LX13045A EVALUATION BOARD USER'S GUIDE

LX13045A 1.3MHz PWM Step Down Regulator
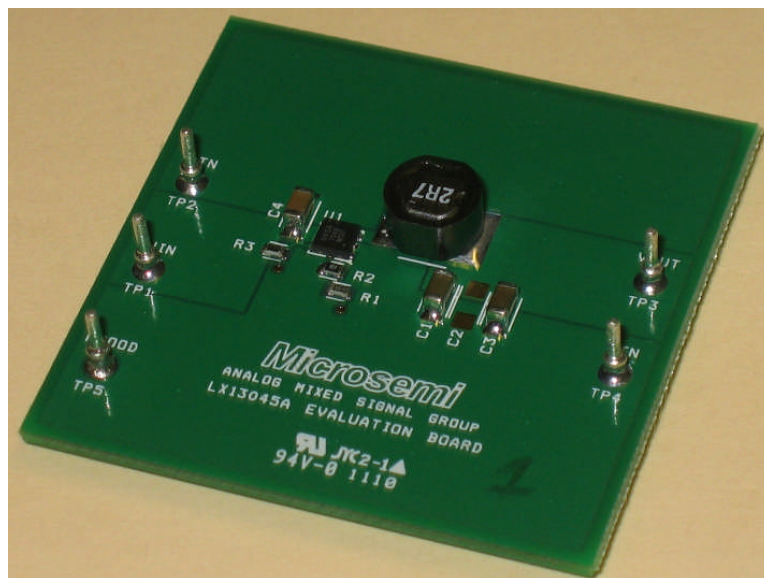

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Microsemi
INTEGRATED PRODUCTS

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OVERVIEW

The LX13045A is a current mode synchronous PWM Buck Regulator with integrated Power Good Indicator. The switching transistors and current sense circuitry are integrated into the part, leaving only a few low cost external components for a complete solution. The PWM functions in a peak current regulation mode using the internal gm amplifier's error signal to determine the peak switch current for each cycle. Integrated slope compensation is added to provide stable operation at high duty cycles. An internal current limit detector prevents the switch current from exceeding the over current threshold level.

Tight output voltage regulation is maintained with an 800mV internal reference. +/- 2.0% regulation tolerance is achievable for all line, load, and temperature conditions.

The regulator is capable of providing load current up to 2.0A and has no minimum load requirement for stable operation. Current limit senses on a cycle-by-cycle basis.

The LX13045A operation supply voltage range is from 4.5V to 5.5V. Features include: UVLO at V_{IN} < 3.7V, soft start inrush current limiting, output overvoltage protection, and thermal shutdown.

EVALUATION BOARD OPERATION

The LX13045A evaluation board as configured by the factory is designed to provide a 1.2V output voltage at up to 2.0 Amp (with a nominal 5V input). For alternate voltage outputs, change the value of R1 based on the following formula:

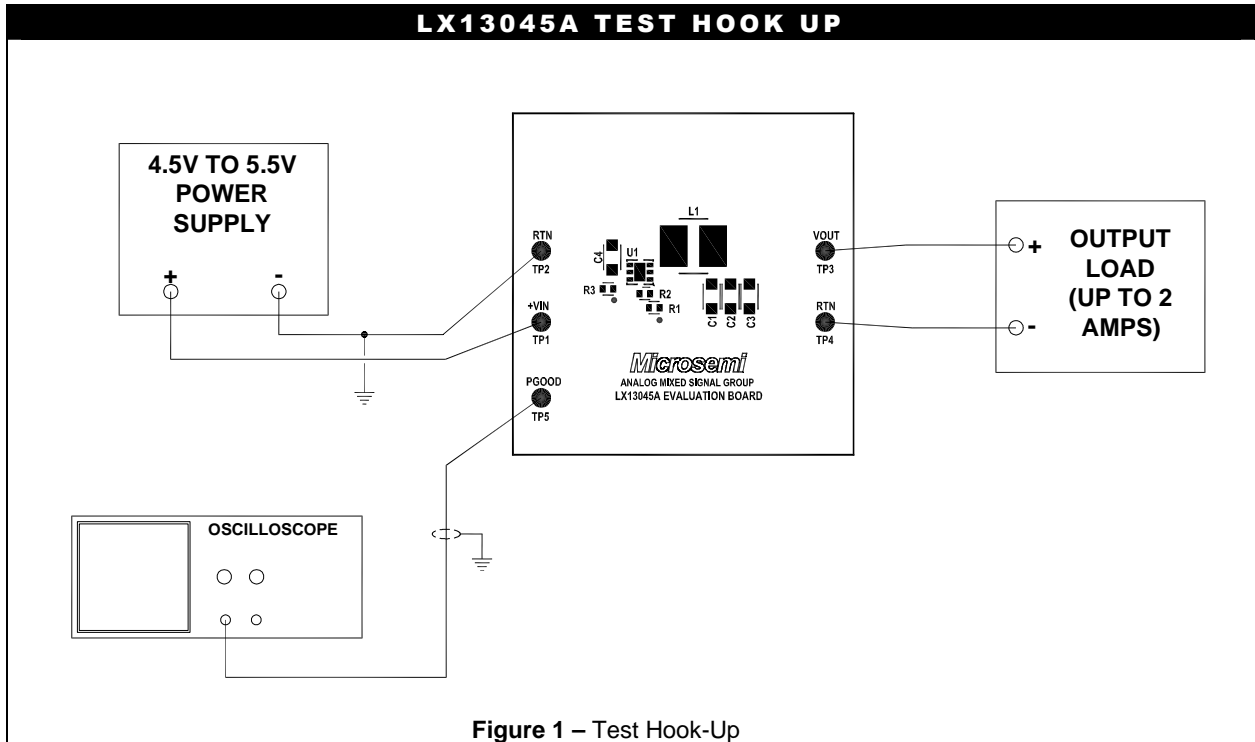$$R1 = \frac{R2(V_{OUT} - 0.8)}{0.8}$$

Where: R2 = 10.0k Ohm (factory installed value).

Output voltages of 0.8V to 3.6V may be achieved without further circuit modification.

The test point descriptions for the evaluation circuit are summarized in Table 1, followed by a suggested test hookup diagramed in Figure 1. Please refer to this table and diagram for evaluation board setup.   The factory installed active and passive components list can be found in Table 2. Following the component list you will find the PCB silkscreen in Figure 2, PCB Artwork in Figures 3 and 4, and the circuit schematic in Figure 5.

Table 1 – Evaluation Board Test Points	
TP1	Input Power (4.5V to 5.5V) Positive Connection; connect to external 5V supply capable of 2A min. output.
TP2	Input Power Return; connect to external 5V supply return.
TP3	Regulated Output Positive Connection; connect to external load
TP4	Regulated Output Return; connect to external load return.
TP5	Power Good Indicator; evaluation board provides 47k pull-up to V_{IN}. Provides a logic high signal (high = V_{IN}) when output voltage is within -9%, +4% of regulated output voltage.

LX13045A TEST HOOK UP

Figure 1 – Test Hook-Up

LX13045A EVALUATION BOARD COMPONENT LIST

TABLE 2 – EVALUATION BOARD BILL OF MATERIALS

Part Description	Manufacturer & Part #	Reference Designators	Qty
IC, Step Down Regulator	**Microsemi** LX13045ACLD	U1	1
Capacitor, Ceramic, 22uF, 10 Volt, 20%, 1206 Type SMT	Panasonic ECJ3YB1A106M	C1, C3	2
Capacitor, Ceramic, 10uF, 10 Volt, 20%, 1206 Type SMT	Panasonic ECJ3YB1A106M	C4	1
Inductor, 2.7uH, 3.1 Amp Shielded SMD Power Inductor	Murata Power Solutions 24S2R7	L1	1
Resistor, 5.11K Ohms, 1/16 Watt, 1% 0603 Type SMD	Panasonic ERJ3EKF5111	R1	1
Resistor, 10.0K Ohms, 1/16 Watt, 1% 0603 Type SMD	Panasonic ERJ3EKF1002	R2	1
Resistor, 47k Ohms 1/10 Watt, 5% 0603 Type SMD	Panasonic ERJ3GEYJ473V	R3	1

LX13045A EVALUATION BOARD SILKSCREEN

Figure 2 – Silkscreen Top

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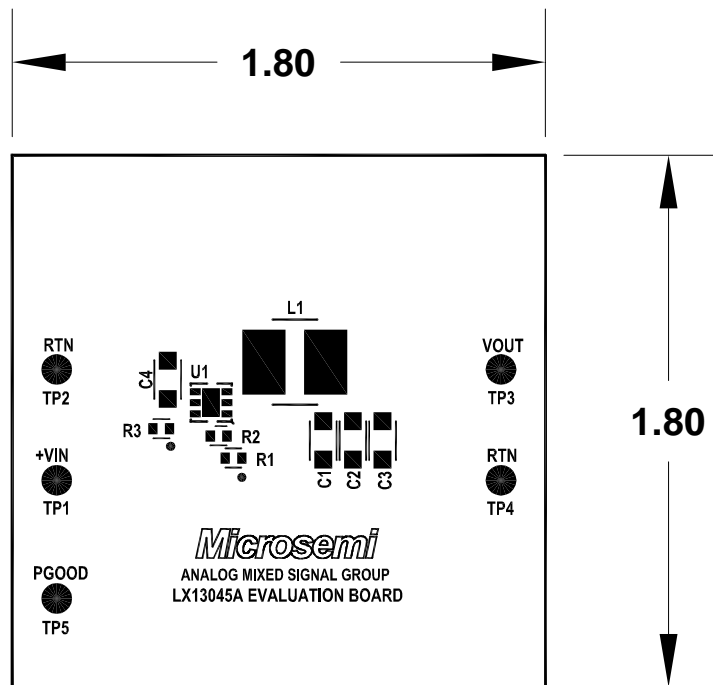11861 Western Avenue, Garden Grove, CA. 92841, 714-898-8121, Fax: 714-893-2570

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LX13045A EVALUATION BOARD PCB ARTWORK
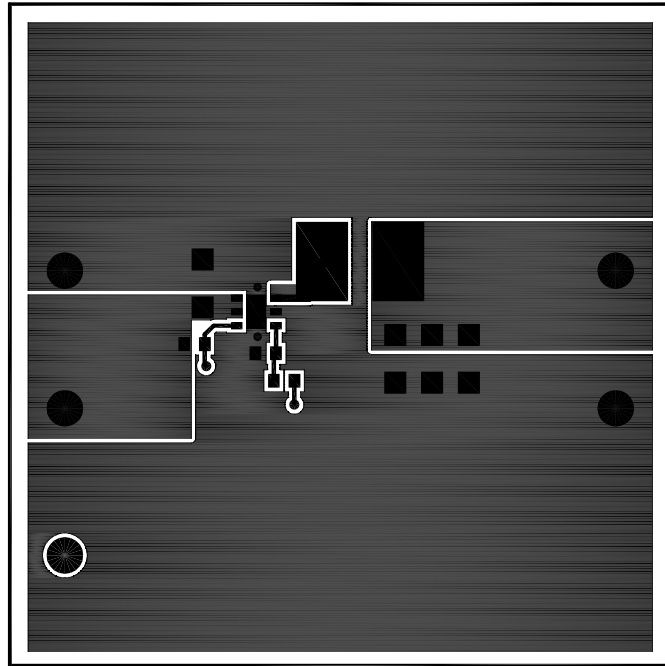

Figure 3 – PCB Top Layer

Figure 4 – PCB Bottom Layer

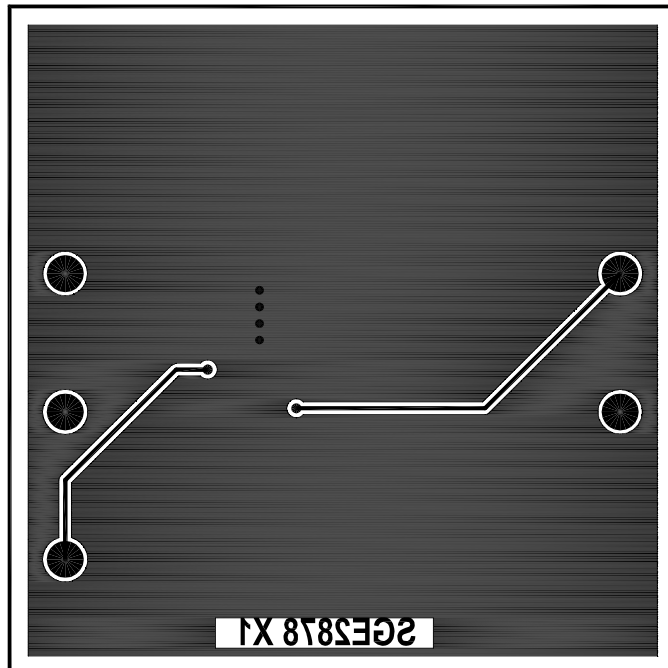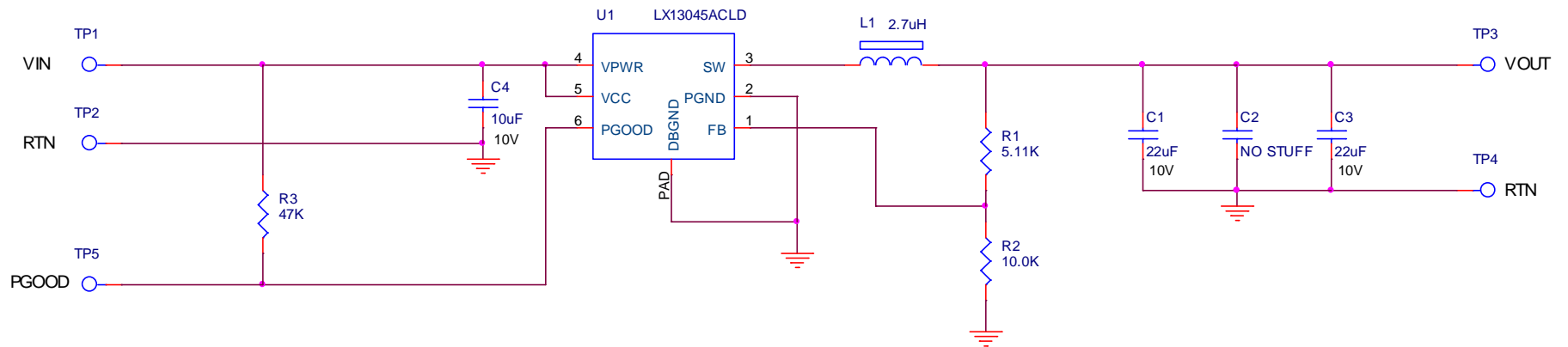## LX13045A EVALUATION BOARD SCHEMATIC

Figure 5 – LX13045A Evaluation Board Schematic