

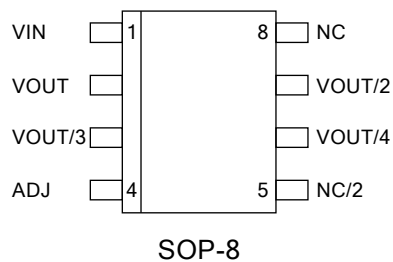
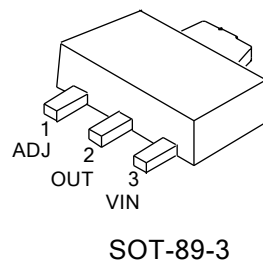
## 1.Description

This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply more than 0.1A of load current with an output voltage adjustable over a 1.2 to 37V. It employs internal current limiting, thermal shut-down and safe area compensation.

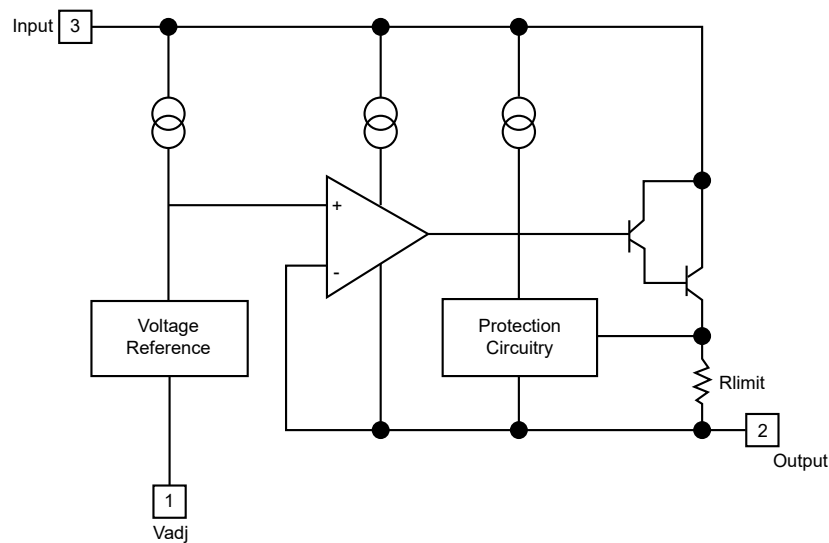
## 2.Features

- Internal thermal overload protection
- Internal short circuit current limiting
- Output transistor safe operating area compensation

## 3.Pinning information



## 4.Internal Block Diagram





## 5. Absolute Maximum Rating

| Parameter                                 |        | Symbol                  | Value      | Units |
|-------------------------------------------|--------|-------------------------|------------|-------|
| Input-Output Voltage Differential         |        | $V_I - V_O$             | 40         | V     |
| Lead Temperature                          |        | $T_{LEAD}$              | 230        | °C    |
| Power Dissipation                         | SOT-89 | $P_D$                   | 400        | mW    |
|                                           | SOP-8  |                         | 400        | mW    |
| Junction Temperature Range                |        | $T_J$                   | 0 to 125   | °C    |
| Storage Temperature Range                 |        | $T_{STG}$               | -55 to 125 | °C    |
| Temperature Coefficient of Output Voltage |        | $\Delta V_O / \Delta T$ | ±0.02      | %/°C  |



## 6. Electrical Characteristics

( $V_O - V_I = 5V$ ,  $I_O = 0.5A$ ,  $-40^\circ C \leq T_J \leq +125^\circ C$ , unless otherwise specified)

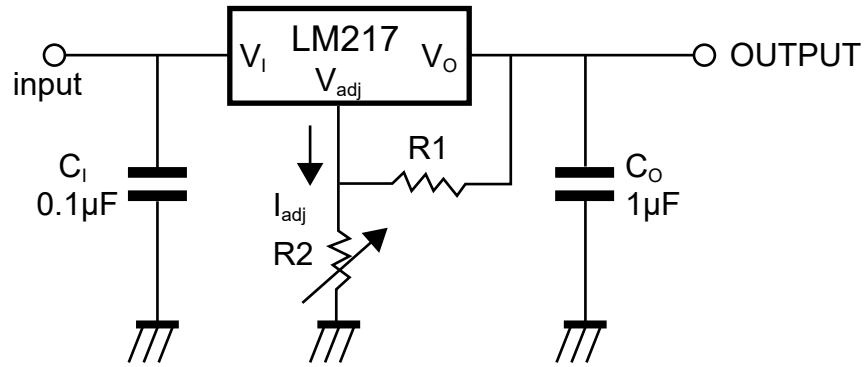
| Parameter                                   | Symbol           | Conditions                                                                           | Min                | Typ   | Max  | Units        |
|---------------------------------------------|------------------|--------------------------------------------------------------------------------------|--------------------|-------|------|--------------|
| Line Regulation (note1)                     | $R_{line}$       | $T_A = 25^\circ C$ , $3V \leq V_I - V_O \leq 40V$                                    |                    | 0.01  | 0.04 | % / V        |
|                                             |                  | $3V \leq V_I - V_O \leq 40V$                                                         |                    | 0.02  | 0.07 |              |
| Load Regulation (note1)                     | $R_{load}$       | $V_O \leq 5V$ , $I_O = 5$ to $100mA$                                                 | $T_J = 25^\circ C$ | 5     | 15   | mV           |
|                                             |                  |                                                                                      |                    | 20    | 50   |              |
|                                             |                  | $V_O \geq 5V$ , $I_O = 5$ to $100mA$                                                 | $T_J = 25^\circ C$ | 0.1   | 0.3  | %            |
|                                             |                  |                                                                                      |                    | 0.3   | 1    |              |
| Adjustable Pin Current                      | $I_{ADJ}$        |                                                                                      |                    | 46    | 100  | $\mu A$      |
| Adjustable Pin Current Change               | $\Delta I_{ADJ}$ | $3V \leq V_I - V_O \leq 40V$<br>$10mA \leq I_O \leq I_{MAX}$ , $P_D \leq P_{MAX}$    |                    | 0.2   | 5    |              |
| Reference Voltage                           | $V_{REF}$        | $3V \leq V_{IN} - V_O \leq 40V$<br>$10mA \leq I_O \leq I_{MAX}$ , $P_D \leq P_{MAX}$ | 1.2                | 1.25  | 1.3  | V            |
| Temperature Stability                       | $ST_T$           |                                                                                      |                    | 0.7   |      | % / $V_O$    |
| Minimum Load Current to Maintain Regulation | $I_{L(MIN)}$     | $V_I - V_O = 40V$                                                                    |                    | 3.5   | 5    | mA           |
| Maximum Output Current                      | $I_{O(MAX)}$     | $V_I - V_O \leq 3-13V$                                                               | 100                | 200   |      | mA           |
|                                             |                  | $P_D \leq P_{MAX}$ , $V_I - V_O \leq 40V$ , $P_D \leq P_{MAX}$                       |                    | 50    |      |              |
| RMS Noise, % of $V_{OUT}$                   | $e_N$            | $T_A = 25^\circ C$ , $10Hz \leq f \leq 10KHz$                                        |                    | 0.003 | 0.01 | % / $V_O$    |
| Ripple Rejection                            | RR               | $V_O = 10V$ , $f = 120Hz$ without $C_{ADJ}$                                          |                    | 65    |      | dB           |
|                                             |                  | $C_{ADJ} = 10\mu F$ (note2)                                                          | 66                 | 80    |      |              |
| Long-Term Stability, $T_J = T_{HIGH}$       | ST               | $T_A = 25^\circ C$ for end point measurements, 1000HR                                |                    | 0.3   | 1    | %            |
| Thermal Resistance Junction to case         | $R_{\theta JC}$  |                                                                                      |                    | 5     |      | $^\circ C/W$ |

Notes: 1. Load and line regulation are specified at constant junction temperature. Change in  $V_D$  due to heating effects must be taken into account separately. Pulse testing with low duty is used. ( $P_{MAX} = 20W$ )

2.  $C_{ADJ}$  - when used, is connected between the adjustment pin and ground.



## 7. Typical Application



$$V_o = 1.25V(1 + R_2/R_1) + I_{adj} R_2$$

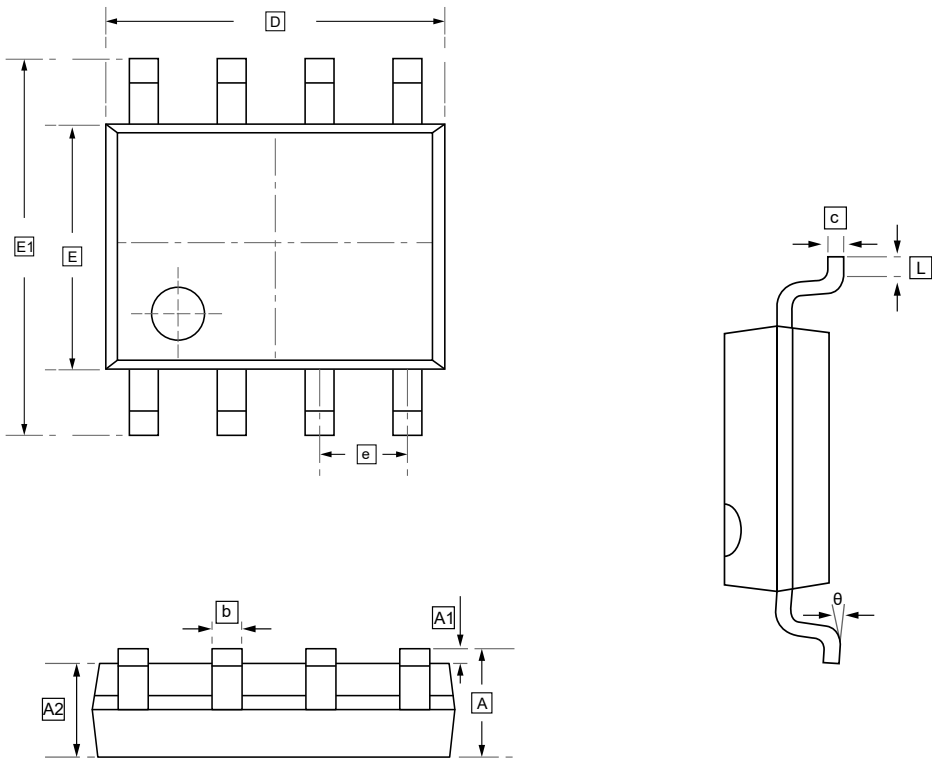
$C_i$  is required when regulator is located an appreciable distance from power supply filter.

$C_o$  is not needed for stability , however, it does improve transient response.

Since  $I_{ADJ}$  is controlled to less than 100μA, the error associated with this term is negligible in most applications.



8.1SOP-8 Package Outline Dimensions

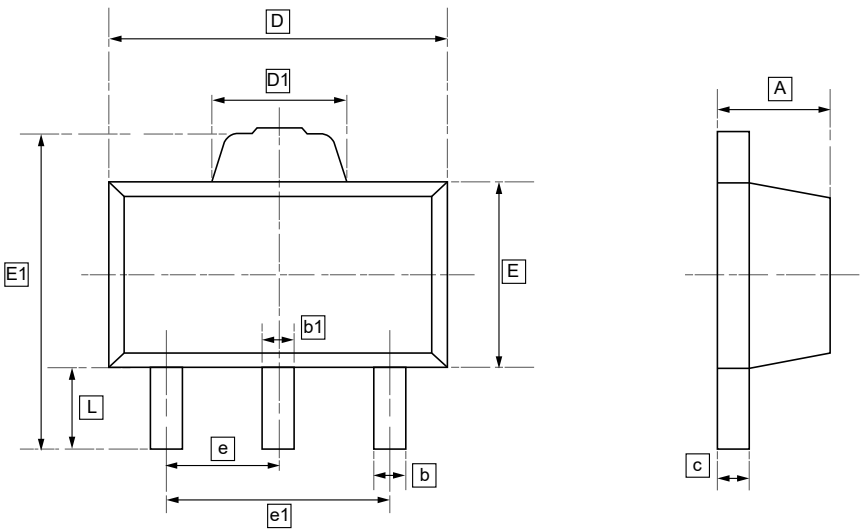


DIMENSIONS (mm are the original dimensions)

| Symbol | A     | A1    | A2    | b     | c     | D     | E     | E1    | e     | L     | θ  |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| Min    | 1.350 | 0.000 | 1.350 | 0.330 | 0.170 | 4.700 | 3.800 | 5.800 | 1.270 | 0.400 | 0° |
| Max    | 1.750 | 0.100 | 1.550 | 0.510 | 0.250 | 5.100 | 4.000 | 6.200 | BSC   | 1.270 | 8° |



8.2SOT-89-3 Package Outline Dimensions

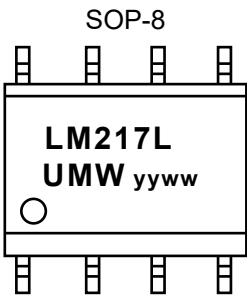
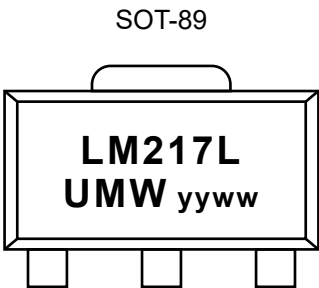


DIMENSIONS (mm are the original dimensions)

| Symbol | A     | b     | b1    | c     | D     | D1    | E     | E1    | e     | e1    | L     |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Min    | 1.400 | 0.320 | 0.360 | 0.350 | 4.400 | 1.400 | 2.300 | 3.940 | 1.500 | 2.900 | 0.900 |
| Max    | 1.600 | 0.520 | 0.560 | 0.440 | 4.600 | 1.800 | 2.600 | 4.250 | TYP   | 3.100 | 1.100 |



9.Ordering information



yy: Year Code  
ww: Week Code

| Order Code    | Marking | Package | Base QTY | Delivery Mode |
|---------------|---------|---------|----------|---------------|
| UMW LM217LD   | LM217L  | SOP-8   | 2500     | Tape and reel |
| UMW LM217LIPK | LM217L  | SOT-89  | 1000     | Tape and reel |



## 10.Disclaimer

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