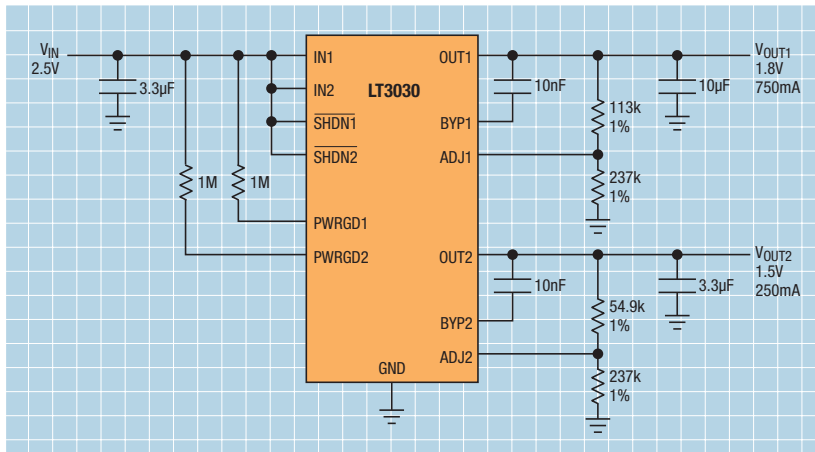
Dual Output PNP Linear Regulators

Dual linear regulator family features:

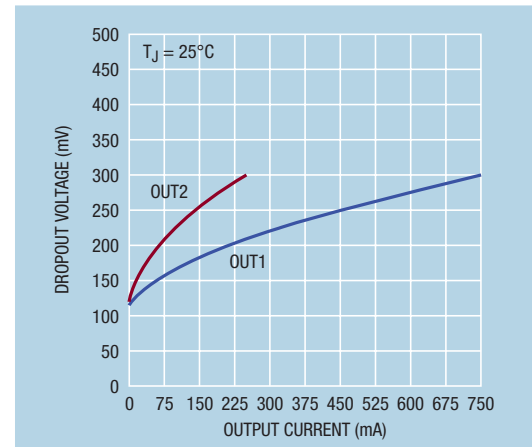
- Highly Compact Solution
- All the Performance Features of our Single PNP Regulators
- Ideal for Core/Logic Combinations



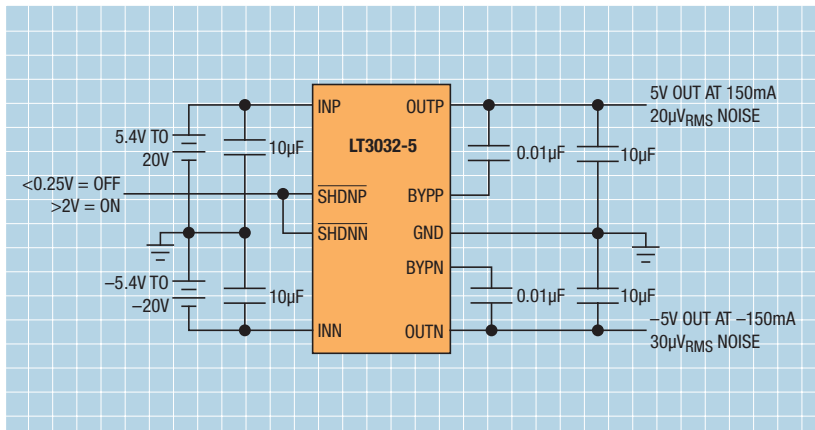
LT3030: Dual 750mA/250mA Low Dropout, Low Noise Micropower Linear Regulator



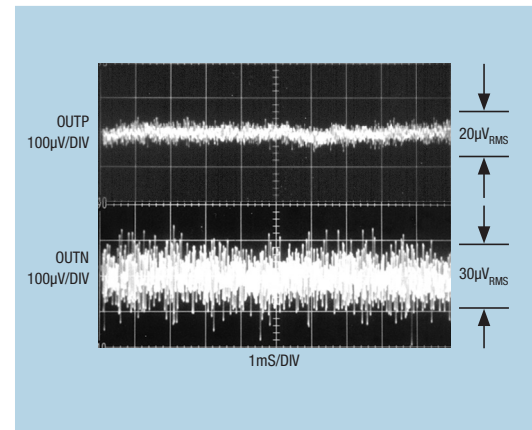
Dropout Voltage vs Load Current



LT3032: Dual 150mA Positive/Negative Low Noise Regulator



10Hz to 100kHz Output Noise



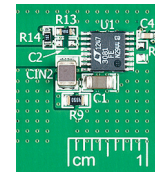
| Part Number | Output Current (A) | Min V_{IN} (V) | Max V_{IN} (V) | Reference Voltage (V) | Dropout Voltage ($V@I_{OUT}$) | Typ I_Q (Supply) (μ A) | Output Voltage (V) | Noise (μ V _{RMS}) or % of V_{OUT} | Temperature Grade | Package |
|--|--------------------|------------------|------------------|-----------------------|---------------------------------|-------------------------------|-------------------------|--|-------------------|-----------------------|
| Dual Output Positive Linear Regulators | | | | | | | | | | |
| LT3023 | 0.1/0.1 | 1.8 | 20 | 1.22 | 0.30 | 40 | Adj (1.22 to 20) | 20 | E I | MSOP-10E, 3x3 DFN-10 |
| LT3027 | 0.1/0.1 | 1.8 | 20 | 1.22 | 0.30 | 50 | Adj (1.22 to 20) | 20 | E I | MSOP-10E, 3x3 DFN-10 |
| LT3024 | 0.1/0.5 | 1.8 | 20 | 1.22 | 0.30 | 60 | Adj (1.22 to 20) | 20 | E I | TSSOP-16E, 3x4 DFN-12 |
| LT3028 | 0.1/0.5 | 1.8 | 20 | 1.22 | 0.30 | 60 | Adj (1.22 to 20) | 20 | E I | TSSOP-16E, 3x5 DFN-16 |
| LT3029 | 0.5/0.5 | 1.8 | 20 | 1.215 | 0.30 | 110 | Adj (1.215 to 19.5) | 20 | E I H MP | MSOP-16E, 3x4 DFN-16 |
| LT3030* | 0.75/0.25 | 1.7 | 20 | 1.22 | 0.30 | 195 | Adj (1.22 to 19.5) | 20 | E I H MP | 4x5 QFN-28, TSSOP-20E |
| Dual Output Positive and Negative Linear Regulators | | | | | | | | | | |
| LT3032 | ±0.15 | ±1.8 | ±20 | ±1.22 | 0.30/-0.34 | 60 | Adj, ±3.3, ±5, ±12, ±15 | 20 / 30 | E I MP | 3x4 DFN-14 |

* Power Good

Single Resistor Set, Current Reference-Based NPN/PNP Positive Linear Regulators

Second generation NPN family features:

- Operation Down to 0V Output
- Direct Paralleling to Spread PCB Heat
- Low Noise and Simplicity with a Single Resistor V_{OUT} Set Capability
- Always Operates in Unity-Gain
 - Bandwidth Independent of Output Voltage
 - Output Noise Independent of Output Voltage
 - Load Regulation Independent of Output Voltage

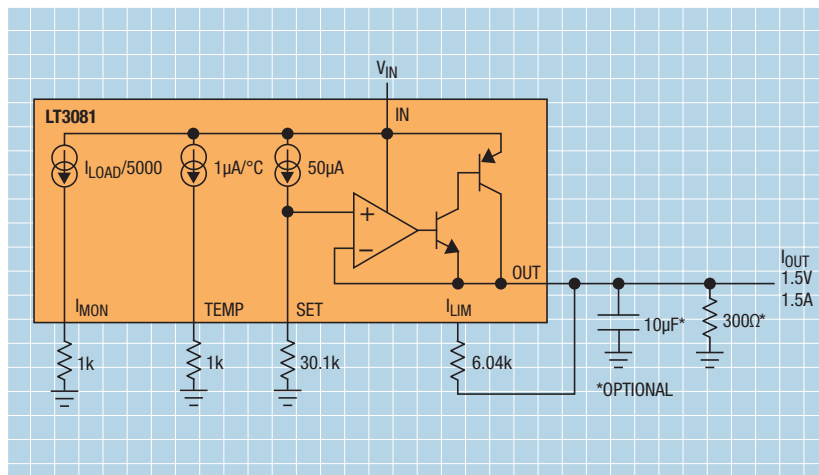


LT3081
Actual Size
Demo Board

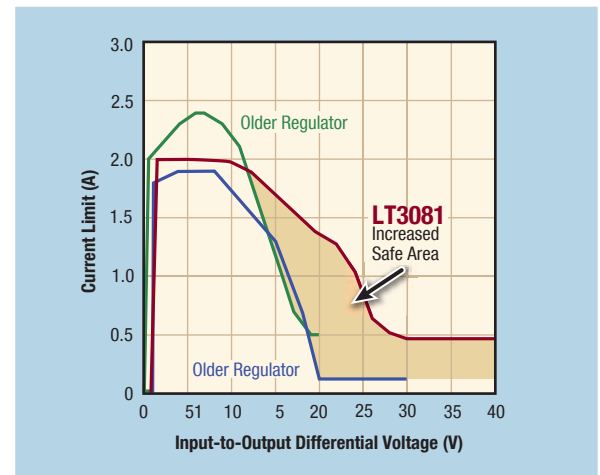


LT3083
Actual Size
Demo Board

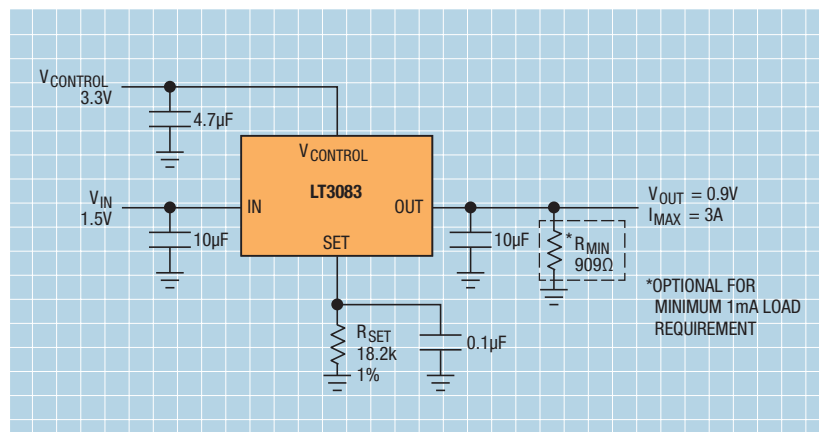
LT3081: 1.5A Single Resistor Rugged Linear Regulator with Monitors



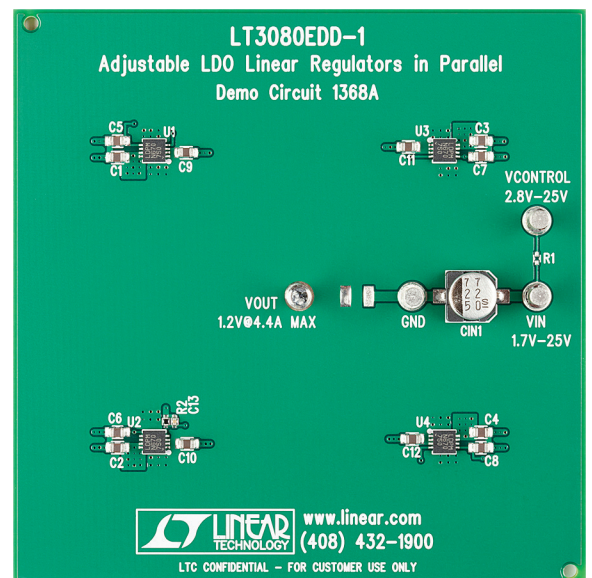
LT3081: Wide Safe Operating Area (SOA)

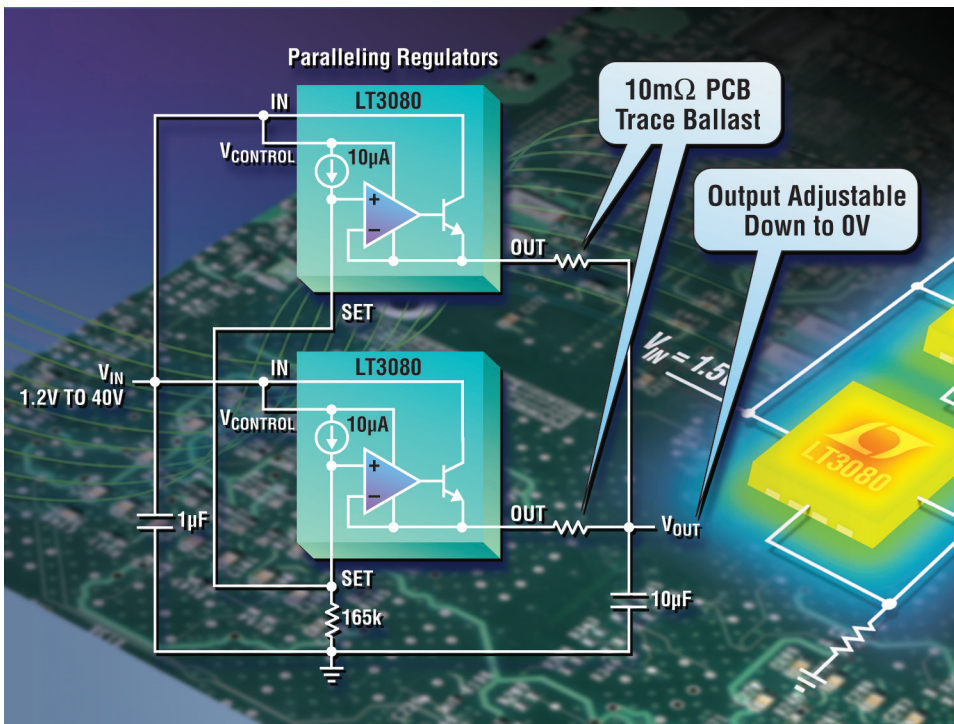


LT3083: Adjustable 3A Single Resistor Low Dropout Regulator



LT3080 Actual Size Demo Board





| Part Number | Output Current (A) | Min V_{IN} (V) | Max V_{IN} (V) | Reference Current (μ A) | Dropout Voltage ($V@I_{OUT}$) | Typ I_Q (Supply) (μ A) | Output Voltage (V) | Noise (μ V _{RMS}) w/ C_{SET} | Temperature Grade | Package |
|---|--------------------|------------------|-------------------|------------------------------|--------------------------------------|-------------------------------|---|---|-------------------|---|
| 0V Output Capable, Single-Resistor Set, Current Reference-Based NPN Positive Linear Regulators | | | | | | | | | | |
| LT3082 § | 0.2 | 1.2 | 40 | 10 | 1.30 | 500 μ A | Adj (0 to 38.5) | 33 | E I MP | 3x3 DFN-8, TSOT-23-8, SOT-223 |
| LT3085 | 0.5 | 1.2 | 36 | 10 | 0.275 [†] | 1mA | Adj (0 to 35.7) | 33 | E I MP | 2x3 DFN-6, MSOP-8E |
| LT3080 | 1.1 | 1.2 | 36 | 10 | 0.35 [†] (1.35, SOT-223) | 1mA | Adj (0 to 35.7) | 40 | E I | 3x3 DFN-8, MSOP-8E, SOT-223, TO-220, DD-Pak |
| LT3080-1* | 1.1 | 1.2 | 36 | 10 | 0.35 [†] | 1mA | Adj (0 to 35.7) | 40 | E I | 3x3 DFN-8, MSOP-8E |
| LT3081#□ | 1.5 | 1.2 | 36 | 50 | 1.23 | 1.1mA | Adj (0 to 34.5) | 40 | E I | 4x4 DFN-12, TSSOP-16E, TO-220, DD-Pak |
| LT3086#§□ | 2.1 | 1.4 | 40 | 50 | 0.33 | 1.2mA | Adj (0.4 to 32) | 40 | E I MP | 4x5 DFN-16, TSSOP-16E, TO-220, DDPak |
| LT3083 | 3 | 1.2 | 8/18 [†] | 50 | 0.31 [†] | 1mA | Adj (0 to 7.5 or 0 to 17.5 [†]) | 40 | E I MP | 4x4 DFN-12, TSSOP-16E, TO-220, DD-Pak |

* Integrated Ballast Resistor † DD-Pak and TO-220 Packages ‡ Dual-Supply Operation #Power Good § PNP pass transistor □ LDO+

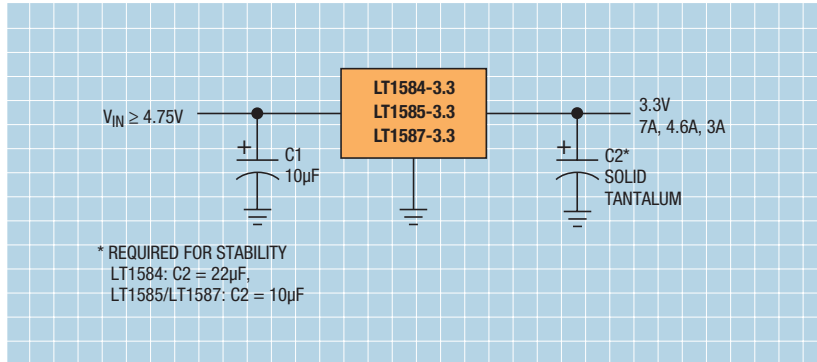
| Part Number | Output Current Range (mA) | Initial Accuracy (%) | Min V_{IN} (V) | Max V_{IN} (V) | Current Regulation (ppm/V) | Quiescent Current (μ A) | Reverse Voltage Protection | Reverse Current Protection | Current Limiting | Thermal Protection | Temperature Grade | Package |
|------------------------|---------------------------|----------------------|------------------|------------------|----------------------------|------------------------------|----------------------------|----------------------------|------------------|--------------------|-------------------|----------------------------|
| Current Sources | | | | | | | | | | | | |
| LM334 | 1 μ A to 10mA | 3 | 0.8 | 40 | 200 | 280 | — | yes | — | — | C | TO-92, S0-8 |
| LT3092 | 0.5 to 200 | 1 | 1.2 | 40 | <10 | 300 | yes | yes | yes | yes | E I MP | TSOT-8, SOT-223, 3x3 DFN-8 |

NPN Positive Linear Regulators

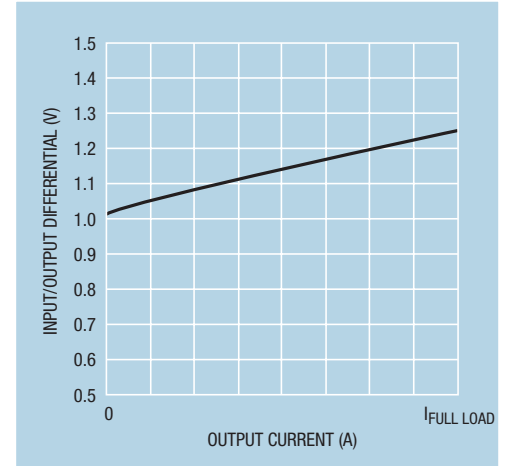
First generation NPN positive linear regulator family:

- Based on Classic 3-Terminal Architecture
- Wide Input Voltage
- Wide Output Voltage

LT[®]1584/5A/7: Low Dropout Fast Response Positive Regulator Adjustable & Fixed



Dropout Voltage vs Output Current



| Part Number | Output Current (A) | Min V_{IN} (V) | Max V_{IN} (V) | Reference Voltage (V) | Dropout Voltage (V@ I_{OUT}) | Typ I_Q (Supply) (mA) | Output Voltage (V) | Noise (μV_{RMS}) or % of V_{OUT} | Temperature Grade | Package |
|---------------------------------------|--------------------|------------------|------------------|-----------------------|---------------------------------|-------------------------|--------------------------------|---|-------------------|-----------------------|
| NPN Positive Linear Regulators | | | | | | | | | | |
| LT1117 | 0.8 | 2.5 | 15 | 1.25 | 1.20 | 5 | Adj, 2.85, 3.3, 5 | 0.003% | C I | DD-Pak, SOT-223 |
| LT1118 | -0.4/0.8 | 3.0 | 15 | 1.225 | 1.00 | 0.6 | Adj, 2.5, 2.85, 5 | - | C | SO-8, SOT-223 |
| LT1086 | 1.5 | 2.6 | 25 | 1.25 | 1.30 | 5 | Adj, 2.85, 3.3, 3.6, 5, 12 | 0.003% | C I | DD-Pak, TO-220 |
| LT1085 | 3 | 2.6 | 30 | 1.25 | 1.30 | 5 | Adj, 3.3, 3.6, 5, 12 | 0.003% | C I | DD-Pak, TO-220, TO-3P |
| LT1587 | 3 | 2.7 | 7 | 1.25 | 1.20 | 8 | Adj, 1.5, 3.3, 3.38, 3.45, 3.6 | 0.003% | C | DD-Pak, TO-220 |
| LT1585 | 4.6 | 2.4 | 7 | 1.25 | 1.10 | 8 | Adj, 1.5, 3.3, 3.38, 3.45, 3.6 | 0.003% | C | DD-Pak, TO-220 |
| LT1585A | 5 | 2.5 | 7 | 1.25 | 1.20 | 8 | Adj, 1.5, 3.3 | 0.003% | C | DD-Pak, TO-220 |
| LT1084 | 5 | 2.6 | 30 | 1.25 | 1.30 | 5 | Adj, 3.3, 3.6, 5, 12 | 0.003% | C I | DD-Pak, TO-220, TO-3P |
| LT1584 | 7 | 2.5 | 7 | 1.25 | 1.25 | 8 | Adj, 3.3, 3.38, 3.45, 3.6 | 0.003% | C I | DD-Pak, TO-220 |
| LT1580 | 7 | 1.8* | 6 | 1.25 | 0.54 [‡] | 10 | Adj, 2.5 | - | C I | DD-Pak, TO-220 |
| LT1083 | 7.5 | 2.6 | 30 | 1.25 | 1.30 | 5 | Adj, 3.3, 3.6, 5, 12 | 0.003% | C | DD-Pak, TO-220 |
| LT1581 | 10 | 1.7* | 6 | 1.25 | 0.43 [‡] | 10 | Adj, 2.5 | - | C | TO-220 |

* Dual-Supply Operation

Very Low Dropout (VLDO) Positive Linear Regulators

VLDO™ regulator family features:

- Input Voltage Operation Down to 0.9V
- Output Voltage Down to 0.2V
- Typical Dropout Performance ≤ 150mV
Enabling low V_{IN} -to- V_{OUT} Differential Applications

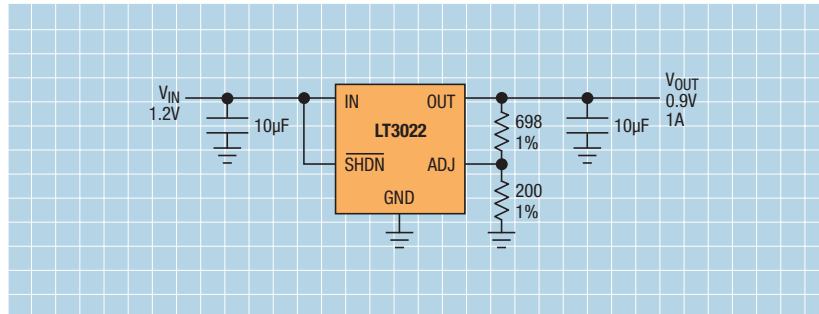


LT3022
Actual Size
Demo Board

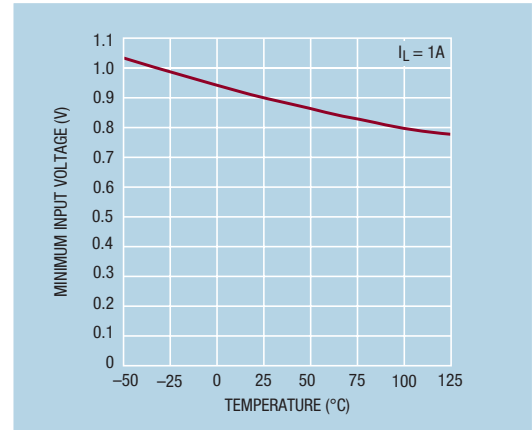


LTC3025-x
Actual Size
Demo Board

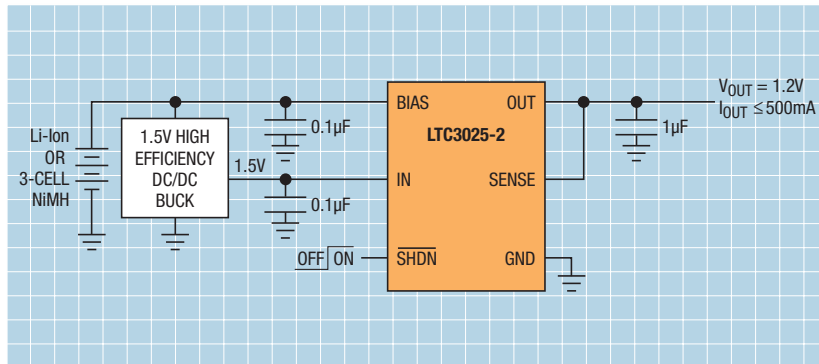
LT3022: 1A, 0.9V to 10V, Very Low Dropout Linear Regulator



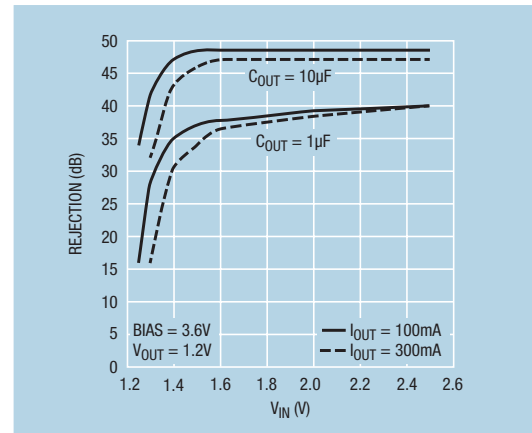
Minimum Input Voltage



LTC®3025-x: 500mA Positive Low Noise LDO Regulator



1MHz V_{IN} Supply Rejection



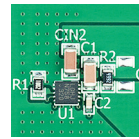
| Part Number | Output Current (A) | Min V_{IN} (V) | Max V_{IN} (V) | Reference Voltage (V) | Dropout Voltage (V@ I_{OUT}) | Typ I_Q (Supply) (µA) | Output Voltage (V) | Noise (μV_{RMS}) or % of V_{OUT} | Temperature Grade | Package |
|--|--------------------|------------------|------------------|-----------------------|---------------------------------|-------------------------|--|---|-------------------|-----------------------|
| VLDO Positive Linear Regulators | | | | | | | | | | |
| LT3020 | 0.1 | 0.9 | 10 | 0.20 | 0.15 | 120 | Adj (0.2 to 9.5), 1.2, 1.5, 1.8 | 245 | E I | MSOP-8, 3x3 DFN-8 |
| LTC1844 | 0.15 | 1.6 | 6.5 | 1.25 | 0.11 | 35 | Adj (1.25 to 6), 1.5, 1.8, 2.5, 2.8, 3.3 | 60 | E | TSOT-5 |
| LTC3025 | 0.3 | 0.9 | 5.5 | 0.40 | 0.045 | 54 | Adj (0.4 to 3.6) | 80 | E | 2x2 DFN-6 |
| LTC3035 | 0.3 | 1.7 | 5.5 | 0.40 | 0.05 | 100 | Adj (0.4 to 3.6) | 150 | E | 2x3 DFN-8 |
| LT3021 | 0.5 | 0.9 | 10 | 0.20 | 0.16 | 120 | Adj (0.2 to 9.5), 1.2, 1.5, 1.8 | 300 | E I | 5x5 DFN-16, SO-8 |
| LTC3025-x | 0.5 | 0.9 | 5.50 | 0.40 | 0.08 | 54 | Adj (0.4 to 3.6), 1.2, 1.5, 1.8 | 80 | E I | 2x2 DFN-6 |
| LT3022 | 1.0 | 0.95 | 10 | 0.20 | 0.15 | 400 | Adj (0.2 to 9.5), 1.2, 1.5, 1.8 | 165 | E I | 3x5 DFN-16, TSSOP-16E |
| LTC3026‡ | 1.5 | 1.14 | 3.5/5.5 | 0.40 | 0.10 | 400# | Adj (0.4 to 2.6) | 110* or 210† | E I | 3x3 DFN-10, MSOP-10E |

* Boost Disabled † Boost Enabled ‡ LDO+ # $V_{IN} = 3.5V$

Negative Linear Regulators

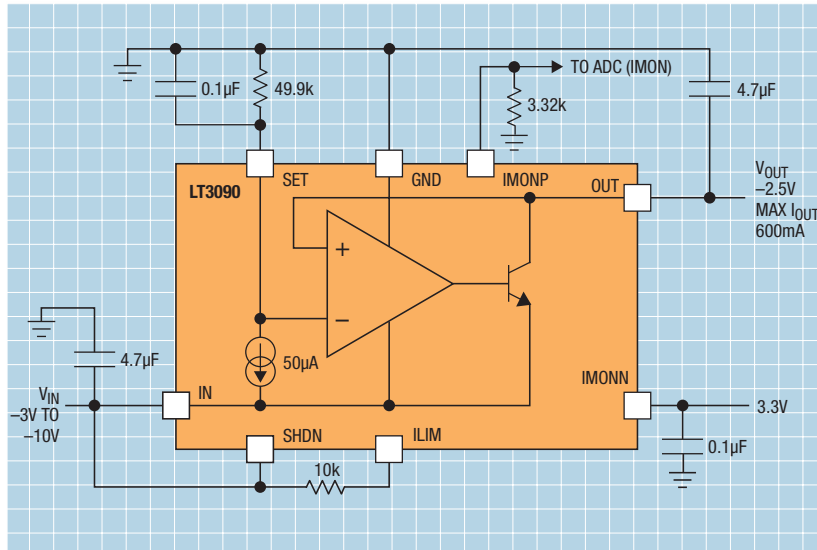
Rugged and hard to kill negative linear regulator family features:

- Low Output Voltage Noise
- Wide Voltage Range
- Low Dropout Voltage
- Reverse Output Protection

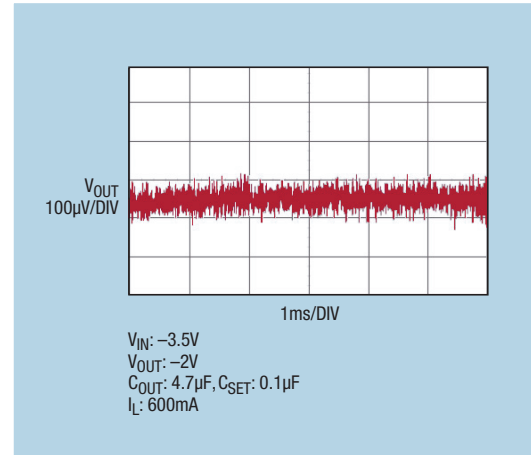


LT3090
Actual Size
Demo Board

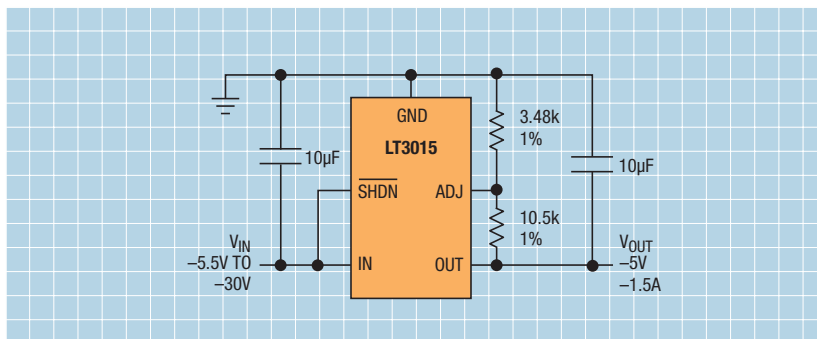
LT3090: 36V, 600mA Negative Linear Regulator with Programmable Current Limit



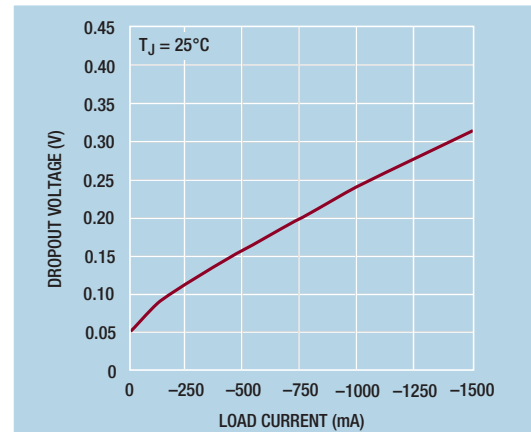
Output Noise: 10Hz to 100kHz



LT3015: 1.5A, Low Noise, Negative LDO Regulator with Precision Current Limit



Dropout Voltage



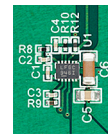
| Part Number | Output Current (A) | Min V_{IN} (V) | Max V_{IN} (V) | Reference Voltage (V) | Dropout Voltage ($V@I_{OUT}$) | Typ I_o (Supply) (μ A) | Output Voltage (V) | Noise (μ V _{RMS}) or % of V_{OUT} | Temperature Grade | Package |
|--|--------------------|------------------|------------------|-----------------------|---------------------------------|-------------------------------|---|--|-------------------|--------------------------------------|
| Negative Linear Regulators | | | | | | | | | | |
| LT1964 | 0.2 | -1.9 | -20 | -1.22 | 0.34 | 30 | Adj, -5 | 30 | E I | TSOT-5, 3x3 DFN-8 |
| LT1175 | 0.5 | -4.3 | -20 | -3.8 | 0.50 | 45 | Adj, -5 | 134 | C I MP | SOT-223, SO-8, DIP-8, DD-Pak, TO-220 |
| LT3090* | 0.6 | -1.5 | -36 | 50 μ A | 0.30 | 1mA | Adj (0 to -32) | 18 | E I H MP | 3x3 DFN-12, MSOP-12E |
| LT3015 | 1.5 | -1.8 | -30 | -1.22 | 0.31 | 1.1mA | Adj (-1.22 to -30) | 60 | E I MP | DD-Pak, TO-220, MSOP-12E, 3x3 DFN-8 |
| LT1185 | 3.0 | -4.3 | -35 | -2.37 | 0.67 | 2.5mA | Adj (-2.37 to -30) | 49 | C I | DD-Pak, TO-220 |
| Dual Output Positive and Negative Linear Regulators | | | | | | | | | | |
| LT3032 | \pm 0.15 | \pm 1.9 | \pm 20 | \pm 1.22 | 0.30/-0.34 | 55 | Adj, \pm 3.3, \pm 5, \pm 12, \pm 15 | 20 / 30 | E I MP | 3x4 DFN-14 |

* LDO+

Linear Regulator Controllers

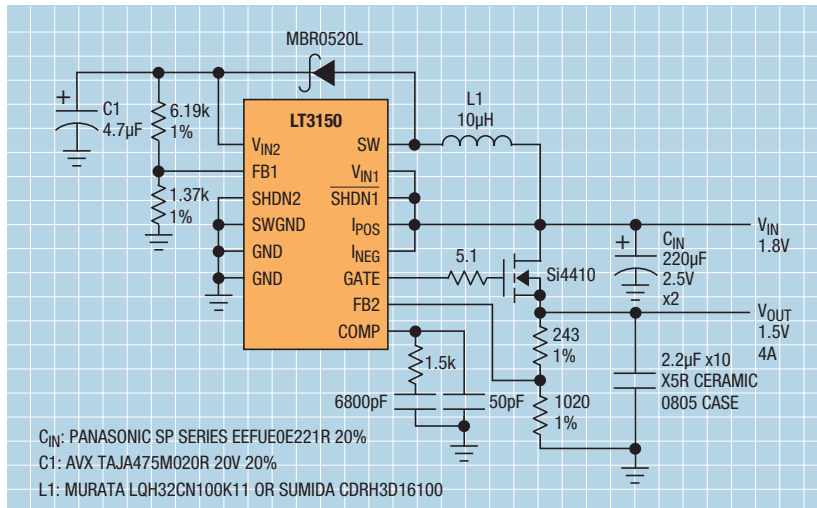
Linear regulator controller family features:

- An Off-Board Power Device
- Reduced On-Chip Power Dissipation
- Spreads Heat More Evenly on a PC Board

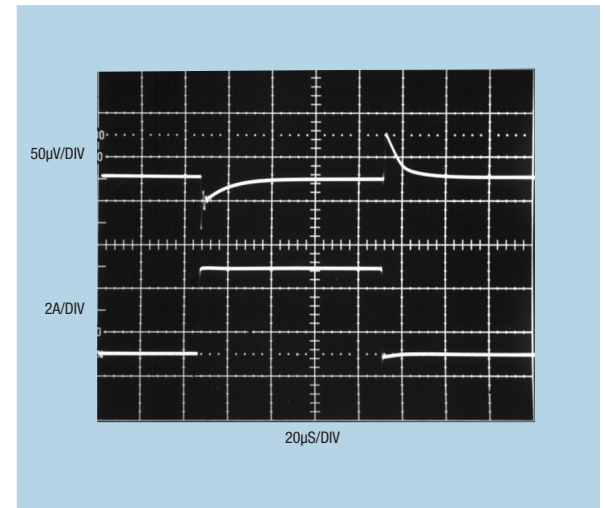


LT3150
Actual Size
Demo Board

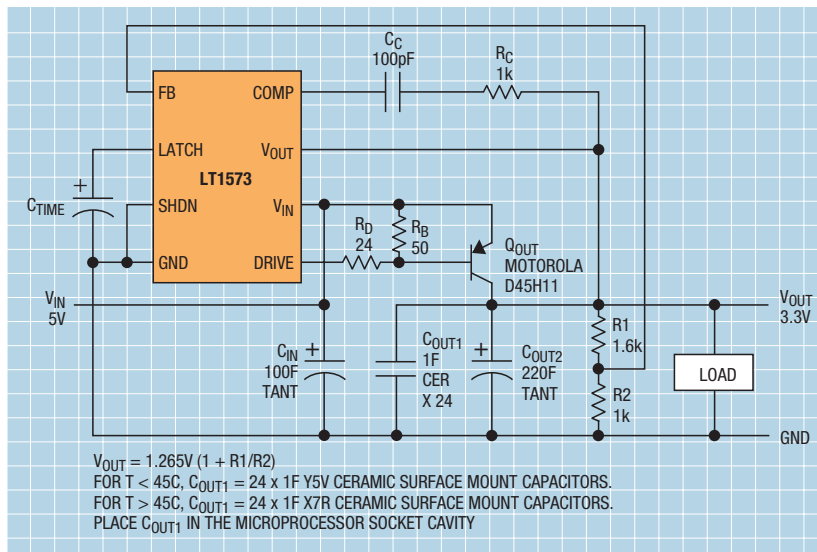
LT3150: Fast Transient Response, Low Input Voltage, LDO Controller



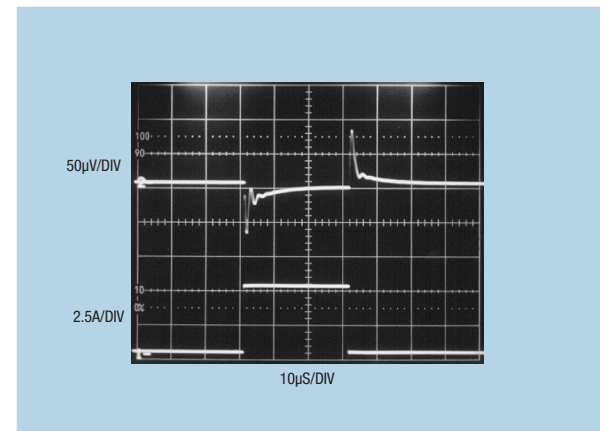
Transient Response for 0.1A to 4A Output Load Step



LT1573: Low Dropout Regulator Controller



Transient Response for 0.2A to 5A Output Load Step



| Part Number | Output Current (A) | Min V_{IN} (V) | Max V_{IN} (V) | Reference Voltage (V) | Dropout Voltage ($V@I_{OUT}$) | Typ I_Q (Supply) (μA) | Output Voltage (V) | Noise (μV_{RMS}) or % of V_{OUT} | Temperature Grade | Package |
|--|--------------------|------------------|------------------|-----------------------|---------------------------------|--------------------------------|-----------------------|---|-------------------|----------------|
| Discrete Pass Element Drivers and Regulators—Very Low Dropout | | | | | | | | | | |
| LT1123 | 3 | n/a | 30 | 5 | —* | 700 | 5 | — | C | SOT-223, T0-92 |
| LT1573 | 5* | 2.8 | 10 | 1.265 | —* | 1.7mA | Adj, 2.5, 2.8, 3.3 | — | C I | SO-8 |
| LT3150 | 10* | 1.4 | 10 | 1.23 | 0.13 | 12mA | Adj | — | C | SSOP-16 |
| LT1575 | —* | n/a | 22 | 1.21 | —* | 12mA | Adj, 1.5, 2.8, 3.3, 5 | — | C | DIP-8, SO-8 |
| LT1577 | —* | n/a | 22 | 1.21 | —* | 12mA | Adj, 2.8, 3.3 | — | C | SO-16 |

* Depends On Selection of External Pass Device

Radiation Hardened (RH) Linear Regulators

Linear Technology manufactures a broad range of rugged radiation tolerant (rad hard) voltage regulators that are ideal for space and military applications. We also partner with several outside vendors to provide monolithic packaged and hybrid products of Linear Technology RH DICE.

| Part Number | Polarity | Output Current (A) | Max. V_{IN} (V) | Reference Voltage (Adj.) | Package |
|---|----------|--------------------|-------------------|--------------------------|-------------------|
| Radiation Hardened (Rad Hard or RH) Linear Regulators | | | | | |
| RH1084 | Positive | 5 | 25 | 1.25V | T0-3 |
| RH1086M | Positive | 0.5/1.5 | 25 | 1.25V | Dice, T0-3, T0-39 |
| RH117 | Positive | 0.5/1.5 | 40 | 1.25V | Dice, T0-3, T0-39 |
| RH137 | Negative | 1.5 | -30 | -1.25V | Dice, T0-3, T0-39 |
| RH1573 | Positive | 5 | 10 | 1.265V | Dice |
| RH1185 | Negative | 3 | -35 | -2.37V | Dice |
| RH3080* | Positive | 1 | 35 | 10 μ A | Dice |
| RH3083* | Positive | 3 | 23 | 50 μ A | Dice |

* Current Source Reference

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Todd Owen and Jim Williams, *Performance Verification of Low Noise, Low Dropout Regulators*,

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Linear Technology Corporation, Application Note 69, September 1996

(see Appendix A, Using PCB Material as Low Value Resistors).

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Application Note 1040/D, May 2001.

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Linear Technology Corporation, Linear Technology Magazine, May 2005.

LT1963A 1.5A, *Low Noise, Fast Transient Response LDO Regulator* data sheet,

Linear Technology Corporation.

All reference materials listed above are available at www.linear.com

Videos / Video Product Briefs

LT3009 LT3015 LT3070/71 LT3080 LT3081 LT3086 LT3090 LT3092

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