

AN-1757 LP38693SD-ADJ Evaluation Board

1 Introduction

The LP38693SD-ADJ is a 500mA low-dropout linear regulator whose output voltage can be externally set to any value between 1.25V and 9V using two resistors. The output voltage on this evaluation board is pre-set to 3.30V. This application note gives information about the evaluation board supplied to demonstrate the function of this part.

2 Basic Application Circuit

The basic application circuit shown below provides the component designators used on the evaluation board.

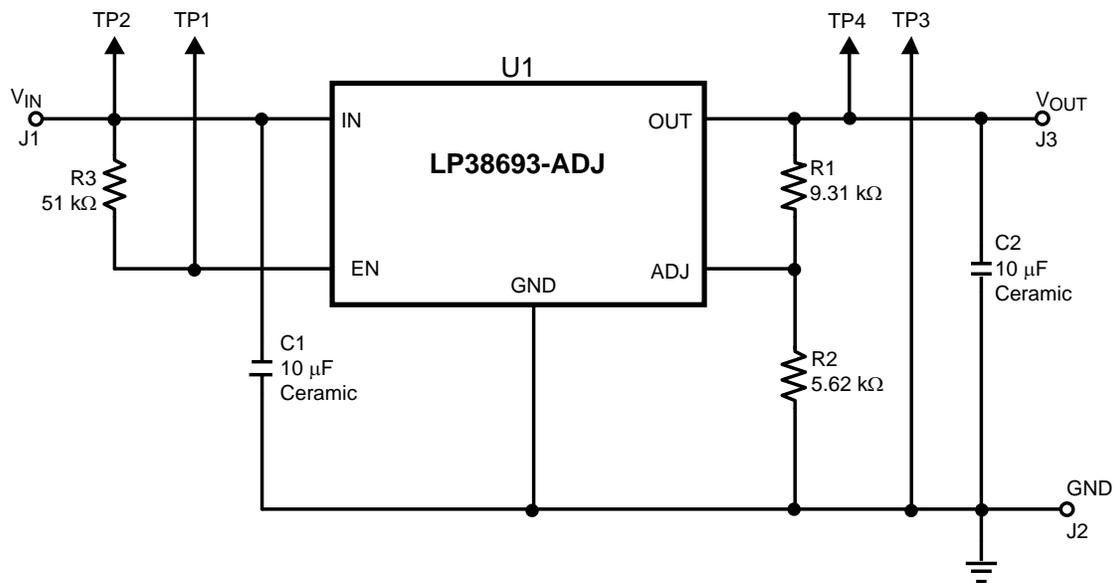


Figure 1. Evaluation Board Basic Application Circuit

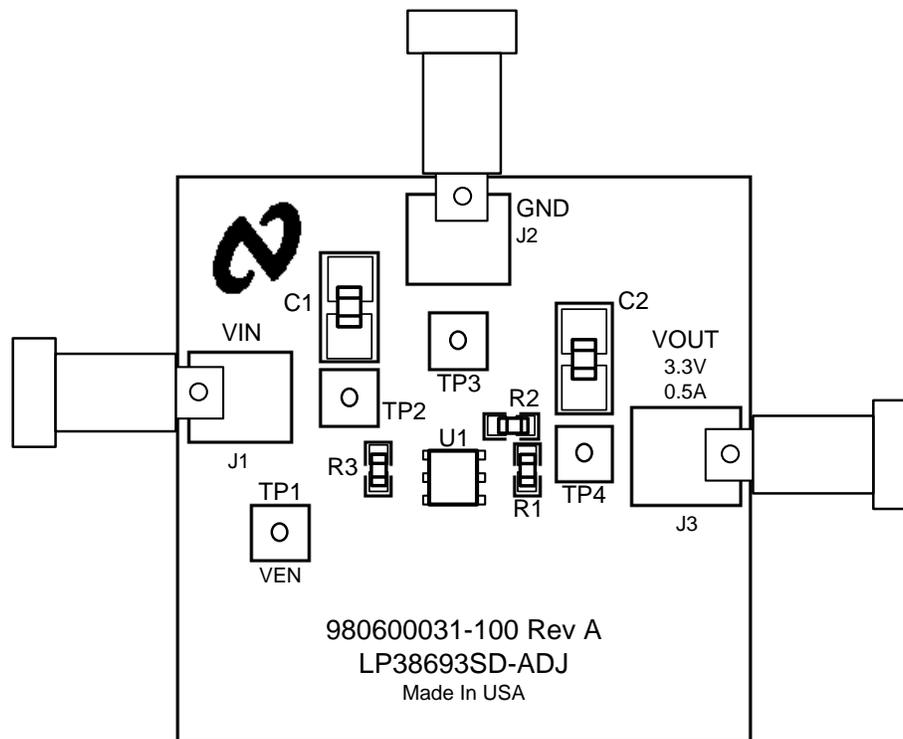


Figure 2. Evaluation Board Component Layout (Top View)

3 Setting the Output Voltage

The output voltage is set using the two external resistors R1 and R2:

$$V_{OUT} = V_{ADJ} \times (1 + (R1/R2)) \quad (1)$$

It can be assumed that $V_{ADJ} = 1.25V$.

The value of R2 is required to be no more than 12 k Ω to ensure that the minimum output load of 100 μA is established. On the LP38693SD-ADJ evaluation board, R2 is 5.62 k Ω and R1 is 9.31 k Ω .

$$V_{OUT} = 1.25V \times (1 + (9310\Omega/5620\Omega)) \quad (2)$$

$$V_{OUT} = 1.25V \times (2.656) = 3.3V \quad (3)$$

4 Component List

The following table shows the component list. Higher voltage rated capacitors may be substituted, but only X5R or X7R dielectric types may be used.

Table 1. Component List

| ID | Description | Mfgr Part Number |
|-----------------------|---|--|
| PCB | PC Board | 551600031-001 |
| U1 | Low DropOut Voltage Regulator | Texas Instruments LP38693 |
| TP1, TP2, TP3, TP4 | Turret Terminal Mounting Hole Dia :0.072in | KEystone 1573-2 NEWARK 97H6311 |
| J1 | Banana jack, V_{IN} - RED | Emerson Network Power 108-0902-001 Digi-Key J151-ND |
| J2 | Banana jack, GND - BLACK | Emerson Network Power 108-0903-001 Digi-Key J152-ND |
| J3 | Banana jack, V_{OUT} - BLUE | Emerson Network Power 108-0910-001 Digi-Key J155-ND |
| R1 | Resistor, 0805, 9.31 k Ω , $\pm 1\%$ | Yageo 9C08052A9311FKHFT Digi-Key 311-9.31KCCT-ND |
| R2 | Resistor, 0805, 5.62 k Ω , $\pm 1\%$ | Yageo 9C08052A5621FKHFT Digi-Key 311-5.62KCCT-ND |
| R3 | Resistor, 0805, 51 k Ω , $\pm 5\%$ | Yageo 9C08052A5102JLHFT Digi-Key 311-51KACT-ND |
| C1, C2 | Capacitor, Ceramic, 1210, 10 uF, 10V, X7R | Taiyo-Yuden #LMK325BJ106MN Digi-Key 587-1469-1-ND |

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