

ACS709 Evaluation Board Getting Started Guide

Dear Customer:

Thank you for purchasing an Allegro® MicroSystems, Inc., product evaluation kit. This kit is intended for evaluation use only, and is not intended for use in a production environment.

The instructions in this kit are designed for use with the following product evaluation boards:

- *ACS709, PN: 85-0444-001, Rev. 1*

This document includes:

- *Top side layout of the evaluation board*
- *Bottom side layout of the evaluation board*
- *Electrical schematic of the evaluation board*
- *Basic instructions for completing a fault test using the evaluation board*

Additional information may be available on the Allegro MicroSystems [website page for the ACS709](#):

- *Bill of materials of the evaluation board*
- *Gerber files of the evaluation board*
- *Datasheet for the ACS709*

This document provides a basic guide for providing power and signal to the evaluation board and product. The datasheet provides the specific details about the product to best understand how the product can be in a typical application. If you should need any further assistance please call 1-508-854-5428 or contact the field application engineer for your area by visiting the Design Center > [Technical Assistance](#) link on the Allegro MicroSystems website.

– Allegro MicroSystems

Introduction

This evaluation board enable verification of the ACS709 functionality by simply powering on the board and connecting an adjustable current source from board contacts IP+ to IP-.

The test points (TP) are identified in the following table. Refer to the top-side layout diagram for locations on the board.

Test Point Name	Device Pin Name	Function
TP1	FAULT_EN	Must be high to enable fault algorithm
TP2	VOC	Sets fault threshold
TP3	VCC	Regulated voltage: 5 V with J2 open 3.3 V with J2 closed
TP4	FAULT	Overcurrent fault flag output
TP5	VIOUT	Analog voltage output; proportional to current
TP6	VFILTER	Filters the output of the device
TP7	VZCR	Zero-ampere current reference
TP8	GND	Ground
TP9	VIN	Board supply voltage: $V_{CC} + 3\text{ V} < V_{IN} < 25\text{ V}$

Creating a Fault Condition:

Resistors R2 (332 k Ω) and R3 (178 k Ω) on the evaluation board create a resistive voltage divider that sets the overcurrent fault threshold, input to the VOC pin. The installed resistor values set V_{OC} to be about $\frac{1}{3} \times V_{CC}$.

- For unidirectional current sensing this means that a fixed fault threshold will occur at about:

- 32 A for the ACS709LLFTR-20BB-T (Sens 56 mV/A)
- 64 A for the ACS709LLFTR-35BB-T (Sens 28 mV/A)

In either case, the fault is tripped independently of V_{CC} .

- For bidirectional current sensing this means that a fixed fault threshold will occur at about:

- $\pm 32\text{ A}$ for the ACS709LLFTR-20BB-T (Sens 56 mV/A)
- $\pm 64\text{ A}$ for the ACS709LLFTR-35BB-T (Sens 28 mV/A)

To set a different current fault threshold, users can either apply a voltage to VOC pin from an external source or place a potentiometer (R10) on the board. Refer to the Functional Description section of the ACS709 datasheet for detailed information about calculating V_{OC} for the required fault level.

When the FAULT_EN pin is high, and the current threshold is exceed, a fault condition will occur. LED D1 will turn on when the fault is latched. See the datasheet for more details on the fault algorithm, as well as how to reset the fault using FAULT_EN.

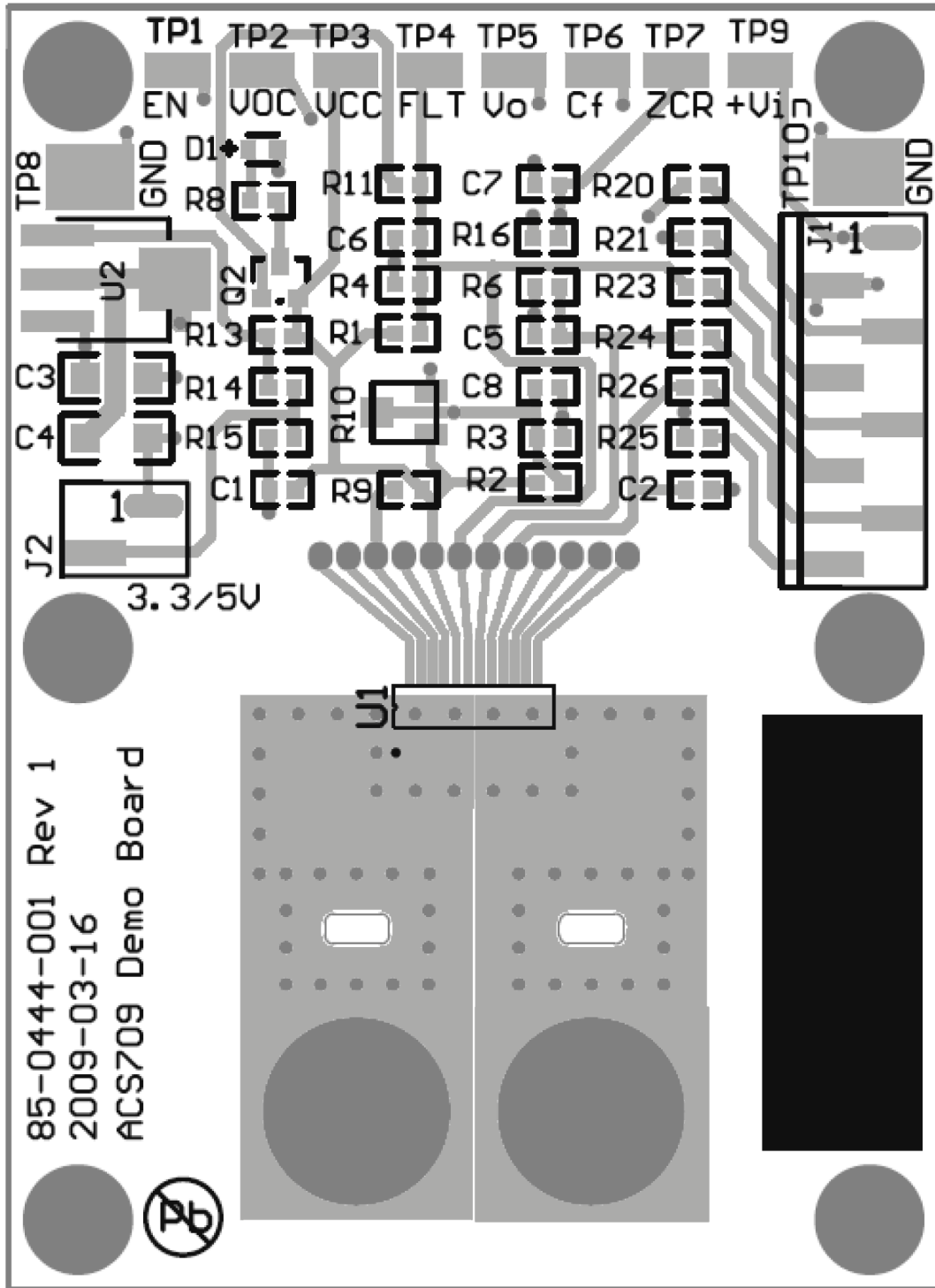


Figure 1. Top-side layout of the evaluation board

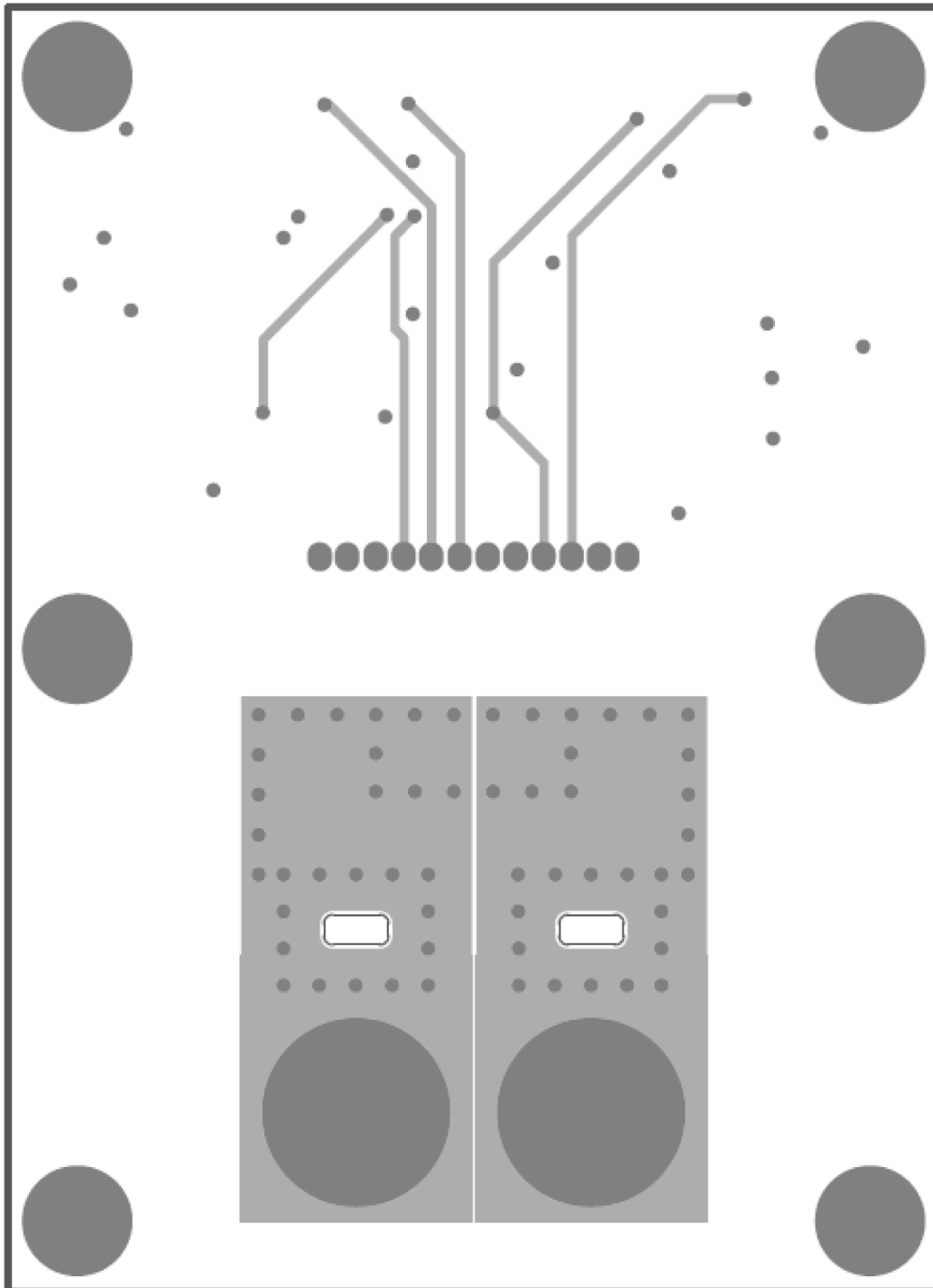
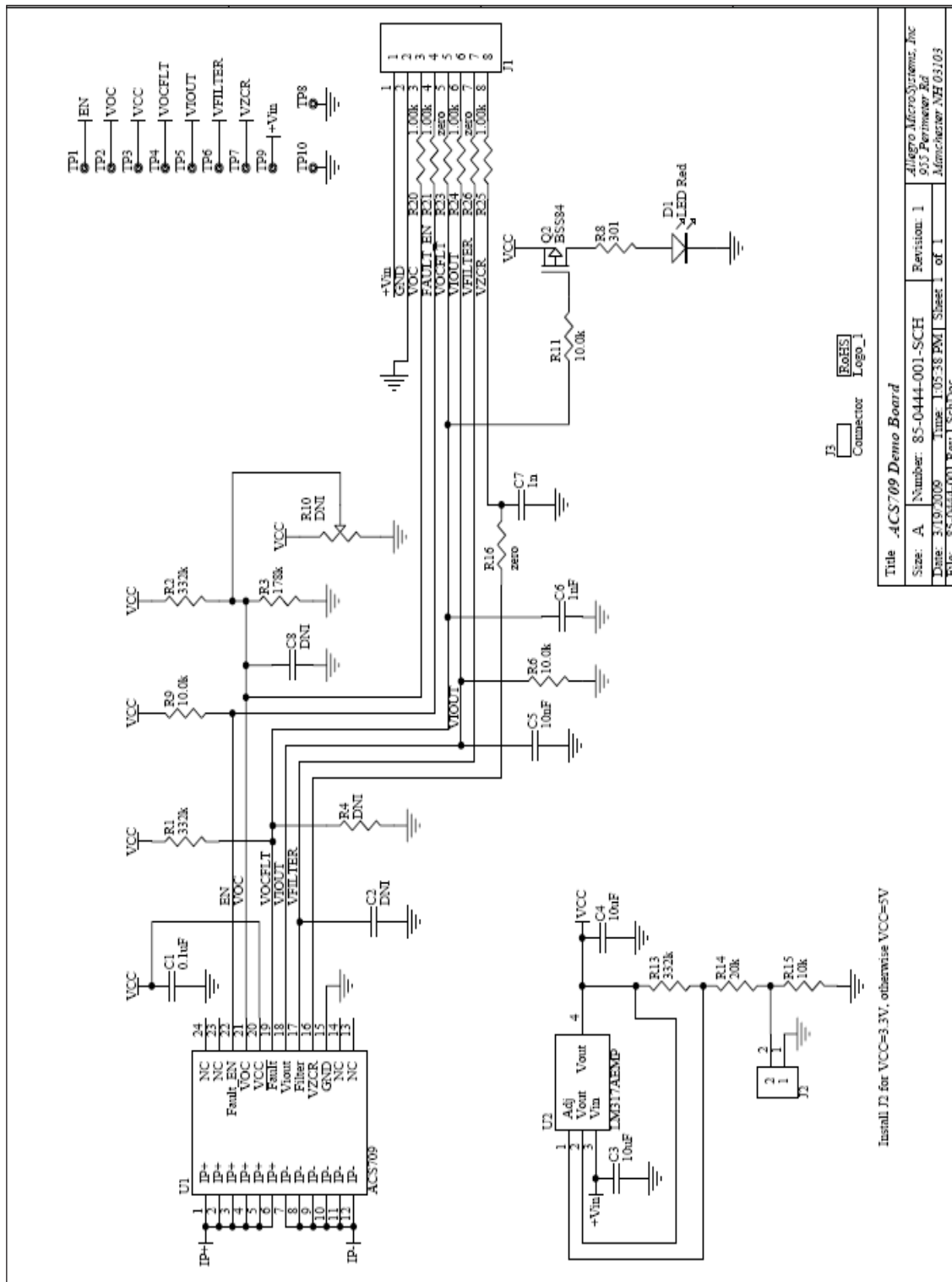


Figure 2. Bottom-side layout of the evaluation board



Title ACS709 Demo Board	
Size: A	Number: 85-0444-001-SCH
Date: 3/19/2009	Time: 1:05:38 PM
File: 85-0444-001 Rev 1.SCHDoc	Sheet 1 of 1
Revision: 1	
Allegro MicroSystems, Inc	
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Millsborough, NH 03103	

Figure 3. Electrical schematic of the evaluation board

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