

3A LOW DROPOUT POSITIVE REGULATOR

Features

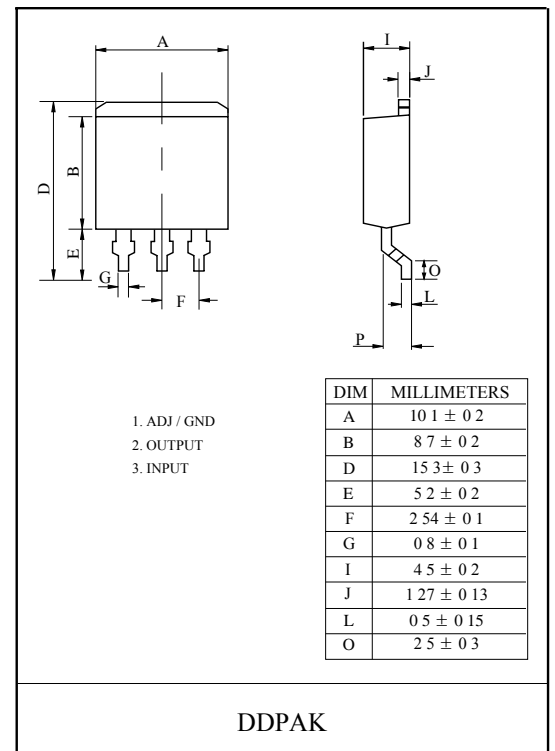
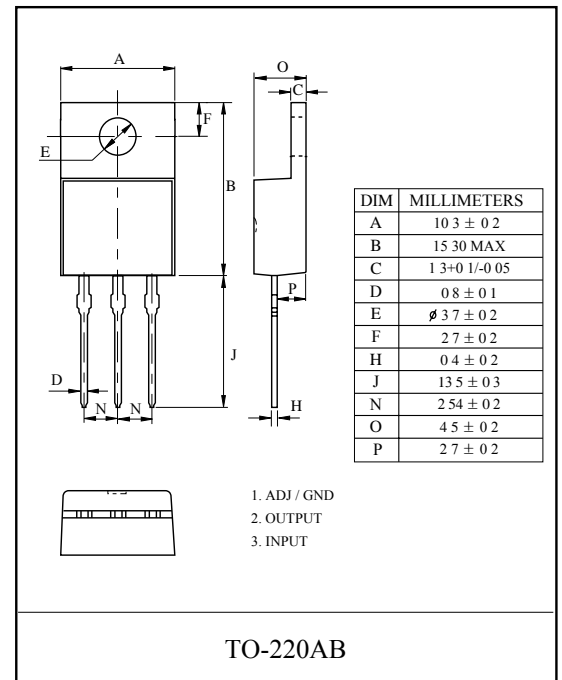
- Output Current : 3A
- Maximum Input Voltage : 7V
- Adjustable Output Voltage or Fixed
- 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 3.6V, 5.0V
- Current Limiting and Thermal Protection
- Standard 3-Pin Power Packages

Application

- Post Regulator for Switching DC/DC Converter
- High Efficiency Linear Regulators
- Battery Charger

Absolute Maximum Ratings

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|----------|------------------|-------------|------|
| DC Input Voltage | | VI | 7 | V |
| Storage Temperature Range | | T _{stg} | -65 to +150 | °C |
| Operating Junction Temperature Range (Note 3) | | Top | -10 to +125 | °C |
| Thermal | TO-220AB | θ _{jc} | 3 | °C/W |
| | DDPAK | | 3 | |
| | TO-220AB | θ _{ja} | 50 | °C/W |
| | DDPAK | | 62.5 | |





FR1085P/DD

Electrical Characteristics

Typicals and limits appearing in normal type apply for Tj= +25°C.

Limits appearing in Boldface type apply over the entire junction temperature range for operation.

| Symbol | Parameter | Conditions | Min (Note 5) | Typ (Note 4) | Max (Note 5) | Units |
|------------------|---|--|-----------------|-----------------|-----------------|-------|
| V _{OUT} | Output Voltage (Note 6) FR1085-Adj | I _{OUT} =10mA, V _{IN} =4.25V | 1.237 | 1.250 | 1.263 | |
| | | 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 2.75V ≤ V _{IN} ≤ 7.0V | 1.232 | 1.250 | 1.268 | |
| | | | 1.225 | 1.250 | 1.275 | |
| | FR1085-1.5 | I _{OUT} =10mA, V _{IN} =4.25V | 1.485 | 1.500 | 1.515 | |
| | | 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 3.0V ≤ V _{IN} ≤ 7.0V | 1.478 | 1.500 | 1.522 | |
| | | | 1.470 | 1.500 | 1.530 | |
| | FR1085-1.8 | I _{OUT} =10mA, V _{IN} =4.25V | 1.782 | 1.800 | 1.818 | |
| | | 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 3.3V ≤ V _{IN} ≤ 7.0V | 1.773 | 1.800 | 1.827 | |
| | | | 1.764 | 1.800 | 1.836 | |
| | FR1085-2.5 | I _{OUT} =10mA, V _{IN} =4.25V | 2.475 | 2.500 | 2.525 | |
| | | 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 4.0V ≤ V _{IN} ≤ 7.0V | 2.463 | 2.500 | 2.537 | |
| | | | 2.450 | 2.500 | 2.550 | |
| | FR1085-2.85 | I _{OUT} =10mA, V _{IN} =4.25V | 2.820 | 2.850 | 2.880 | |
| | | 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 4.35V ≤ V _{IN} ≤ 7.0V | 2.805 | 2.850 | 2.895 | |
| | | | 2.790 | 2.850 | 2.910 | |
| | FR1085-3.3 | I _{OUT} =10mA, V _{IN} =4.25V | 3.270 | 3.300 | 3.330 | |
| | | 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 4.8V ≤ V _{IN} ≤ 7.0V | 3.250 | 3.300 | 3.350 | |
| | | | 3.235 | 3.300 | 3.365 | |
| FR1085-3.6 | I _{OUT} =10mA, V _{IN} =4.25V | 3.564 | 3.600 | 3.636 | | |
| | 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 5.1V ≤ V _{IN} ≤ 7.0V | 3.546 | 3.600 | 3.654 | | |
| | | 3.528 | 3.600 | 3.672 | | |
| FR1085-5.0 | I _{OUT} =10mA, V _{IN} =4.25V | 4.950 | 5.000 | 5.050 | | |
| | 0 ≤ I _{OUT} ≤ I _{FULL LOAD} , 6.5V ≤ V _{IN} ≤ 7.0V | 4.925 | 5.000 | 5.075 | | |
| | | 4.900 | 5.000 | 5.100 | | |



Electrical Characteristics

Typicals and limits appearing in normal type apply for $T_j = +25^\circ\text{C}$.

Limits appearing in **Boldface** type apply over the entire junction temperature range for operation.

| | | | | | | |
|------------------|--|--|-----|------------|------------|---------------|
| ΔV_{OUT} | Line Regulation (Note 7) | | | | 0.3 | % |
| | FR1085-Adj | $I_{OUT}=10\text{mA}, 2.75\text{V} \leq V_{IN} \leq 7.0\text{V}$ | - | - | 0.4 | |
| | FR1085-1.5 | $I_{OUT}=10\text{mA}, 3.0\text{V} \leq V_{IN} \leq 7.0\text{V}$ | - | - | 6 | mV |
| | FR1085-1.8 | $I_{OUT}=10\text{mA}, 3.3\text{V} \leq V_{IN} \leq 7.0\text{V}$ | - | - | 6 | |
| | FR1085-2.5 | $I_{OUT}=10\text{mA}, 4.0\text{V} \leq V_{IN} \leq 7.0\text{V}$ | - | - | 6 | |
| | FR1085-2.85 | $I_{OUT}=10\text{mA}, 4.35\text{V} \leq V_{IN} \leq 7.0\text{V}$ | - | - | 6 | |
| | FR1085-3.3 | $I_{OUT}=10\text{mA}, 4.8\text{V} \leq V_{IN} \leq 7.0\text{V}$ | - | - | 6 | |
| | FR1085-3.6 | $I_{OUT}=10\text{mA}, 5.1\text{V} \leq V_{IN} \leq 7.0\text{V}$ | - | - | 6 | |
| | FR1085-5.0 | $I_{OUT}=10\text{mA}, 6.5\text{V} \leq V_{IN} \leq 7.0\text{V}$ | - | - | 6 | |
| ΔV_{OUT} | Load Regulation (Note 7) | | | | 0.3 | % |
| | FR1085-Adj | $V_{IN}=4.25\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$ | - | - | 0.4 | |
| | FR1085-1.5 | $V_{IN}=5.0\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$ | - | - | 12 | mV |
| | FR1085-1.8 | $V_{IN}=5.0\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$ | - | - | 20 | |
| | FR1085-2.5 | $V_{IN}=5.0\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$ | - | - | 15 | |
| | FR1085-3.3 | $V_{IN}=5.0\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$ | - | - | 20 | |
| | FR1085-3.6 | $V_{IN}=5.3\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$ | - | - | 15 | |
| FR1085-5.0 | $V_{IN}=7.0\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$ | - | - | 25 | | |
| ΔV | Dropout Voltage (Note 8) | $\Delta V_{REF}=1\%, I_{OUT}=3\text{A}$ | - | - | 1.5 | V |
| $I_{O(MIN)}$ | Minimum Load Current | $V_{IN}=7.0\text{V}$ | - | - | 10 | mA |
| I_{LIMIT} | Current Limit | $V_{IN}=V_{out}+2\text{V}$ | 3.5 | - | - | A |
| I_{ADJ} | Adjust Pin Current | $V_{IN}=2.75+7.0\text{V}, I_{OUT}=10\text{mA}$ | - | - | 120 | μA |
| ΔI_{ADJ} | Adjust Pin Current Change | $I_{OUT}=10\text{mA}+3\text{A}, V_{IN}=2.75+7.0\text{V}$ | - | - | 5 | μA |
| RR | Ripple Rejection | $f_{RIPPLE} = 120\text{Hz}, C_{OUT}=25\mu\text{F}$ Tantalum, $I_{out}=3\text{A}; V_{IN}=V_{out}+2\text{V}$ | 60 | - | - | dB |
| S | Temperature Stability | | - | 0.5 | - | % |

NOTES 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Rating indicate conditions for which the device is intended to be functional, but specific performance is not guaranteed. For guaranteed specifications and the test conditions, see the Electrical Characteristics.

NOTES 2: Power Dissipation is kept in a safe range by current limiting circuitry. Refer to Overload Recovery in Application Notes.

NOTES 3: The maximum power dissipation is a function of $T_j (MAX)$, Θ_{JA} and T_A . The maximum allowable power dissipation at any ambient temperature is $P_D=(T_j(MAX) - T_A)\Theta_{JA}$.

NOTES 4: Typical Values represent the most likely parametric norm

NOTES 5: All limits are guaranteed by testing or statistical analysis

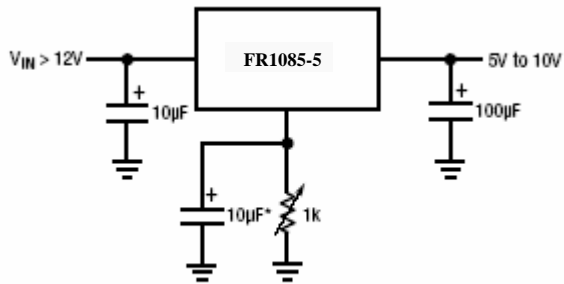
NOTES 6: $I_{FULL\ LOAD}$ is defined in the current limit curves. The $I_{FULL\ LOAD}$ curve defines the current limit as a function of input-to-output voltage.

NOTES 7: Load and Line regulation are measured at constant junction temperature, and are guaranteed up to the maximum power dissipation of 30W. Power dissipation is determined by the input/output differential and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.

NOTES 8: Dropout voltage is specified over the full output current range of the device.

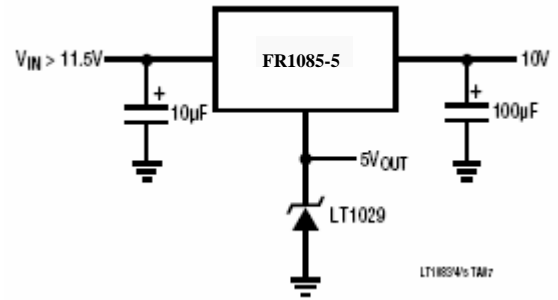
Typical Applications

Adjusting Output Voltage

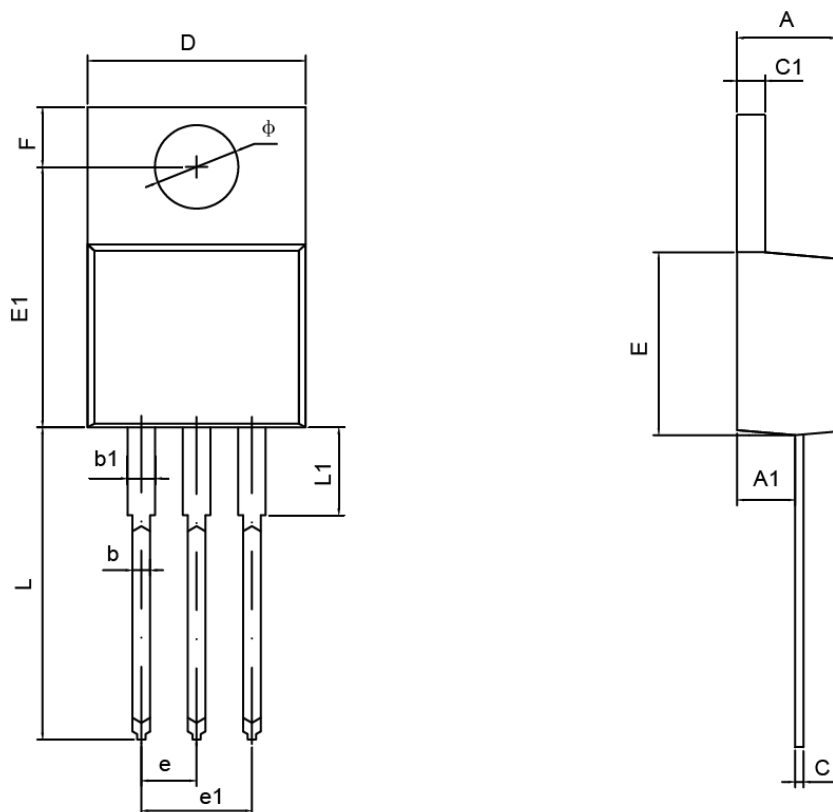


OPTIONAL IMPROVES RIPPLE REJECTION

Regulator with Reference

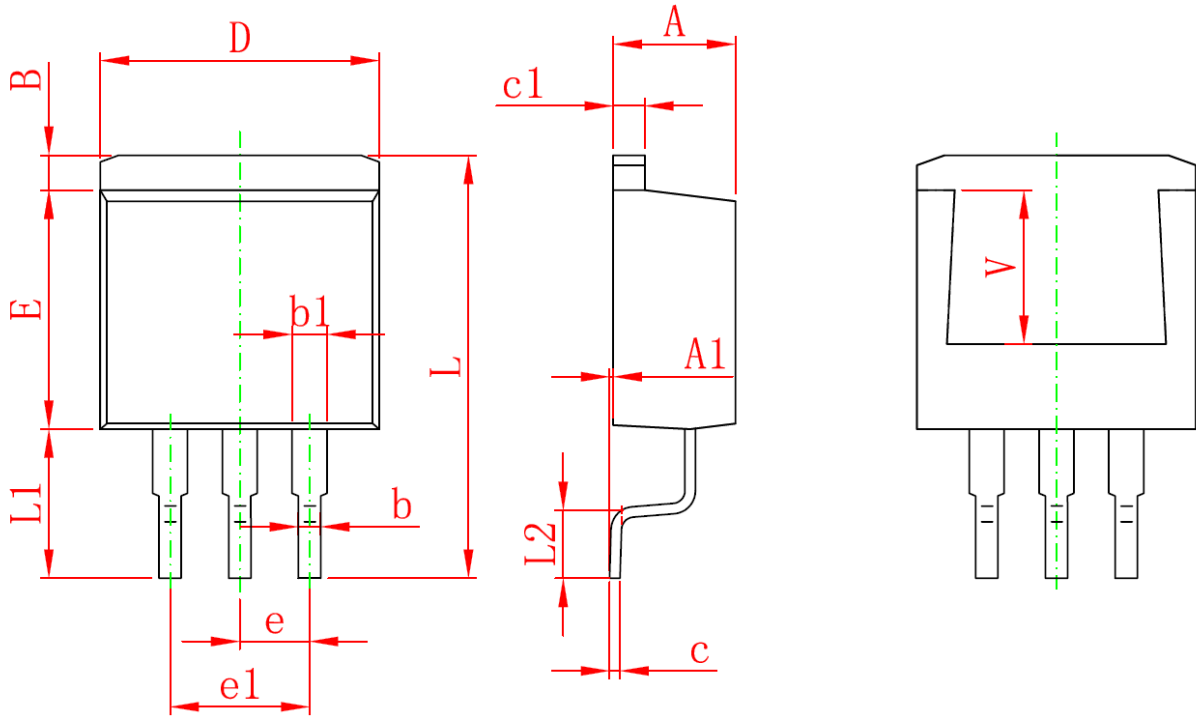


TO-220-3L PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.470 | 4.670 | 1.176 | 0.184 |
| A1 | 2.520 | 2.820 | 0.099 | 0.111 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.310 | 0.530 | 0.012 | 0.021 |
| c1 | 1.710 | 1.370 | 0.046 | 0.054 |
| D | 10.010 | 10.310 | 0.394 | 0.406 |
| E | 8.500 | 8.900 | 0.335 | 0.350 |
| E1 | 12.060 | 12.460 | 0.475 | 0.491 |
| e | 2.540TYP | | 0.100TYP | |
| e1 | 4.980 | 5.180 | 0.196 | 0.204 |
| F | 2.590 | 2.890 | 0.102 | 0.114 |
| L | 13.400 | 13.800 | 0.528 | 0.543 |
| L1 | 3.560 | 3.960 | 0.140 | 0.156 |
| ϕ | 3.790 | 3.890 | 0.149 | 0.153 |

TO-263-3L PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.470 | 4.670 | 0.176 | 0.184 |
| A1 | 0.000 | 0.150 | 0.000 | 0.006 |
| B | 1.170 | 1.370 | 0.046 | 0.054 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.310 | 0.530 | 0.012 | 0.021 |
| c1 | 1.170 | 1.370 | 0.046 | 0.054 |
| D | 10.010 | 10.310 | 0.394 | 0.406 |
| E | 8.500 | 8.900 | 0.335 | 0.350 |
| e | 2.540 TYP | | 0.100 TYP | |
| e1 | 4.980 | 5.180 | 0.196 | 0.204 |
| L | 15.050 | 15.450 | 0.593 | 0.608 |
| L1 | 5.080 | 5.480 | 0.200 | 0.216 |
| L2 | 2.340 | 2.740 | 0.092 | 0.108 |
| V | 5.600 REF | | 0.220 REF | |