

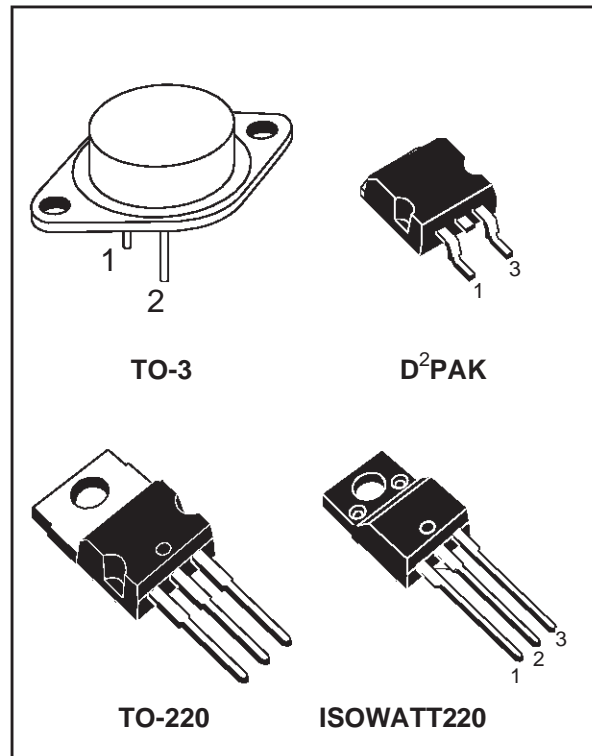


NEGATIVE VOLTAGE REGULATORS

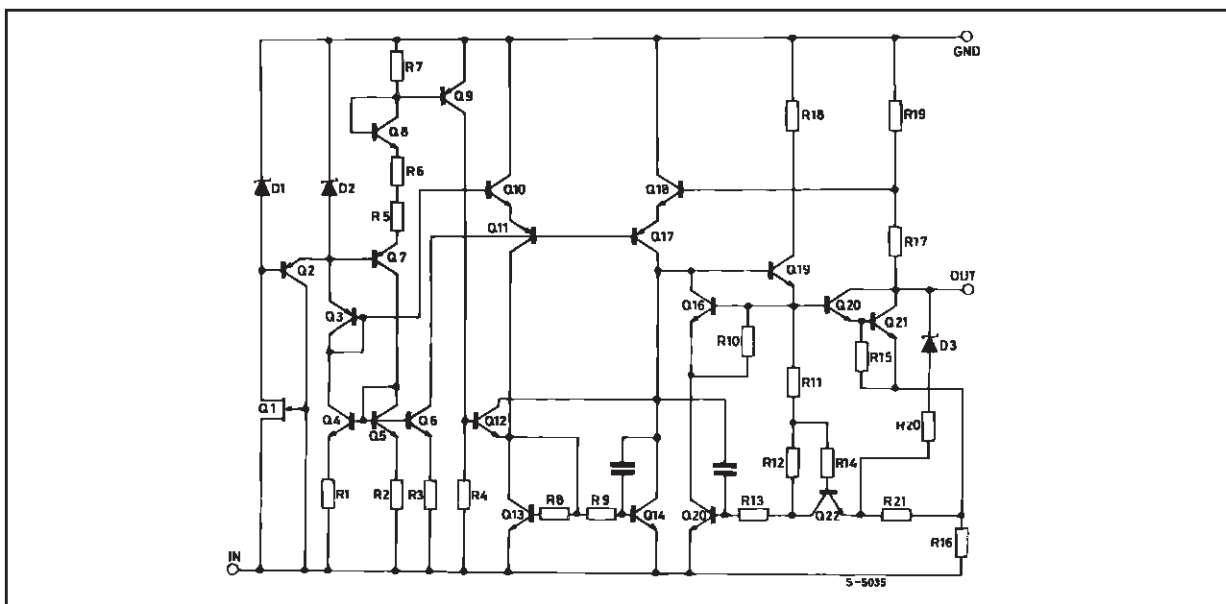
- OUTPUT CURRENT UP TO 1.5 A
- OUTPUT VOLTAGES OF -5; -5.2; -6; -8; -9; -12; -15; -18; -20; -22; -24V
- THERMAL OVERLOAD PROTECTION
- SHORT CIRCUIT PROTECTION
- OUTPUT TRANSITION SOA PROTECTION

DESCRIPTION

The L7900 series of three-terminal negative regulators is available in TO-220, ISOWATT220 TO-3 and D²PAK packages and several fixed output voltages, making it useful in a wide range of applications. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation; furthermore, having the same voltage option as the L7800 positive standard series, they are particularly suited for split power supplies. In addition, the -5.2V is also available for ECL system. If adequate heat sinking is provided, they can deliver over 1.5A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.



SCHEMATIC DIAGRAM



L7900

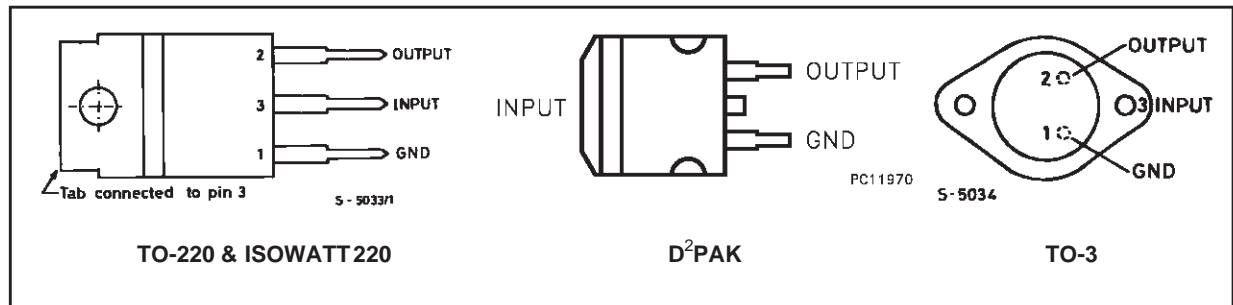
ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|-----------|---|--------------------|--------|
| V_i | DC Input Voltage (for $V_o = 5$ to 18V) (for $V_o = 20, 24V$) | -35 -40 | V V |
| I_o | Output Current | Internally limited | |
| P_{tot} | Power Dissipation | Internally limited | |
| T_{op} | Operating Junction Temperature Range | 0 to 150 | °C |
| T_{stg} | Storage Temperature Range | - 65 to 150 | °C |

THERMAL DATA

| Symbol | Parameter | D ² PAK | TO-220 | ISOWATT220 | TO-3 | Unit |
|----------------|---|--------------------|--------|------------|------|------|
| $R_{thj-case}$ | Thermal Resistance Junction-case Max | 3 | 3 | 4 | 4 | °C/W |
| $R_{thj-amb}$ | Thermal Resistance Junction-ambient Max | 62.5 | 50 | 60 | 35 | °C/W |

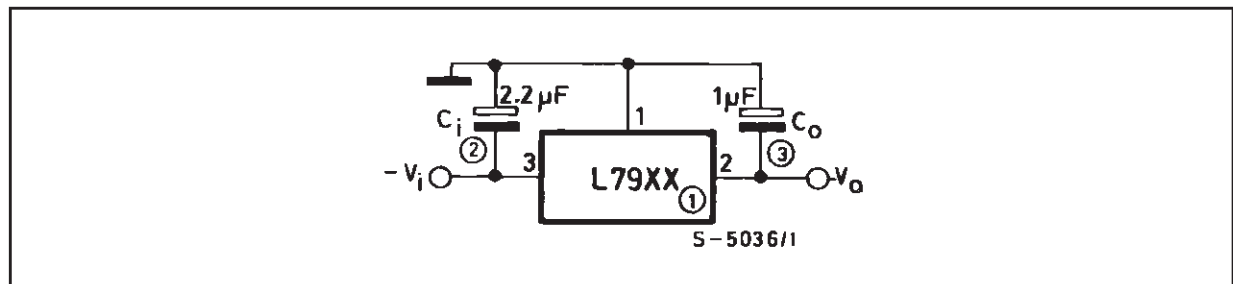
CONNECTION DIAGRAM AND ORDERING NUMBERS (top view)



| Type | TO-220 | D ² PAK (*) | ISOWATT220 | TO-3 | Output Voltage |
|--------|---------|------------------------|------------|---------|----------------|
| L7905C | L7905CV | L7905CD2T | L7905CP | L7905CT | -5V |
| L7952C | L7952CV | L7952CD2T | | L7952CT | -5.2V |
| L7906C | L7906CV | L7906CD2T | L7906CP | L7906CT | -6V |
| L7908C | L7908CV | L7908CD2T | L7908CP | L7908CT | -8V |
| L7912C | L7912CV | L7912CD2T | L7912CP | L7912CT | -12V |
| L7915C | L7915CV | L7915CD2T | L7915CP | L7915CT | -15V |
| L7918C | L7918CV | L7918CD2T | L7918CP | L7918CT | -18V |
| L7920C | L7920CV | L7920CD2T | L7920CP | L7920CT | -20V |
| L7922C | L7922CV | L7922CD2T | | L7922CT | -22V |
| L7924C | L7924CV | L7924CD2T | L7924CP | L7924CT | -24V |

(*) AVAILABLE IN TAPE AND REEL WITH "-TR" SUFFIX

APPLICATION CIRCUIT



ELECTRICAL CHARACTERISTICS FOR L7905C (refer to the test circuits, $T_j = 0$ to 150 °C, $V_i = -10V$, $I_o = 500$ mA, $C_i = 2.2$ μ F, $C_o = 1$ μ F unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|---|-------|------|-----------|----------|
| V_o | Output Voltage | $T_j = 25$ °C | -4.8 | -5 | -5.2 | V |
| V_o | Output Voltage | $I_o = -5$ mA to -1 A $P_o \leq 15$ W $V_i = 8$ to 20 V | -4.75 | -5 | -5.25 | V |
| ΔV_o^* | Line Regulation | $V_i = -7$ to -25 V $T_j = 25$ °C $V_i = -8$ to -12 V $T_j = 25$ °C | | | 100 50 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5$ to 1500 mA $T_j = 25$ °C $I_o = 250$ to 750 mA $T_j = 25$ °C | | | 100 50 | mV mV |
| I_d | Quiescent Current | $T_j = 25$ °C | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5$ to 1000 mA | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -8$ to -25 V | | | 1.3 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5$ mA | | -0.4 | | mV/°C |
| e_N | Output Noise Voltage | B = 10 Hz to 100 KHz $T_j = 25$ °C | | 100 | | μ V |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10$ V $f = 120$ Hz | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1$ A $T_j = 25$ °C $\Delta V_o = 100$ mV | | 1.4 | | V |
| I_{sc} | Short Circuit Current | | | 2.1 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25$ °C | | 2.5 | | A |

ELECTRICAL CHARACTERISTICS FOR L7952C (refer to the test circuits, $T_j = 0$ to 150 °C, $V_i = -10V$, $I_o = 500$ mA, $C_i = 2.2$ μ F, $C_o = 1$ μ F unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|---|-------|------|-----------|----------|
| V_o | Output Voltage | $T_j = 25$ °C | -5.0 | -5.2 | -5.4 | V |
| V_o | Output Voltage | $I_o = -5$ mA to -1 A $P_o \leq 15$ W $V_i = -9$ to -21 V | -4.95 | -5.2 | -5.45 | V |
| ΔV_o^* | Line Regulation | $V_i = -8$ to -25 V $T_j = 25$ °C $V_i = -9$ to -12 V $T_j = 25$ °C | | | 105 52 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5$ to 1500 mA $T_j = 25$ °C $I_o = 250$ to 750 mA $T_j = 25$ °C | | | 105 52 | mV mV |
| I_d | Quiescent Current | $T_j = 25$ °C | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5$ to 1000 mA | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -9$ to -25 V | | | 1.3 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5$ mA | | -0.5 | | mV/°C |
| e_N | Output Noise Voltage | B = 10 Hz to 100 KHz $T_j = 25$ °C | | 125 | | μ V |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10$ V $f = 120$ Hz | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1$ A $T_j = 25$ °C $\Delta V_o = 100$ mV | | 1.4 | | V |
| I_{sc} | Short Circuit Current | | | 2 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25$ °C | | 2.5 | | A |

* Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

ELECTRICAL CHARACTERISTICS FOR L7906C (refer to the test circuits, $T_j = 0$ to $150\text{ }^\circ\text{C}$,
 $V_i = -11\text{V}$, $I_o = 500\text{ mA}$, $C_i = 2.2\text{ }\mu\text{F}$, $C_o = 1\text{ }\mu\text{F}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|---|-------|------|-----------|----------------------|
| V_o | Output Voltage | $T_j = 25\text{ }^\circ\text{C}$ | -5.75 | -6 | -6.25 | V |
| V_o | Output Voltage | $I_o = -5\text{ mA to } -1\text{ A}$ $P_o \leq 15\text{ W}$ $V_i = -9.5\text{ to } -21.5\text{ V}$ | -5.7 | -6 | -6.3 | V |
| ΔV_o^* | Line Regulation | $V_i = -8.5\text{ to } -25\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ $V_i = -9\text{ to } -15\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ | | | 120 60 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5\text{ to } 1500\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$ $I_o = 250\text{ to } 750\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$ | | | 120 60 | mV mV |
| I_d | Quiescent Current | $T_j = 25\text{ }^\circ\text{C}$ | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5\text{ to } 1000\text{ mA}$ | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -9.5\text{ to } -25\text{ V}$ | | | 1.3 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5\text{ mA}$ | | -0.6 | | mV/ $^\circ\text{C}$ |
| e_N | Output Noise Voltage | $B = 10\text{Hz to } 100\text{kHz}$ $T_j = 25\text{ }^\circ\text{C}$ | | 144 | | μV |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10\text{ V}$ $f = 120\text{ Hz}$ | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1\text{ A}$ $T_j = 25\text{ }^\circ\text{C}$ $\Delta V_o = 100\text{ mV}$ | | 1.4 | | V |
| I_{sc} | Short Circuit Current | | | 2 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25\text{ }^\circ\text{C}$ | | 2.5 | | A |

ELECTRICAL CHARACTERISTICS FOR L7908C (refer to the test circuits, $T_j = 0$ to $150\text{ }^\circ\text{C}$,
 $V_i = -14\text{V}$, $I_o = 500\text{ mA}$, $C_i = 2.2\text{ }\mu\text{F}$, $C_o = 1\text{ }\mu\text{F}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|--|------|------|-----------|----------------------|
| V_o | Output Voltage | $T_j = 25\text{ }^\circ\text{C}$ | -7.7 | -8 | -8.3 | V |
| V_o | Output Voltage | $I_o = -5\text{ mA to } -1\text{ A}$ $P_o \leq 15\text{ W}$ $V_i = -11.5\text{ to } -23\text{ V}$ | -7.6 | -8 | -8.4 | V |
| ΔV_o^* | Line Regulation | $V_i = -10.5\text{ to } -25\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ $V_i = -11\text{ to } -17\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ | | | 160 80 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5\text{ to } 1500\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$ $I_o = 250\text{ to } 750\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$ | | | 160 80 | mV mV |
| I_d | Quiescent Current | $T_j = 25\text{ }^\circ\text{C}$ | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5\text{ to } 1000\text{ mA}$ | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -11.5\text{ to } -25\text{ V}$ | | | 1.3 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5\text{ mA}$ | | -0.6 | | mV/ $^\circ\text{C}$ |
| e_N | Output Noise Voltage | $B = 10\text{Hz to } 100\text{kHz}$ $T_j = 25\text{ }^\circ\text{C}$ | | 175 | | μV |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10\text{ V}$ $f = 120\text{ Hz}$ | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1\text{ A}$ $T_j = 25\text{ }^\circ\text{C}$ $\Delta V_o = 100\text{ mV}$ | | 1.1 | | V |
| I_{sc} | Short Circuit Current | | | 1.5 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25\text{ }^\circ\text{C}$ | | 2.5 | | A |

* Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

ELECTRICAL CHARACTERISTICS FOR L7912C (refer to the test circuits, $T_j = 0$ to $150\text{ }^\circ\text{C}$,
 $V_i = -19\text{V}$, $I_o = 500\text{ mA}$, $C_i = 2.2\text{ }\mu\text{F}$, $C_o = 1\text{ }\mu\text{F}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|--|-------|------|------------|----------------------|
| V_o | Output Voltage | $T_j = 25\text{ }^\circ\text{C}$ | -11.5 | -12 | -12.5 | V |
| V_o | Output Voltage | $I_o = -5\text{ mA to } -1\text{ A}$ $P_o \leq 15\text{ W}$ $V_i = -15.5\text{ to } -27\text{ V}$ | -11.4 | -12 | -12.6 | V |
| ΔV_o^* | Line Regulation | $V_i = -14.5\text{ to } -30\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ $V_i = -16\text{ to } -22\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ | | | 240 120 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5\text{ to } 1500\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$ $I_o = 250\text{ to } 750\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$ | | | 240 120 | mV mV |
| I_d | Quiescent Current | $T_j = 25\text{ }^\circ\text{C}$ | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5\text{ to } 1000\text{ mA}$ | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -15\text{ to } -30\text{ V}$ | | | 1 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5\text{ mA}$ | | -0.8 | | mV/ $^\circ\text{C}$ |
| e_N | Output Noise Voltage | $B = 10\text{Hz to } 100\text{kHz}$ $T_j = 25\text{ }^\circ\text{C}$ | | 200 | | μV |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10\text{ V}$ $f = 120\text{ Hz}$ | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1\text{ A}$ $T_j = 25\text{ }^\circ\text{C}$ $\Delta V_o = 100\text{ mV}$ | | 1.1 | | V |
| I_{sc} | Short Circuit Current | | | 1.5 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25\text{ }^\circ\text{C}$ | | 2.5 | | A |

ELECTRICAL CHARACTERISTICS FOR L7915C (refer to the test circuits, $T_j = 0$ to $150\text{ }^\circ\text{C}$,
 $V_i = -23\text{V}$, $I_o = 500\text{ mA}$, $C_i = 2.2\text{ }\mu\text{F}$, $C_o = 1\text{ }\mu\text{F}$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|--|-------|------|------------|----------------------|
| V_o | Output Voltage | $T_j = 25\text{ }^\circ\text{C}$ | -14.4 | -15 | -15.6 | V |
| V_o | Output Voltage | $I_o = -5\text{ mA to } -1\text{ A}$ $P_o \leq 15\text{ W}$ $V_i = -18.5\text{ to } -30\text{ V}$ | -14.3 | -15 | -15.7 | V |
| ΔV_o^* | Line Regulation | $V_i = -17.5\text{ to } -30\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ $V_i = -20\text{ to } -26\text{ V}$ $T_j = 25\text{ }^\circ\text{C}$ | | | 300 150 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5\text{ to } 1500\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$ $I_o = 250\text{ to } 750\text{ mA}$ $T_j = 25\text{ }^\circ\text{C}$ | | | 300 150 | mV mV |
| I_d | Quiescent Current | $T_j = 25\text{ }^\circ\text{C}$ | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5\text{ to } 1000\text{ mA}$ | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -18.5\text{ to } -30\text{ V}$ | | | 1 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5\text{ mA}$ | | -0.9 | | mV/ $^\circ\text{C}$ |
| e_N | Output Noise Voltage | $B = 10\text{Hz to } 100\text{kHz}$ $T_j = 25\text{ }^\circ\text{C}$ | | 250 | | μV |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10\text{ V}$ $f = 120\text{ Hz}$ | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1\text{ A}$ $T_j = 25\text{ }^\circ\text{C}$ $\Delta V_o = 100\text{ mV}$ | | 1.1 | | V |
| I_{sc} | Short Circuit Current | | | 1.3 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25\text{ }^\circ\text{C}$ | | 2.2 | | A |

* Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

ELECTRICAL CHARACTERISTICS FOR L7918C (refer to the test circuits, $T_j = 0$ to 150 °C, $V_i = -27V$, $I_o = 500$ mA, $C_i = 2.2$ μ F, $C_o = 1$ μ F unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|---|-------|------|------------|----------|
| V_o | Output Voltage | $T_j = 25$ °C | -17.3 | -18 | -18.7 | V |
| V_o | Output Voltage | $I_o = -5$ mA to -1 A $P_o \leq 15$ W $V_i = -22$ to -33 V | -17.1 | -18 | -18.9 | V |
| ΔV_o^* | Line Regulation | $V_i = -21$ to -33 V $T_j = 25$ °C $V_i = -24$ to -30 V $T_j = 25$ °C | | | 360 180 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5$ to 1500 mA $T_j = 25$ °C $I_o = 250$ to 750 mA $T_j = 25$ °C | | | 360 180 | mV mV |
| I_d | Quiescent Current | $T_j = 25$ °C | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5$ to 1000 mA | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -22$ to -33 V | | | 1 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5$ mA | | -1 | | mV/°C |
| e_N | Output Noise Voltage | B = 10Hz to 100KHz $T_j = 25$ °C | | 300 | | μ V |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10$ V $f = 120$ Hz | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1$ A $T_j = 25$ °C $\Delta V_o = 100$ mV | | 1.1 | | V |
| I_{sc} | Short Circuit Current | | | 1.1 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25$ °C | | 2.2 | | A |

ELECTRICAL CHARACTERISTICS FOR L7920C (refer to the test circuits, $T_j = 0$ to 150 °C, $V_i = -29V$, $I_o = 500$ mA, $C_i = 2.2$ μ F, $C_o = 1$ μ F unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|---|-------|------|------------|----------|
| V_o | Output Voltage | $T_j = 25$ °C | -19.2 | -20 | -20.8 | V |
| V_o | Output Voltage | $I_o = -5$ mA to -1 A $P_o \leq 15$ W $V_i = -24$ to -35 V | -19 | -20 | -21 | V |
| ΔV_o^* | Line Regulation | $V_i = -23$ to -35 V $T_j = 25$ °C $V_i = -26$ to -32 V $T_j = 25$ °C | | | 400 200 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5$ to 1500 mA $T_j = 25$ °C $I_o = 250$ to 750 mA $T_j = 25$ °C | | | 400 200 | mV mV |
| I_d | Quiescent Current | $T_j = 25$ °C | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5$ to 1000 mA | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -24$ to -35 V | | | 1 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5$ mA | | -1.1 | | mV/°C |
| e_N | Output Noise Voltage | B = 10Hz to 100KHz $T_j = 25$ °C | | 350 | | μ V |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10$ V $f = 120$ Hz | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1$ A $T_j = 25$ °C $\Delta V_o = 100$ mV | | 1.1 | | V |
| I_{sc} | Short Circuit Current | | | 0.9 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25$ °C | | 2.5 | | A |

* Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

ELECTRICAL CHARACTERISTICS FOR L7922C (refer to the test circuits, $T_j = 0$ to 150 °C, $V_i = -31$ V, $I_o = 500$ mA, $C_i = 2.2$ μ F, $C_o = 1$ μ F unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|---|-------|------|------------|----------|
| V_o | Output Voltage | $T_j = 25$ °C | -21.1 | -22 | -22.9 | V |
| V_o | Output Voltage | $I_o = -5$ mA to -1 A $P_o \leq 15$ W $V_i = -26$ to -37 V | -20.9 | -22 | -23.1 | V |
| ΔV_o^* | Line Regulation | $V_i = -25$ to -37 V $T_j = 25$ °C $V_i = -28$ to -34 V $T_j = 25$ °C | | | 440 220 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5$ to 1500 mA $T_j = 25$ °C $I_o = 250$ to 750 mA $T_j = 25$ °C | | | 440 220 | mV mV |
| I_d | Quiescent Current | $T_j = 25$ °C | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5$ to 1000 mA | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -26$ to -37 V | | | 1 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5$ mA | | -1.1 | | mV/°C |
| e_N | Output Noise Voltage | $B = 10$ Hz to 100 KHz $T_j = 25$ °C | | 375 | | μ V |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10$ V $f = 120$ Hz | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1$ A $T_j = 25$ °C $\Delta V_o = 100$ mV | | 1.1 | | V |
| I_{sc} | Short Circuit Current | | | 1.1 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25$ °C | | 2.2 | | A |

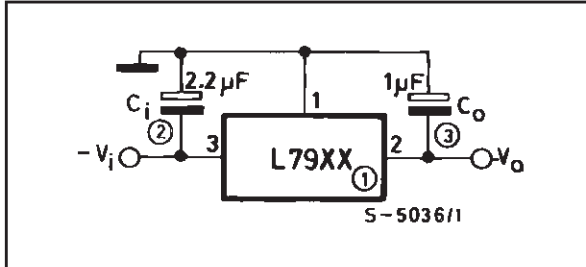
ELECTRICAL CHARACTERISTICS FOR L7924C (refer to the test circuits, $T_j = 0$ to 150 °C, $V_i = -33$ V, $I_o = 500$ mA, $C_i = 2.2$ μ F, $C_o = 1$ μ F unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|----------------------------|---|-------|------|------------|----------|
| V_o | Output Voltage | $T_j = 25$ °C | -23 | -24 | -25 | V |
| V_o | Output Voltage | $I_o = -5$ mA to -1 A $P_o \leq 15$ W $V_i = -27$ to -38 V | -22.8 | -24 | -25.2 | V |
| ΔV_o^* | Line Regulation | $V_i = -27$ to -38 V $T_j = 25$ °C $V_i = -30$ to -36 V $T_j = 25$ °C | | | 480 240 | mV mV |
| ΔV_o^* | Load Regulation | $I_o = 5$ to 1500 mA $T_j = 25$ °C $I_o = 250$ to 750 mA $T_j = 25$ °C | | | 480 240 | mV mV |
| I_d | Quiescent Current | $T_j = 25$ °C | | | 3 | mA |
| ΔI_d | Quiescent Current Change | $I_o = 5$ to 1000 mA | | | 0.5 | mA |
| ΔI_d | Quiescent Current Change | $V_i = -27$ to -38 V | | | 1 | mA |
| $\frac{\Delta V_o}{\Delta T}$ | Output Voltage Drift | $I_o = 5$ mA | | -1 | | mV/°C |
| e_N | Output Noise Voltage | $B = 10$ Hz to 100 KHz $T_j = 25$ °C | | 400 | | μ V |
| SVR | Supply Voltage Rejection | $\Delta V_i = 10$ V $f = 120$ Hz | 54 | 60 | | dB |
| V_d | Dropout Voltage | $I_o = 1$ A $T_j = 25$ °C $\Delta V_o = 100$ mV | | 1.1 | | V |
| I_{sc} | Short Circuit Current | | | 1.1 | | A |
| I_{scp} | Short Circuit Peak Current | $T_j = 25$ °C | | 2.2 | | A |

* Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

APPLICATION INFORMATION

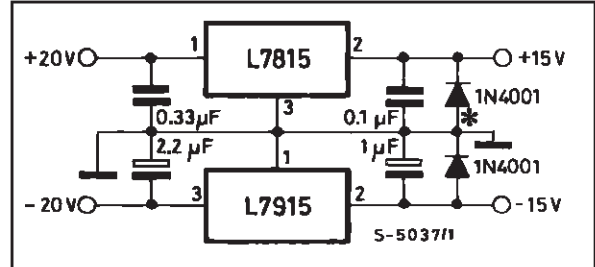
Figure 1 : Fixed Output Regulator.



Notes :

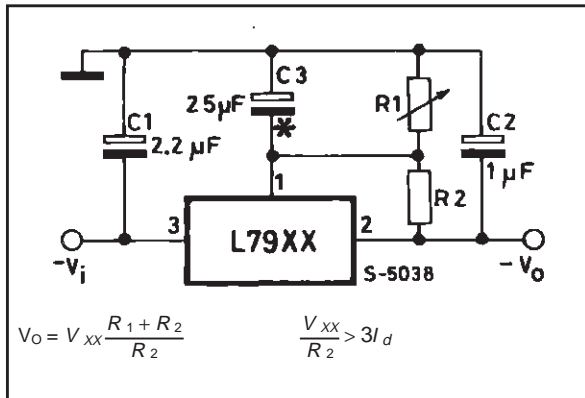
1. To specify an output voltage, substitute voltage value for "XX".
2. Required for stability. For value given, capacitor must be solid tantalum. If aluminium electrolytics are used, at least ten times value should be selected. C₁ is required if regulator is located an appreciable distance from power supply filter.
3. To improve transient response. If large capacitors are used, a high current diode from input to output (1N4001 or similar) should be introduced to protect the device from momentary input short circuit.

Figure 2 : Split Power Supply (± 15V/1A).



Against potential latch-up problems.

Figure 3 : Circuit for Increasing Output Voltage.



C3 Optional for improved transient response and ripple rejection.

Figure 4 : High Current Negative Regulator (- 5V/4A with 5A current limiting).

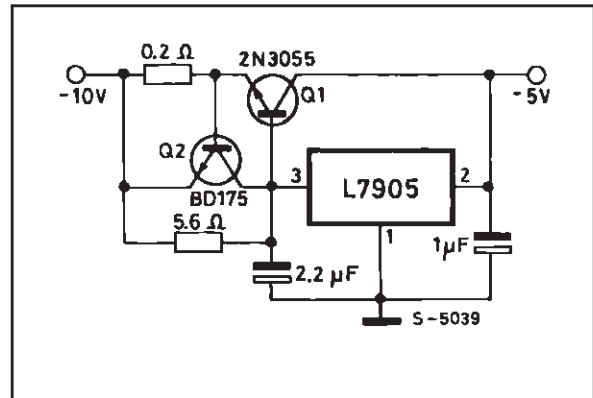
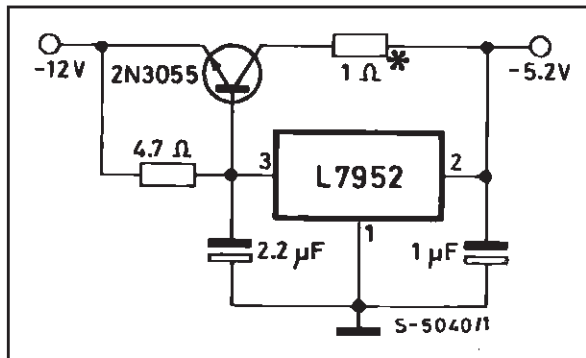


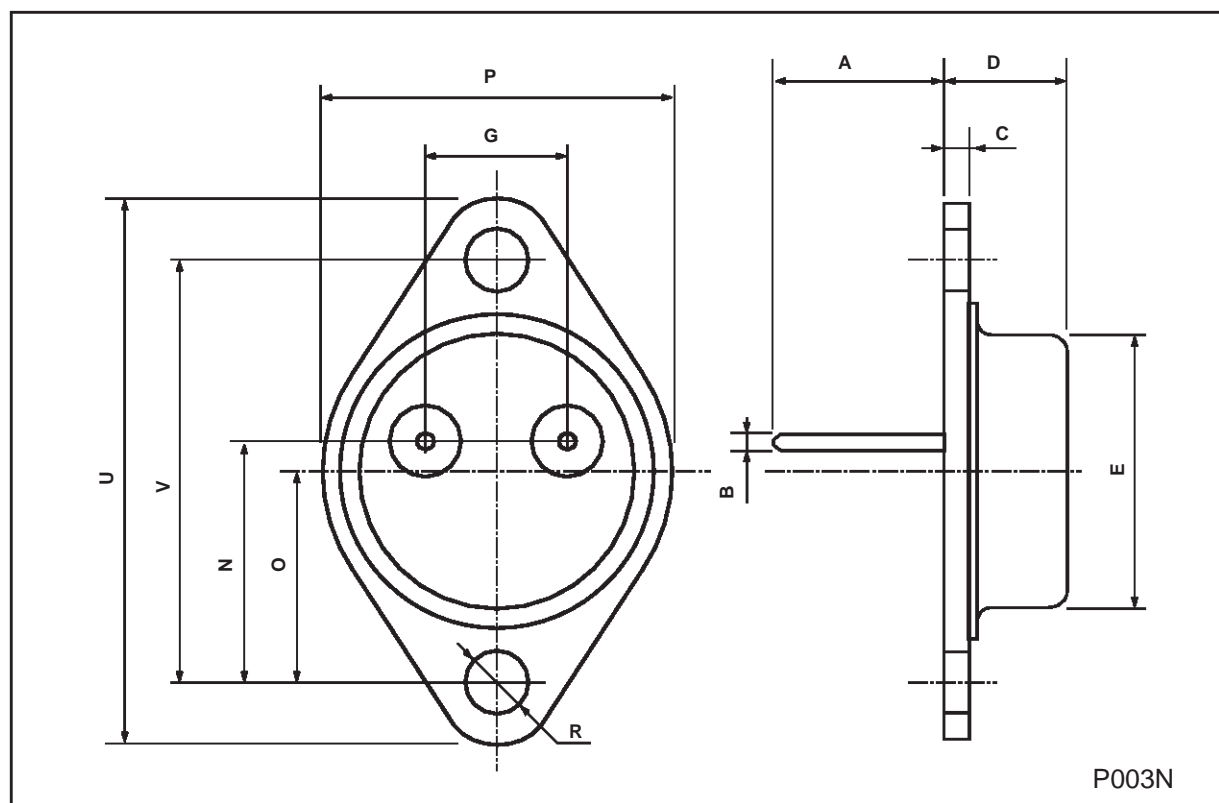
Figure 5 : Typical ECL System Power Supply (- 5.2V/4A).



Optional dropping resistor to reduce the power dissipated in the boost transistor.

TO-3 (R) MECHANICAL DATA

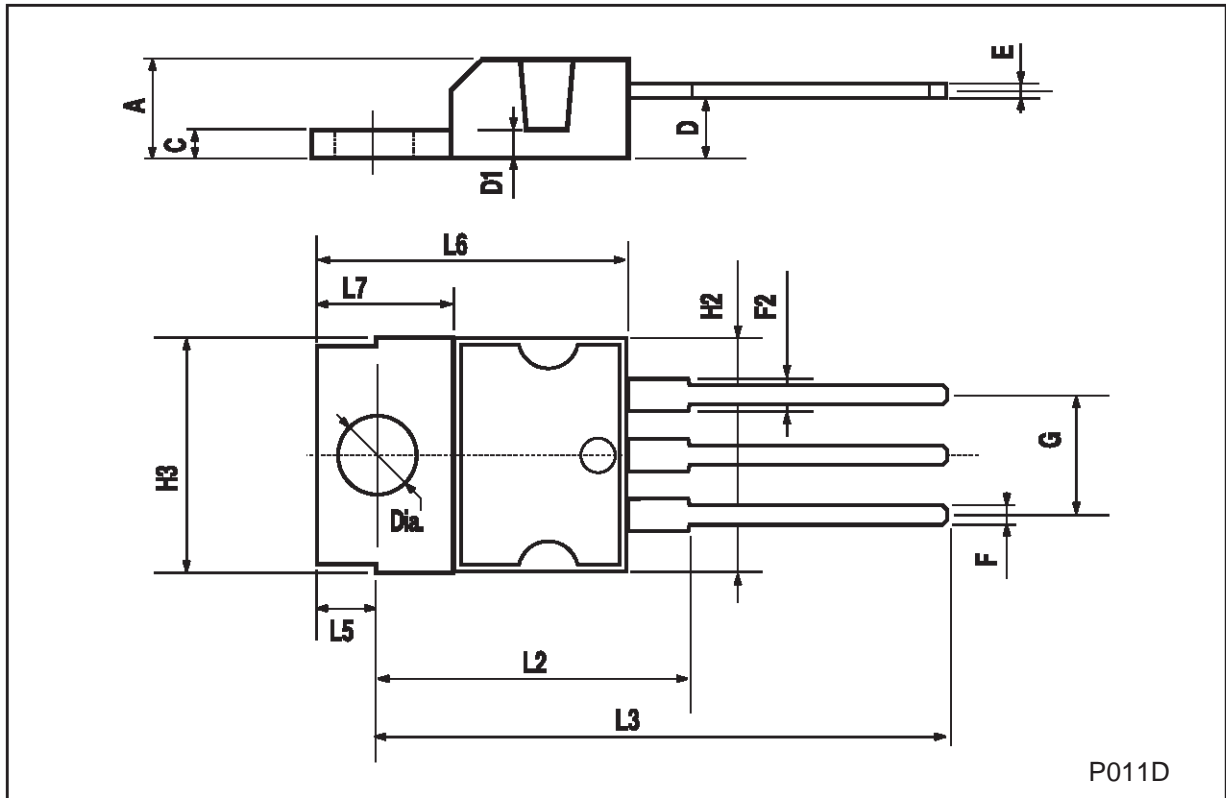
| DIM. | mm | | | inch | | |
|------|------|-------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | 11.7 | | | 0.460 | |
| B | 0.96 | | 1.10 | 0.037 | | 0.043 |
| C | | | 1.70 | | | 0.066 |
| D | | | 8.7 | | | 0.342 |
| E | | | 20.0 | | | 0.787 |
| G | | 10.9 | | | 0.429 | |
| N | | 16.9 | | | 0.665 | |
| P | | | 26.2 | | | 1.031 |
| R | 3.88 | | 4.09 | 0.152 | | 0.161 |
| U | | | 39.50 | | | 1.555 |
| V | | 30.10 | | | 1.185 | |



P003N

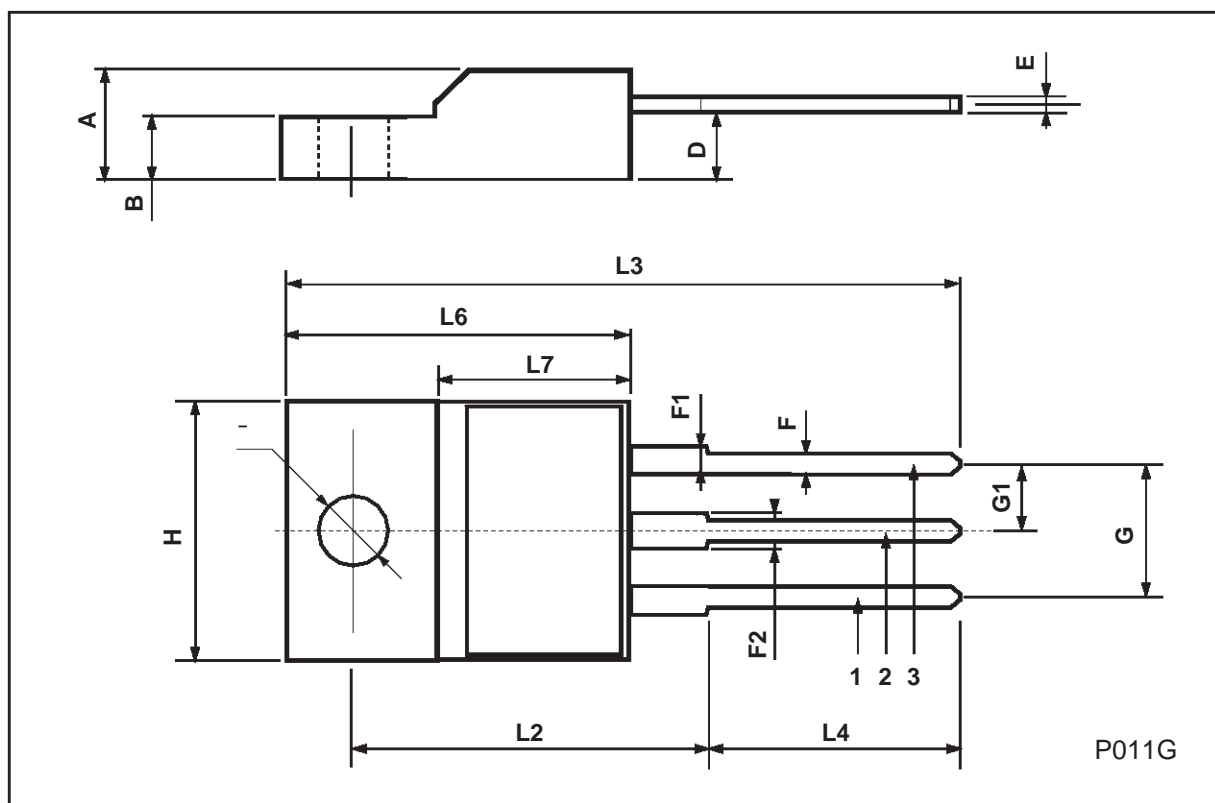
TO-220 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 4.8 | | | 0.189 |
| C | | | 1.37 | | | 0.054 |
| D | 2.4 | | 2.8 | 0.094 | | 0.110 |
| D1 | 1.2 | | 1.35 | 0.047 | | 0.053 |
| E | 0.35 | | 0.55 | 0.014 | | 0.022 |
| F | 0.61 | | 0.94 | 0.024 | | 0.037 |
| F2 | 1.15 | | 1.4 | 0.045 | | 0.055 |
| G | 4.95 | 5.08 | 5.21 | 0.195 | 0.200 | 0.205 |
| H2 | | | 10.4 | | | 0.409 |
| H3 | 10.05 | | 10.4 | 0.396 | | 0.409 |
| L2 | | 16.2 | | | 0.638 | |
| L3 | 26.3 | 26.7 | 27.1 | 1.035 | 1.051 | 1.067 |
| L5 | 2.6 | | 3 | 0.102 | | 0.118 |
| L6 | 15.1 | | 15.8 | 0.594 | | 0.622 |
| L7 | 6 | | 6.6 | 0.236 | | 0.260 |
| Dia. | 3.65 | | 3.85 | 0.144 | | 0.152 |



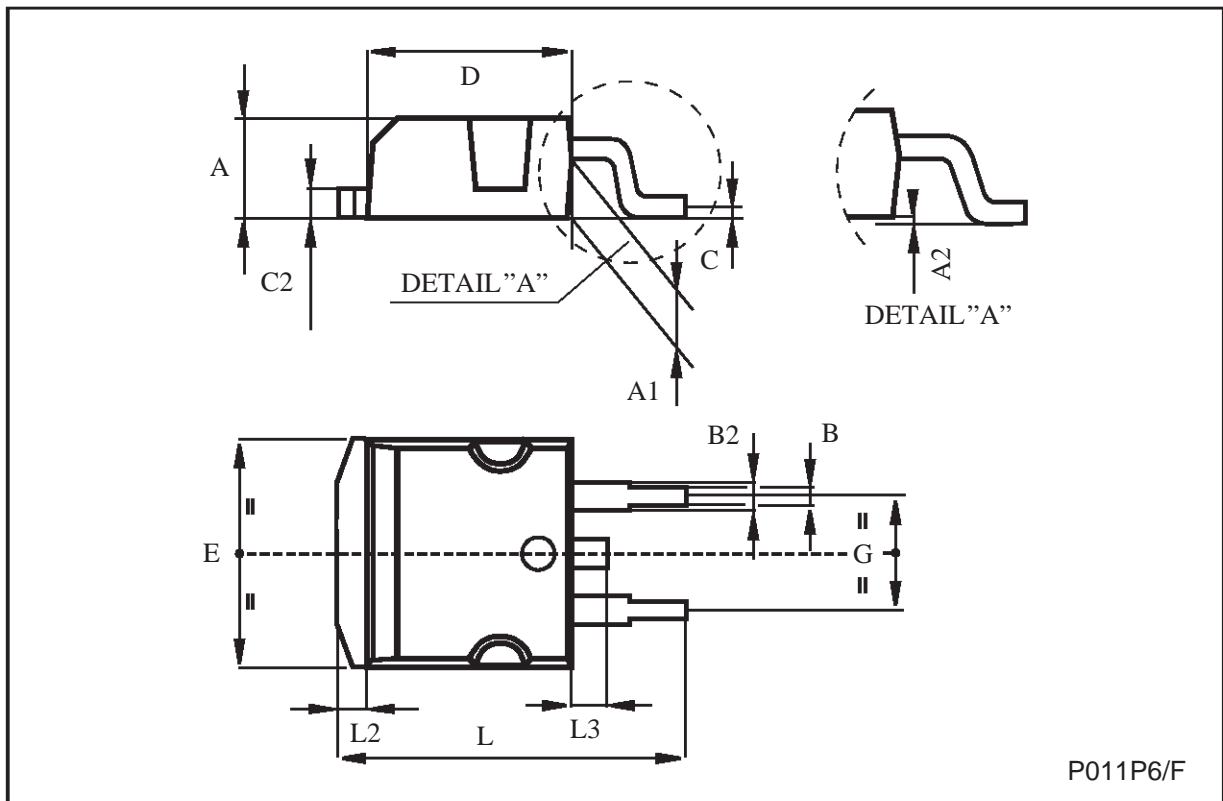
ISOWATT220 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------|------|------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.4 | | 4.6 | 0.173 | | 0.181 |
| B | 2.5 | | 2.7 | 0.098 | | 0.106 |
| D | 2.5 | | 2.75 | 0.098 | | 0.108 |
| E | 0.4 | | 0.7 | 0.015 | | 0.027 |
| F | 0.75 | | 1 | 0.030 | | 0.039 |
| F1 | 1.15 | | 1.7 | 0.045 | | 0.067 |
| F2 | 1.15 | | 1.7 | 0.045 | | 0.067 |
| G | 4.95 | | 5.2 | 0.195 | | 0.204 |
| G1 | 2.4 | | 2.7 | 0.094 | | 0.106 |
| H | 10 | | 10.4 | 0.393 | | 0.409 |
| L2 | | 16 | | | 0.630 | |
| L3 | 28.6 | | 30.6 | 1.126 | | 1.204 |
| L4 | 9.8 | | 10.6 | 0.385 | | 0.417 |
| L6 | 15.9 | | 16.4 | 0.626 | | 0.645 |
| L7 | 9 | | 9.3 | 0.354 | | 0.366 |
| Ø | 3 | | 3.2 | 0.118 | | 0.126 |



TO-263 (D²PAK) MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------|------|-------|-------|------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.4 | | 4.6 | 0.173 | | 0.181 |
| A1 | 2.49 | | 2.69 | 0.098 | | 0.106 |
| B | 0.7 | | 0.93 | 0.027 | | 0.036 |
| B2 | 1.14 | | 1.7 | 0.044 | | 0.067 |
| C | 0.45 | | 0.6 | 0.017 | | 0.023 |
| C2 | 1.23 | | 1.36 | 0.048 | | 0.053 |
| D | 8.95 | | 9.35 | 0.352 | | 0.368 |
| E | 10 | | 10.4 | 0.393 | | 0.409 |
| G | 4.88 | | 5.28 | 0.192 | | 0.208 |
| L | 15 | | 15.85 | 0.590 | | 0.624 |
| L2 | 1.27 | | 1.4 | 0.050 | | 0.055 |
| L3 | 1.4 | | 1.75 | 0.055 | | 0.068 |



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