

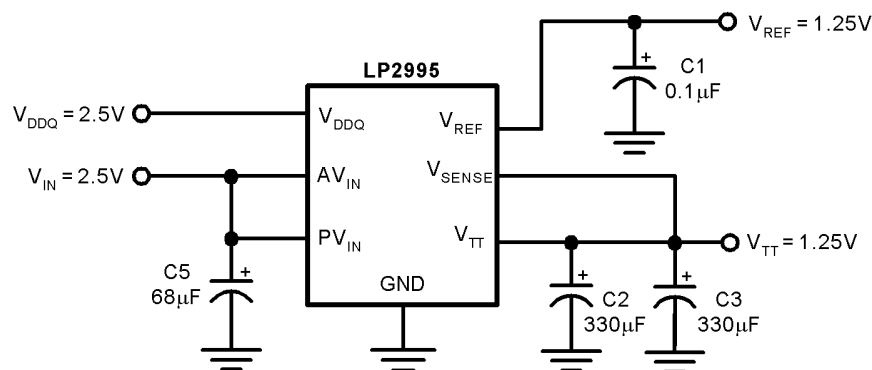
## AN-1241 LP2995 Evaluation Board

### 1 Introduction

The LP2995 evaluation board is designed to provide the design engineer with a fully functional prototype system in which to evaluate the LP2995 in both a static environment and with a complete memory system. There are two versions of the board, while identical in functionality they differ in the package implemented, either an SO-8 or LLP-16 LP2995 is used. This document contains information regarding the evaluation board. For more information regarding the LP2995, see the device-specific data sheet.

### 2 Schematic

The following schematic was used to create the layout.



**Figure 1. Schematic**

**Table 1. Bill Of Materials (BOM)**

Name	Value	Description	Manufacturer	Model Number
U1		LP2995 DDR Linear Regulator	Texas Instruments	LP2995M or LP2995LQ
C1	0.1 µF	1206 Ceramic Capacitor X7R 25V	Vishay Vitrammon	VJ1206Y104KXXAT
C2	330 µF	6.3 V Electrolytic Radial FC Series	Panasonic	EEU-FC0J331S
C3	330 µF	6.3 V Electrolytic Radial FC Series	Panasonic	EEU-FC0J331S
C4		Not Connected		
C5	68 µF	6.3 V Electrolytic Radial FC series	Panasonic	EEU-FC0J680

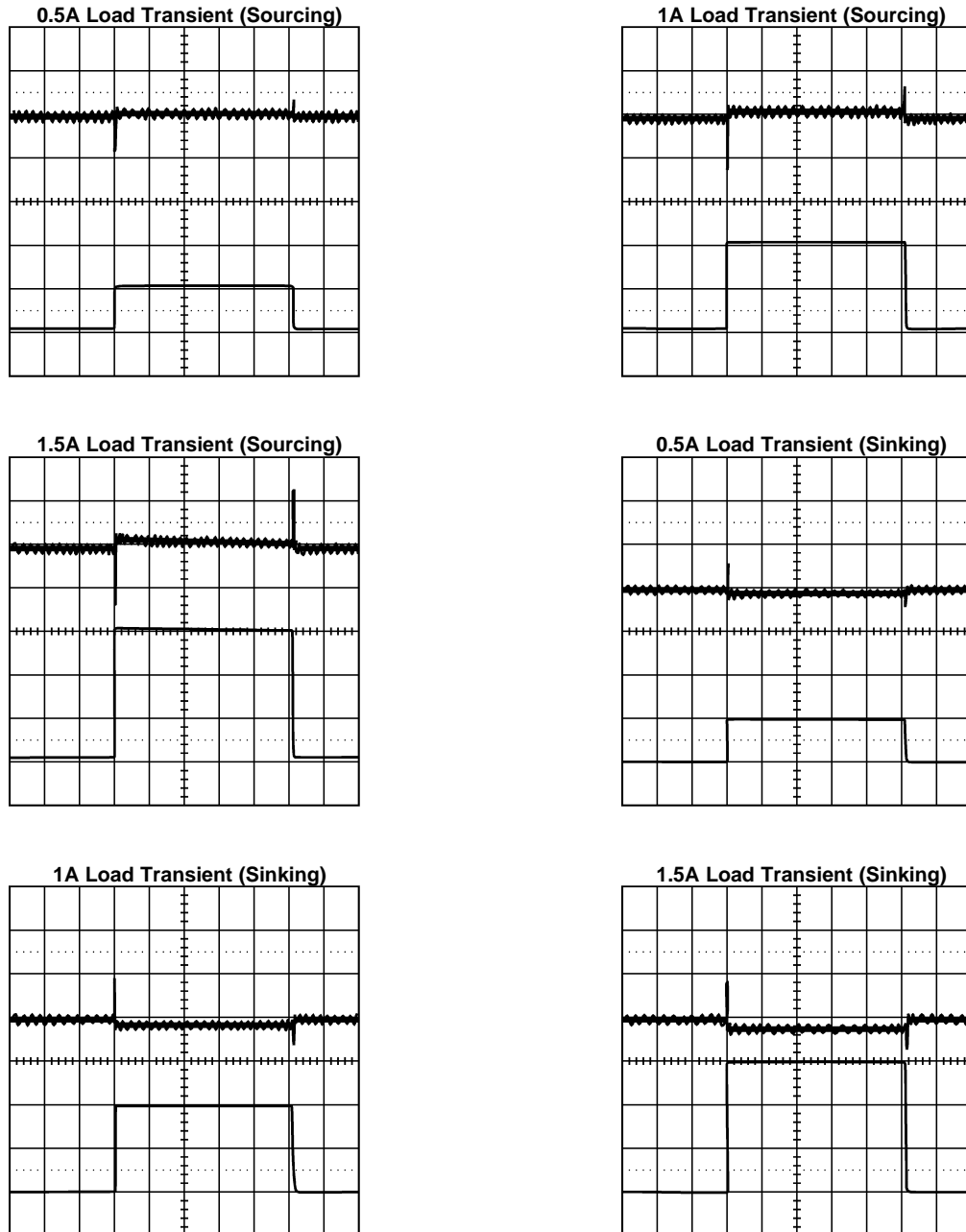
### 3 Application

The LP2995 evaluation board can be used immediately in either a static test environment to check functionality or in a memory termination scheme on a motherboard. In either implementation the following steps should be taken to ensure correct operation:

1. Connect leads from the evaluation board. The board layout has been designed to allow banana jack sockets to be directly soldered.
2.  $V_{IN}$  should be connected to a 2.5 V power supply. This pad connects both the  $AV_{IN}$  and  $PV_{IN}$  pins of the LP2995.
3. Two GND pads have been provided for ease of use. Either is sufficient for grounding of the board.
4. The  $V_{DDQ}$  input provides the internal divide by two reference voltage. Both  $V_{REF}$  and  $V_{TT}$  will track this internal voltage, nominally a 2.5V will be applied.
5. The  $V_{REFOUT}$  pad is the output for the  $V_{REF}$  from the LP2995 after being bypassed by a ceramic capacitor. This can be connected either to a multimeter for confirmation or directly to the memory controller and DIMMS.
6. The remaining two pads are for the force and sense leads of the  $V_{TT}$  output. These should be connected directly to the termination plane or a multimeter if interested in verification. The output will be regulated where the  $V_{SENSE}$  leads connect to the  $V_{TT}$  leads permitting the connection to a motherboard without suffering from large resistance drops.

## 4 Performance

The following series of scope plots shows the performance of the LP2995 evaluation board when it is subjected to various load tests. On each of the six scope plots there are two traces. The upper trace is the  $V_{TT}$  output voltage that has been AC coupled with a scale of 20 mV per division. The lower trace is the output current with a scale of 500 mA per division. All the load transients begin from an initial condition of zero current and show magnitude. Please refer to the title to determine whether the current flow is into (sinking) or out of (sourcing) the  $V_{TT}$  pin. The time scale for all the plots is 2mS per division.



The LP2995 has been designed to accommodate several different capacitor options to allow the designer to optimize the solution for the specific application. For most desktop systems large aluminum electrolytic capacitors will be used for their low cost. However, in height limited situations such as laptops fewer high performance capacitors might be implemented such as specialty polymers. The table below lists some of the capacitors that can be used and a vendor that offers that product line.

Capacitor Series	Vendor	Vendor Phone Number
Osccon	Vishay	(207) 324-4140
SP	Panasonic	(714) 373-7857
MLCC	Taiyo Yuden	(800)-348-2496
Aluminum	Panasonic	(714) 373-7857

## 5 Board Layout

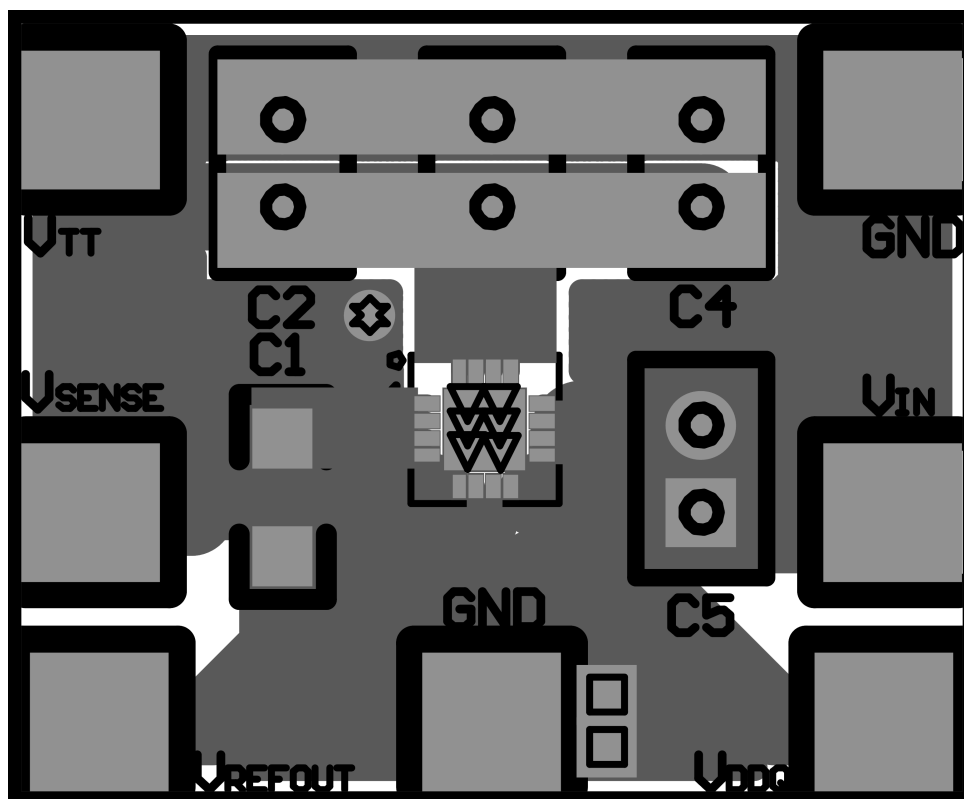


Figure 2. LLP Top Side

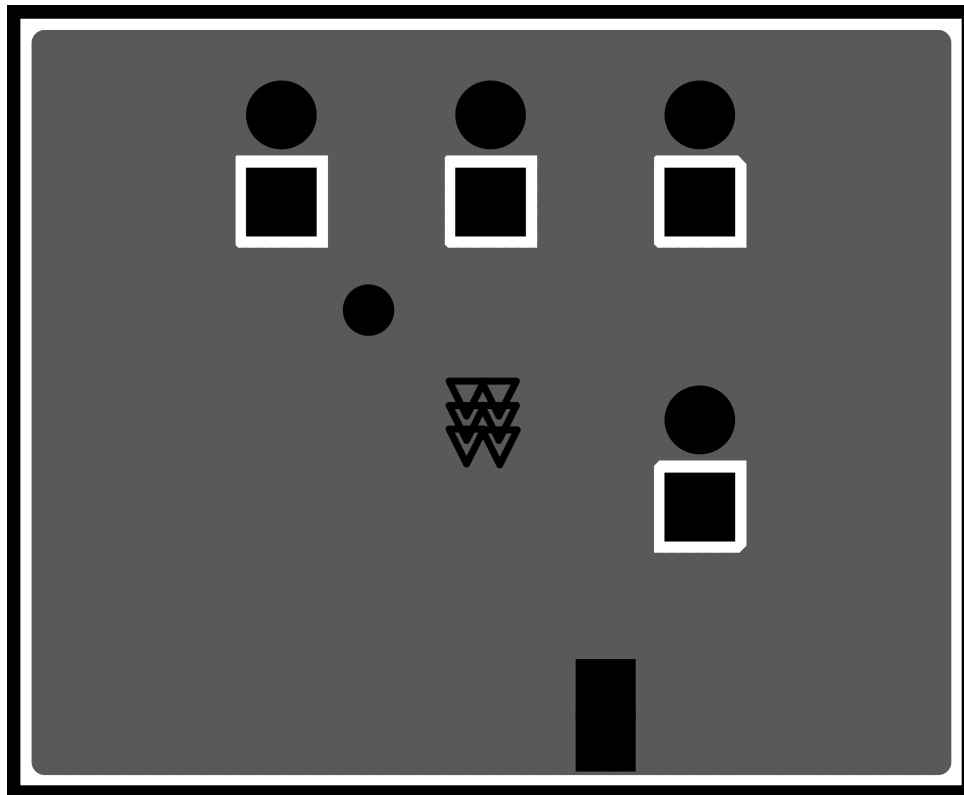


Figure 3. LLP Bottom Side

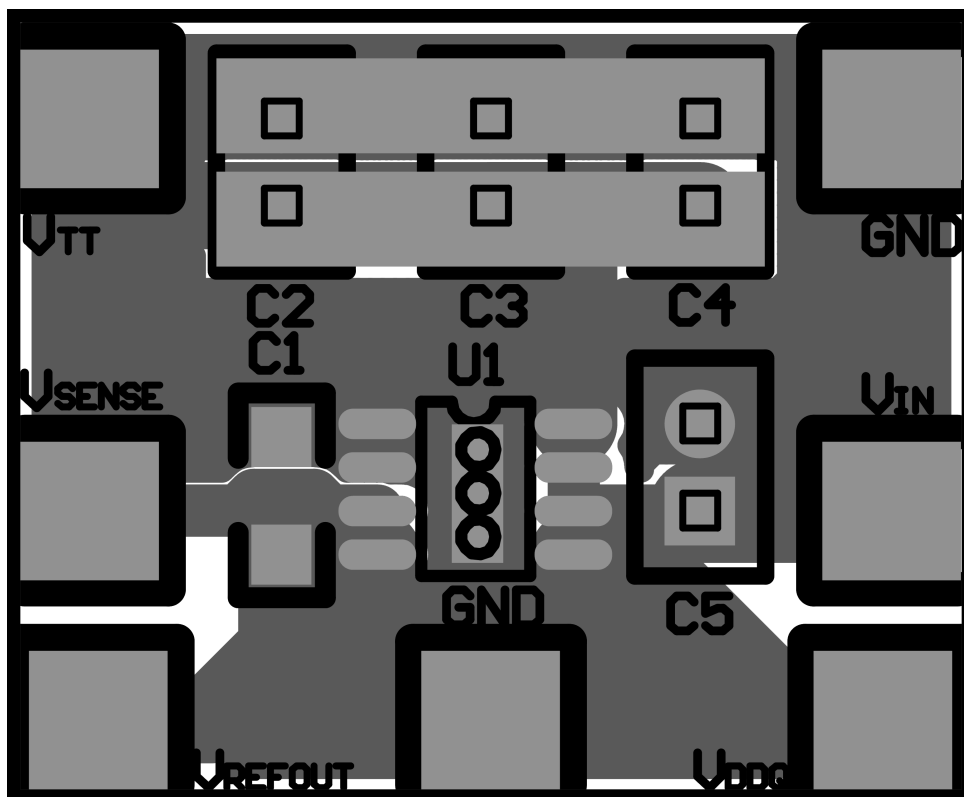


Figure 4. SO-8 Top Side

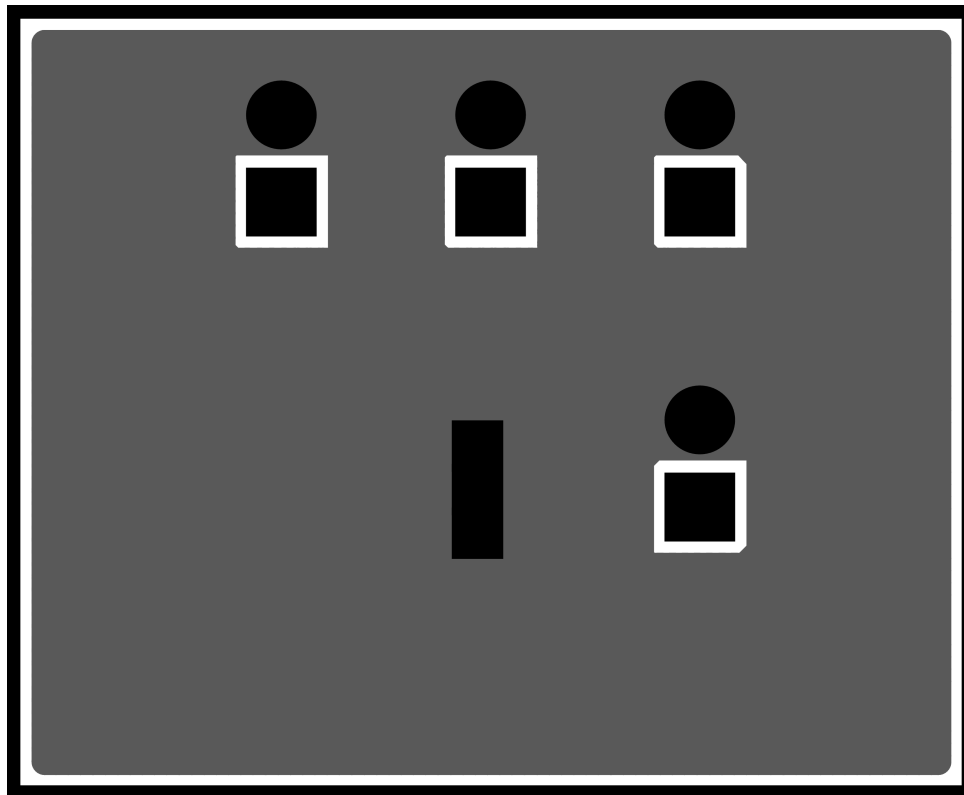


Figure 5. SO-8 Bottom Side

<b>Information</b>	<b>SO-8 Board</b>	<b>LLP-16 Board</b>
Board Material	FR4	FR4
Size	0.9 x 1.1 inches	0.9 x 1.1 inches
Board Thickness	0.062 inch	0.062 inch
Layers	2	2
Copper Thickness	1 oz	1 oz
Plating	HASL	HASL
Thermal Vias	3	6
Thermal Vias Size	25 mil	10 mil
Board Thickness	0.062 inch	0.062 inch

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