



# L4957

## UP TO 5A ULDO LINEAR REGULATOR

PRODUCT PREVIEW

- 1.5V AND 2.5V FIXED OUTPUT VOLTAGE
- 3V TO 7V INPUT VOLTAGE RANGE
- 200mΩ R<sub>DS(on)</sub> TYPICAL @ T<sub>J</sub> = 125°C
- 0.6V max. DROP-OUT AT 2A
- EXCELLENT LOAD REGULATION
- 0.6mA QUIESCENT CURRENT AT ANY LOAD
- SHORT CIRCUIT PROTECTION WITH FOLD-BACK
- THERMAL SHUTDOWN

### APPLICATIONS

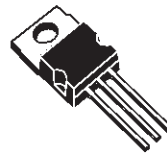
- MOTHER BOARDS
- PROCESSOR I/O & SUPPLIES
- LOW VOLTAGE MEMORY & CHIP SET SUPPLIES
- GRAPHIC & SOUND CARDS
- LOW VOLTAGE LOGIC SUPPLIES
- POST REGULATOR FOR SMPS

### DESCRIPTION

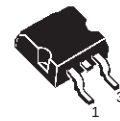
The L4957 devices are **Ultra Low Drop Output** linear regulators with an internal N-channel MOS of 200mΩ particularly suitable for low voltage/low dropout applications.

Operating with a input voltage from 3V to 6.5V they are capable to deliver up to 5A at 1.5V or 2.5V fixed output voltages.

### MULTIPOWER BCD TECHNOLOGY



Versawatt TO-220



D<sup>2</sup>PAK

#### ORDERING NUMBERS:

L4957V1.5  
L4957V2.5

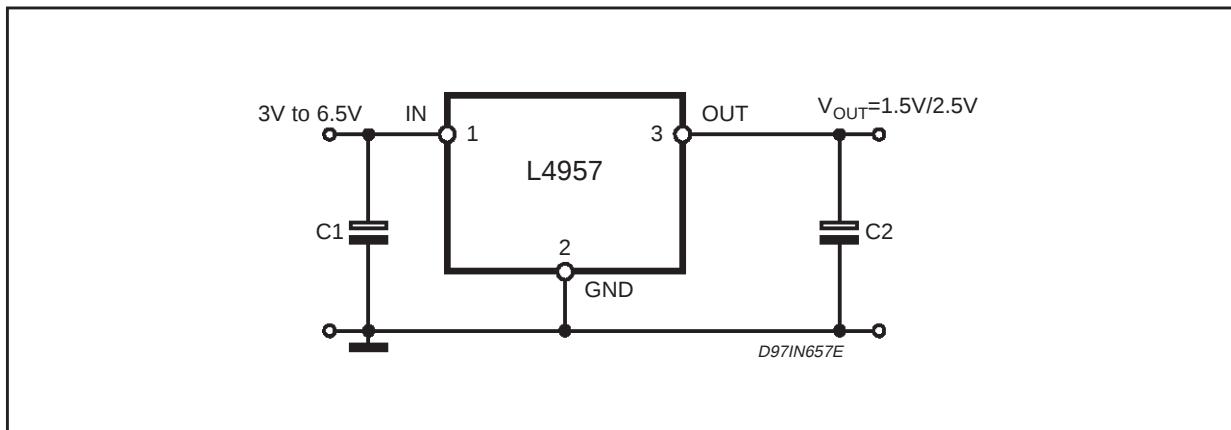
L4957D1.5  
L4957D2.5

The devices are ideal for use as one of the supplies required by processor, for example they are the cost effective and efficient solution for conversion from 3.3V (rail bus) to 2.5V @ 2.5A or to 1.5V with high current rating (up to 5A).

Fast response transient minimise the output capacitor value. A minimum of 22μF assures the stability in all load conditions.

The on-chip trimming technique offers a tighter voltage reference tolerance (with ± 2% including line and load variation) beside to ensure a controlled short circuit current. Thermal shutdown provides protection against overload conditions that creates excessive junction temperature.

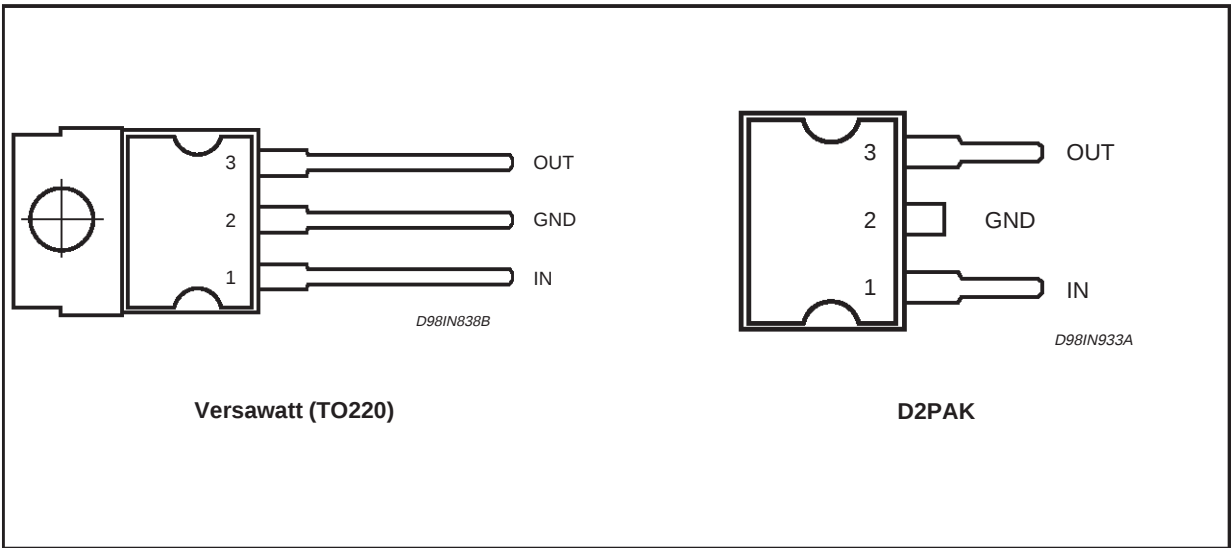
### TYPICAL APPLICATION



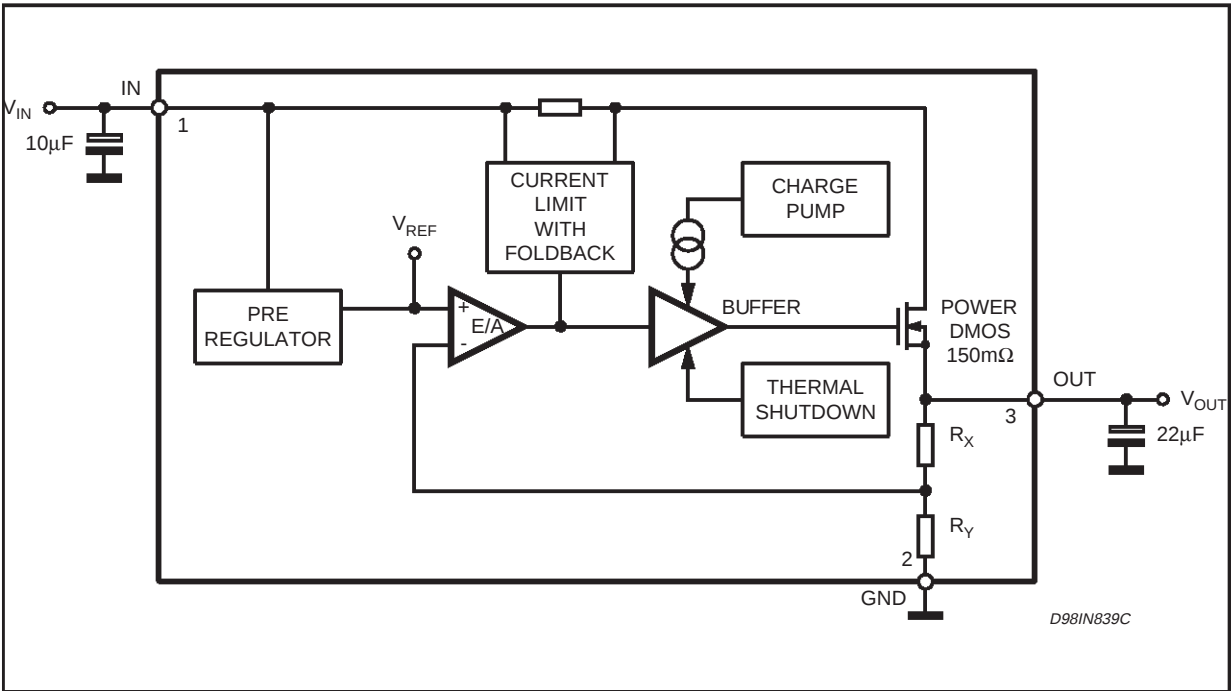
ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter            | Value       | Unit |
|-----------|----------------------|-------------|------|
| $V_{IN}$  | Supply Input Voltage | 7           | V    |
| $T_j$     | Junction Temperature | -40 to +150 | °C   |
| $T_{stg}$ | Storage Temperature  | -40 to +150 | °C   |

PINS CONNECTION



BLOCK DIAGRAM



## PIN FUNCTIONS

| Pin N° | Name | Function                                                                                            |
|--------|------|-----------------------------------------------------------------------------------------------------|
| 1      | IN   | Unregulated input voltage; this pin must be bypassed with a capacitor larger than 10 $\mu$ F.       |
| 2      | GND  | To connect to Ground to get 1.5V or 2.5V output.                                                    |
| 3      | OUT  | Regulated output voltage. A minimum bypass capacitor of 22 $\mu$ F is required to insure stability. |

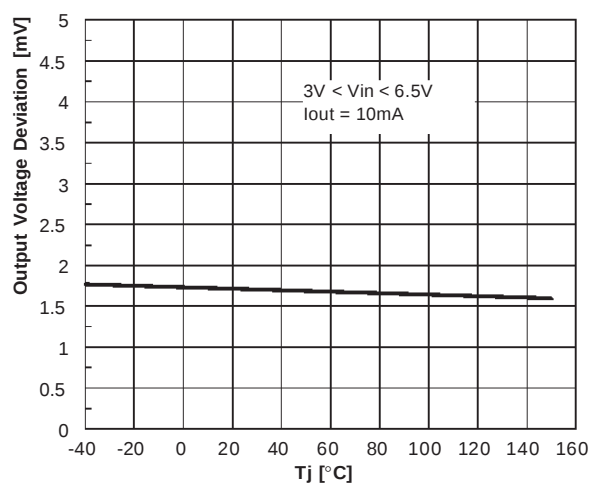
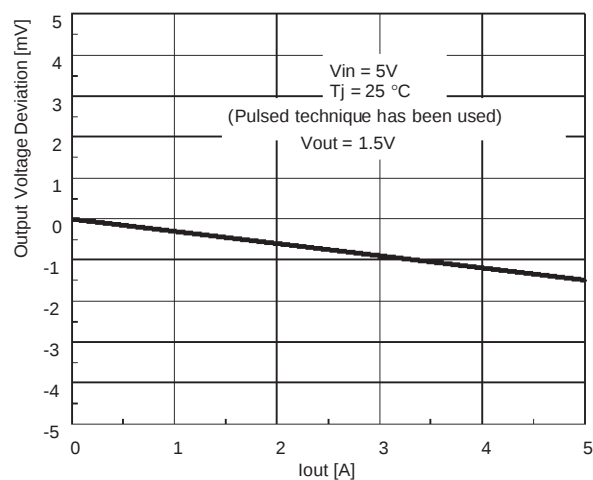
## THERMAL DATA

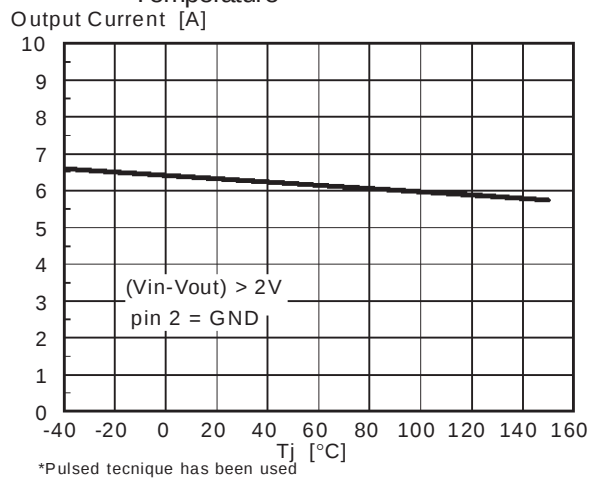
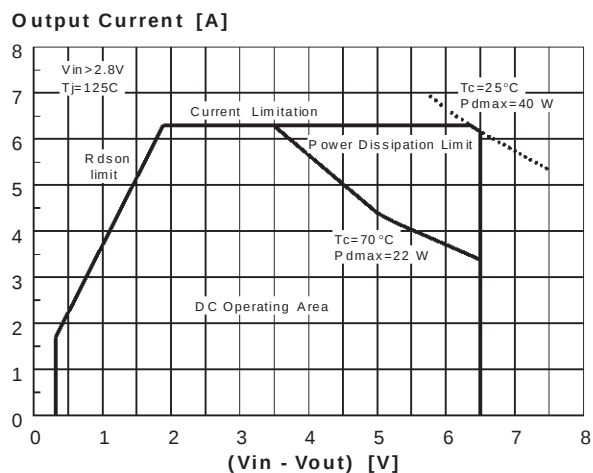
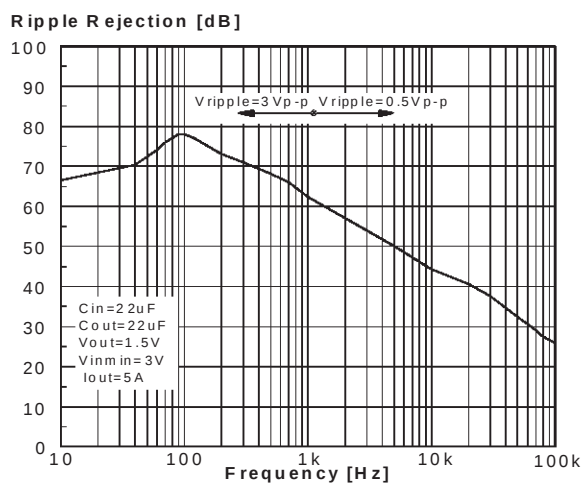
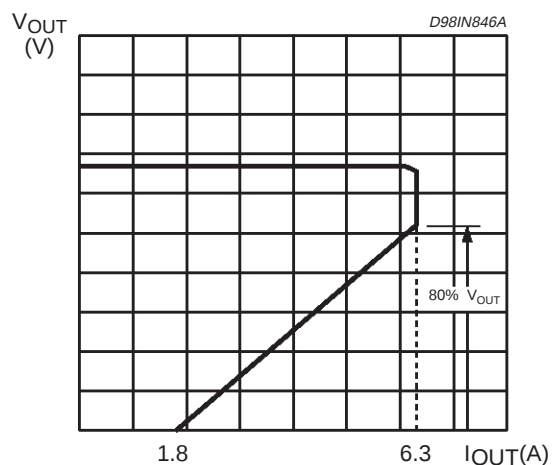
| Symbol           | Parameter                           |      | TO220 | D2PAK | Unit          |
|------------------|-------------------------------------|------|-------|-------|---------------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case    | Max. | 2.5   | 3     | $^{\circ}C/W$ |
| $R_{th\ j-amb}$  | Thermal Resistance Junction-ambient | Max. | 50    | 60    | $^{\circ}C/W$ |
|                  | Thermal Shutdown                    | Typ. | 150   |       | $^{\circ}C$   |
|                  | Thermal Hysteresis                  | Typ. | 20    |       | $^{\circ}C$   |

**L4957 - ELECTRICAL CHARACTERISTICS** ( $T_J = 25^{\circ}C$ ,  $V_{IN} = 5V$ , unless otherwise specified).● = Specifications referred to  $T_J$  from  $0^{\circ}C$  to  $+125^{\circ}C$ .

| Symbol       | Parameter                    | Test Condition                                                      |   | Min.  | Typ. | Max.  | Unit       |
|--------------|------------------------------|---------------------------------------------------------------------|---|-------|------|-------|------------|
| $V_{IN}$     | Operating Supply Voltage (1) |                                                                     |   | 3     |      | 6.5   | V          |
| $V_O$        | Output Voltage (1)           | <b>For L4957V1.5/D1.5</b>                                           |   |       |      |       |            |
|              |                              | $0.1A < I_O < 5A$ ; $3V < V_{IN} < 6.5V$                            |   | 1.47  | 1.5  | 1.53  | V          |
|              |                              | $3V < V_{IN} < 6.5V$ ; $0.1A < I_O < 5A$                            | ● | 1.455 | 1.5  | 1.545 | V          |
|              |                              | <b>For L4957V2.5/D2.5</b>                                           |   |       |      |       |            |
|              |                              | $0.1A < I_O < 5A$ ; $3V < V_{IN} < 6.5V$                            |   | 2.45  | 2.5  | 2.55  | V          |
|              |                              | $3V < V_{IN} < 6.5V$ ; $0.1A < I_O < 5A$                            | ● | 2.425 | 2.5  | 2.575 | V          |
| $\Delta V_O$ | Load regulation (1)          | $0.1A < I_O < 5A$                                                   |   |       | 2    | 10    | mV         |
| $R_{DS(on)}$ | Drain-Source ON Resistance   |                                                                     | ● |       | 200  | 300   | m $\Omega$ |
| $I_O$        | Current Limiting             | $90\% V_O$                                                          | ● | 5.1   | 6.3  | 7.5   | A          |
|              | Short Circuit Current        | $V_O = 0V$                                                          | ● |       | 1.8  |       | A          |
| $I_Q$        | Quiescent Current            | $0.1A < I_O < 5A$ $3V < V_{IN} < 6.5V$                              | ● | 0.5   |      | 2     | mA         |
|              | Ripple Rejection             | $f = 120Hz$ , $I_O = 5A$<br>$V_{IN} = 5V$ $\Delta V_{IN} = 2V_{PP}$ |   | 60    | 75   |       | dB         |

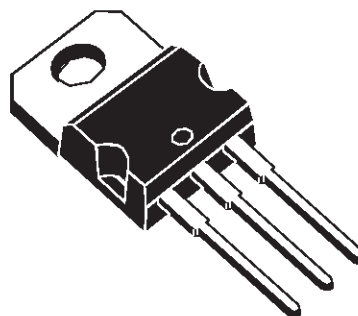
(1) GND connected to ground.

**Figure 1: Line Regulation vs. Junction Temperature****Figure 2: Load Regulation**

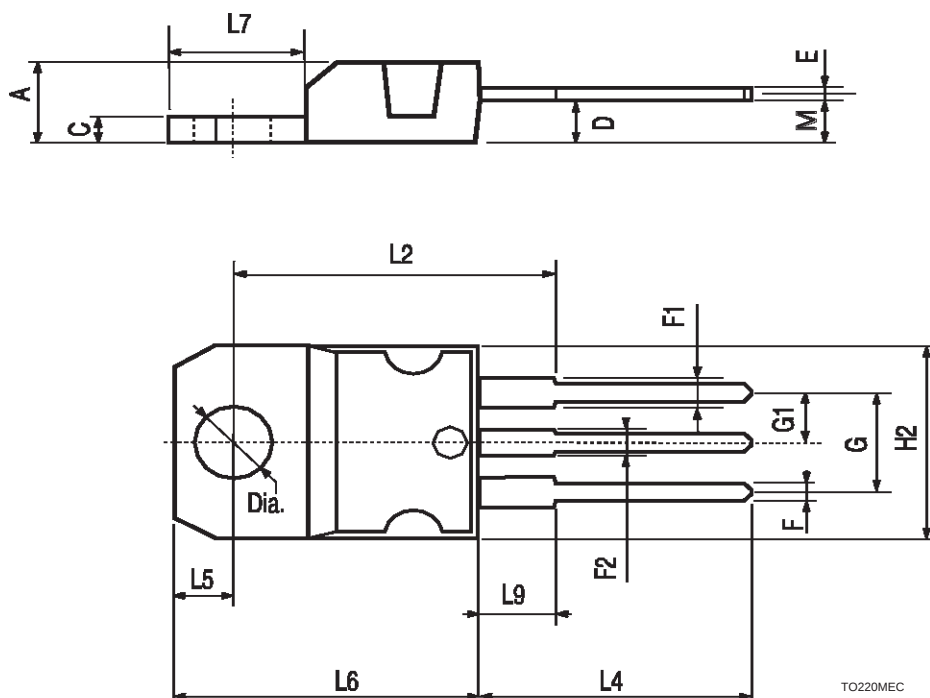
**Figure 3: Maximum Output Current vs. Junction Temperature****Figure 4: DC Operating Area****Figure 5: Ripple Rejection vs. Frequency****Figure 6: Output Voltage vs. Output Current. ( $V_{OUT} = 1.5V$ )**

| DIM. | mm    |      |       | inch  |       |       |
|------|-------|------|-------|-------|-------|-------|
|      | MIN.  | TYP. | MAX.  | MIN.  | TYP.  | MAX.  |
| A    | 4.40  |      | 4.60  | 0.173 |       | 0.181 |
| C    | 1.23  |      | 1.32  | 0.048 |       | 0.051 |
| D    | 2.40  |      | 2.72  | 0.094 |       | 0.107 |
| E    | 0.49  |      | 0.70  | 0.019 |       | 0.027 |
| F    | 0.61  |      | 0.88  | 0.024 |       | 0.034 |
| F1   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| F2   | 1.14  |      | 1.70  | 0.044 |       | 0.067 |
| G    | 4.95  |      | 5.15  | 0.194 |       | 0.203 |
| G1   | 2.40  |      | 2.70  | 0.094 |       | 0.106 |
| H2   | 10.0  |      | 10.4  | 0.393 |       | 0.409 |
| L2   |       | 16.4 |       |       | 0.645 |       |
| L4   | 13.0  |      | 14.0  | 0.511 |       | 0.551 |
| L5   | 2.65  |      | 2.95  | 0.104 |       | 0.116 |
| L6   | 15.25 |      | 15.75 | 0.600 |       | 0.620 |
| L7   | 6.20  |      | 6.60  | 0.244 |       | 0.260 |
| L9   | 3.50  |      | 3.93  | 0.137 |       | 0.154 |
| M    |       | 2.6  |       |       | 0.102 |       |
| Dia  | 3.75  |      | 3.85  | 0.147 |       | 0.151 |

## OUTLINE AND MECHANICAL DATA

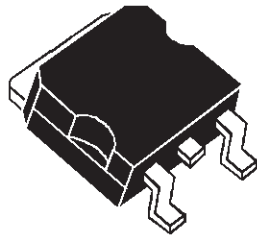


**Versawatt (TO220)**

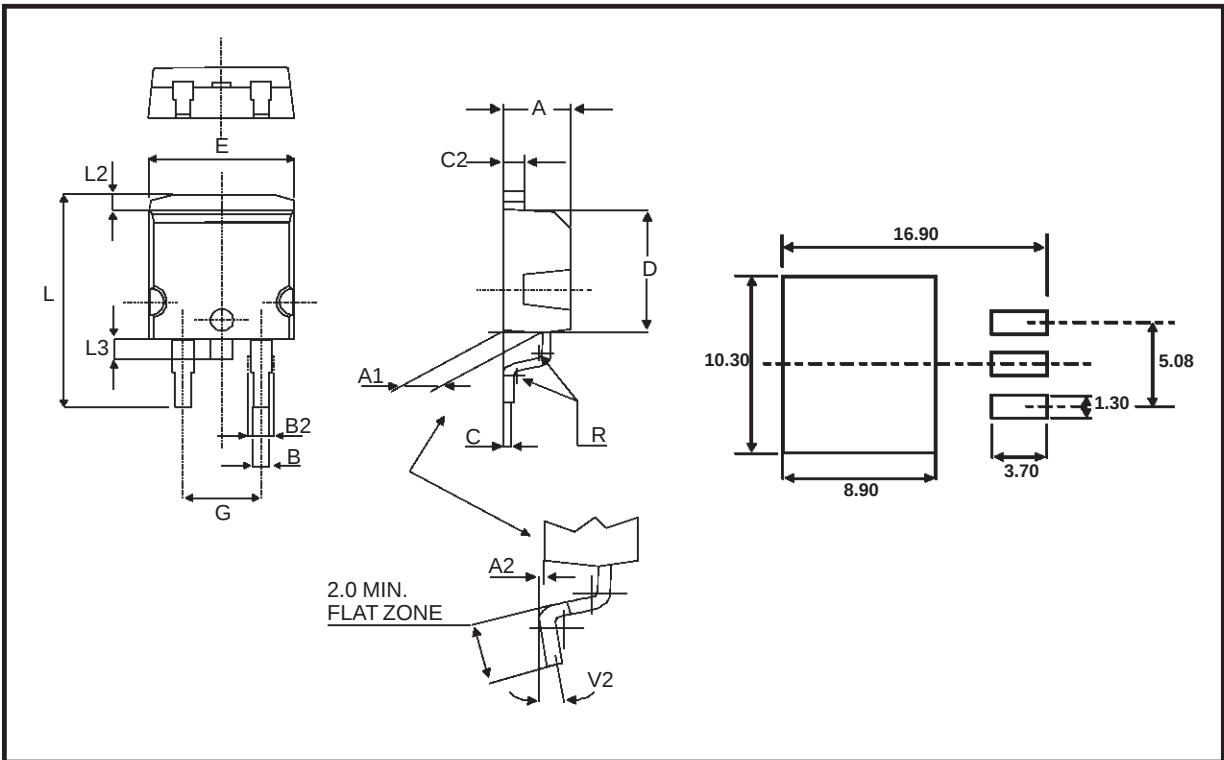


| REF. | DIMENSIONS  |      |       |        |       |       |
|------|-------------|------|-------|--------|-------|-------|
|      | Millimeters |      |       | Inches |       |       |
|      | Min.        | Typ. | Max.  | Min.   | Typ.  | Max.  |
| A    | 4.30        |      | 4.60  | 0.169  |       | 0.181 |
| A1   | 2.49        |      | 2.69  | 0.098  |       | 0.106 |
| A2   | 0.03        |      | 0.23  | 0.001  |       | 0.009 |
| B    | 0.70        |      | 0.93  | 0.027  |       | 0.037 |
| B2   | 1.25        | 1.40 |       | 0.049  | 0.055 |       |
| C    | 0.45        |      | 0.60  | 0.017  |       | 0.024 |
| C2   | 1.21        |      | 1.36  | 0.047  |       | 0.054 |
| D    | 8.95        |      | 9.35  | 0.352  |       | 0.368 |
| E    | 10.00       |      | 10.28 | 0.393  |       | 0.405 |
| G    | 4.88        |      | 5.28  | 0.192  |       | 0.208 |
| L    | 15.00       |      | 15.85 | 0.590  |       | 0.624 |
| L2   | 1.27        |      | 1.40  | 0.050  |       | 0.055 |
| L3   | 1.40        |      | 1.75  | 0.055  |       | 0.069 |
| R    |             | 0.40 |       |        | 0.016 |       |
| V2   | 0°          |      | 8°    | 0°     |       | 8°    |

OUTLINE AND  
MECHANICAL DATA



D<sup>2</sup>PAK



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