MAX40004 Evaluation Kit

Evaluates: MAX40002–MAX40005

General Description

The MAX40004 evaluation kit (EV kit) is a fully assembled and tested PC board that evaluates the MAX40004ANS02 single comparator with open-drain output. The MAX40004ANS02 operates from a V_{CC} supply between 1.7V to 5.5V, comes with an internal reference voltage of 1.222V, and has a wide 0.1V to 5.5V input voltage (IN) range. This EV kit demonstrates the MAX40004ANS02 in an ultra-small, 0.76mm x 0.76mm, 4-bump wafer-level package (WLP) with 0.35mm bump spacing.

This EV kit is configured to evaluate the 4-bump WLP (installed), open-drain output, but can be used to evaluate the entire MAX40002–MAX40005 family with a 4-bump wafer-level package (WLP). For the push-pull output versions (MAX40004–MAX40005), users only need to remove pullup resistor R1.

Features

- 0.1V to 5.5V Input Voltage Range
- 1.7V to 5.5V External Reference Range (MAX40002ANS–MAX40005ANS)
- 1.7V to 5.5V V_{CC} Range with Internal Reference (MAX40002ANS_ _–MAX40005ANS_ _)
  - 0.2V, 0.5V, 0.9V and 1.222V Internal Reference Options Available
- Evaluates 4-Bump WLP Package
- Fully Assembled and Tested

***Ordering Information* appears at end of data sheet.**

Quick Start

Required Equipment

Before beginning, the following equipment is needed:

- Three +5V DC power supplies (V_{CC}/REF, IN, and V_{PU})
- One digital multimeter (DMM)

Procedure

The MAX40004 EV kit is fully assembled and tested. Follow these steps to verify board operation. **Do not turn on the power supply until all connections are completed.**

1) Connect the positive terminal of a DC power supply to the V_{CC} pad and the ground terminal to the GND pad.
2) Connect the positive terminal of a DC power supply to the V_{PU} pad and the ground terminal to the GND pad (MAX40002/MAX40003 only).
3) Connect the positive terminal of a DC power supply to the IN pad and the ground terminal to the GND pad.
4) Turn on the V_{CC} power supply and set it to the desired level.
5) Turn on the V_{PU} power supply and set it to the desired level (MAX40002–MAX40003 only).
6) Turn on the IN power supply and set it to the desired level.
7) Monitor the output using a DMM at the OUT pad, and study its response to varying voltage at IN (refer to Table 1 for more information).

19-8554; Rev 0; 6/16

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Table 1. How Devices Behave Under Various Input Voltage Conditions

PART	V_{REF}	INPUT POLARITY	INPUT VOLTAGE CONDITIONS	ACTION AT OUTPUT
MAX40002, MAX40004	External	Noninverting	$V_{IN} > V_{REF}$	Output goes high
			$V_{IN} > V_{REF}$	Output asserts low
MAX40003, MAX40005		Inverting	$V_{IN} > V_{REF}$	Output goes low
			$V_{IN} > V_{REF}$	Output asserts high
MAX40002, MAX40004	Internal	Noninverting	$V_{IN} > V_{REF\_INT}$	Output goes high
			$V_{IN} > V_{REF\_INT}$	Output asserts low
MAX40003, MAX40005		Inverting	$V_{IN} > V_{REF\_INT}$	Output goes low
			$V_{IN} > V_{REF\_INT}$	Output asserts high

Detailed Description of Hardware

The MAX40004 EV kit is a fully assembled and tested PC board that evaluates the 4-bump WLP MAX40004ANS02 open-drain output comparator. The EV kit can be used to evaluate all other MAX40002-MAX40005 available in a WLP package.

V_{CC}/REF Supply Selection

The V_{CC}/REF pad on the EV kit is used to either supply a 1.7V to 5.5V V_{CC} voltage (internal reference devices) or a 1.7V to 5.5V external reference voltage to the IC. The MAX40004 EV kit can evaluate all devices that come with a 4-bump WLP (refer to the MAX40002–MAX40005 data sheet for more information).

Component Information, PCB Layout, and Schematic

See the following links for component information, PCB layout diagrams, and schematics.

- **MAX40004 EV BOM**
- **MAX40004 EV PCB Layout**
- **MAX40004 EV Schematic**

V_{PU} Pad

The V_{PU} pad on the EV kit is used to connect a pullup supply voltage up to 5.5V for the open-drain output devices (MAX40002–MAX40003) for proper operation. Remove R1 and eliminate V_{PU} if evaluating the push-pull output devices (MAX40004–MAX40005).

Ordering Information

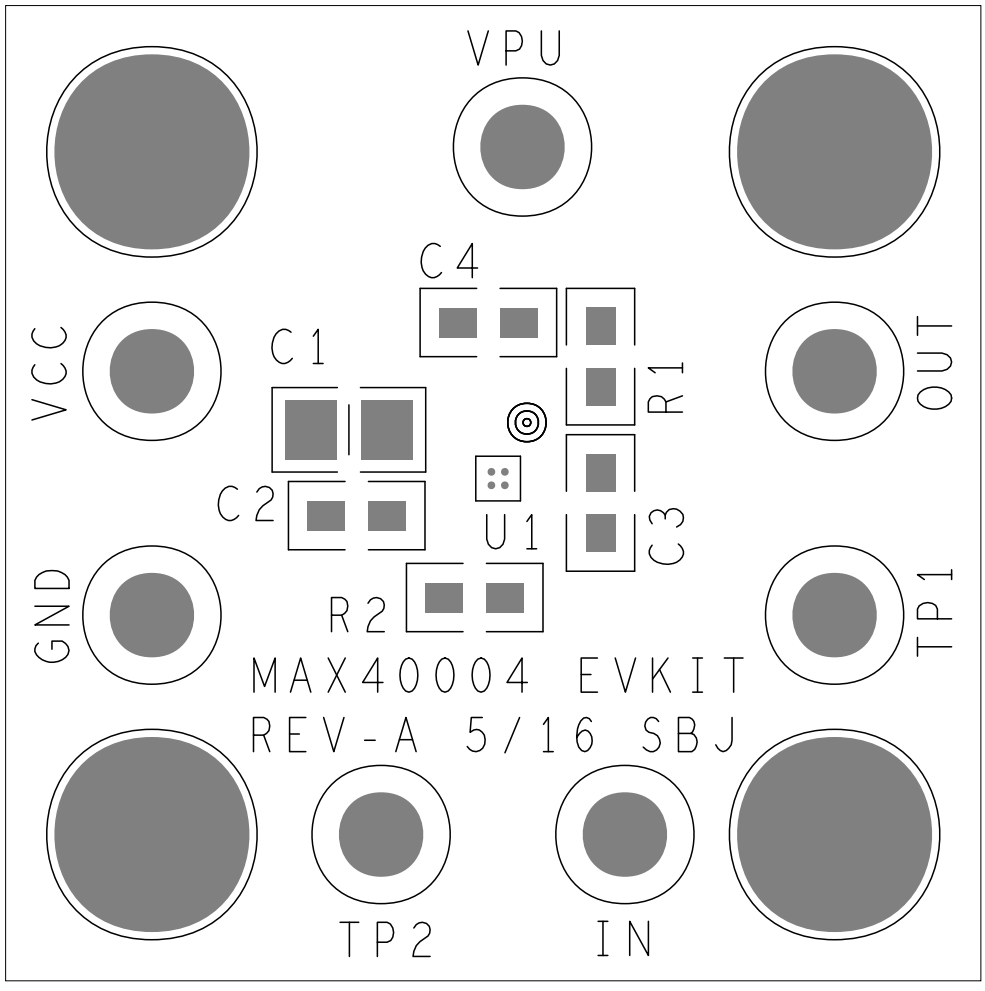
PART	TYPE
MAX40004EVKIT#	EV Kit

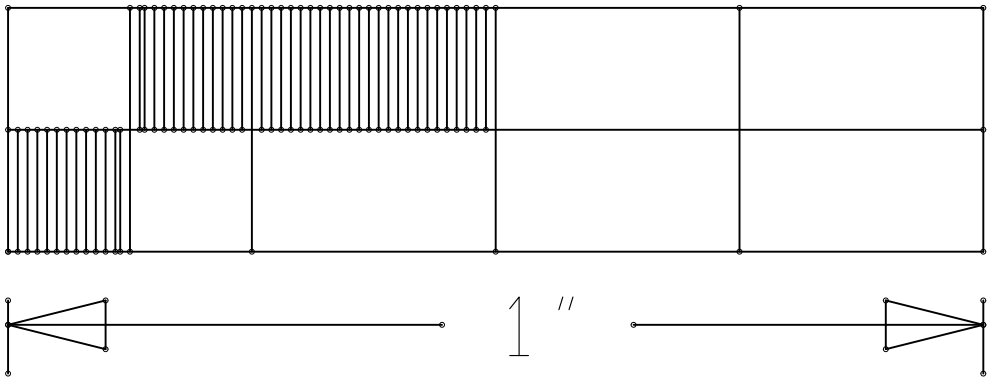
#Denotes RoHS-compliant

Revision History

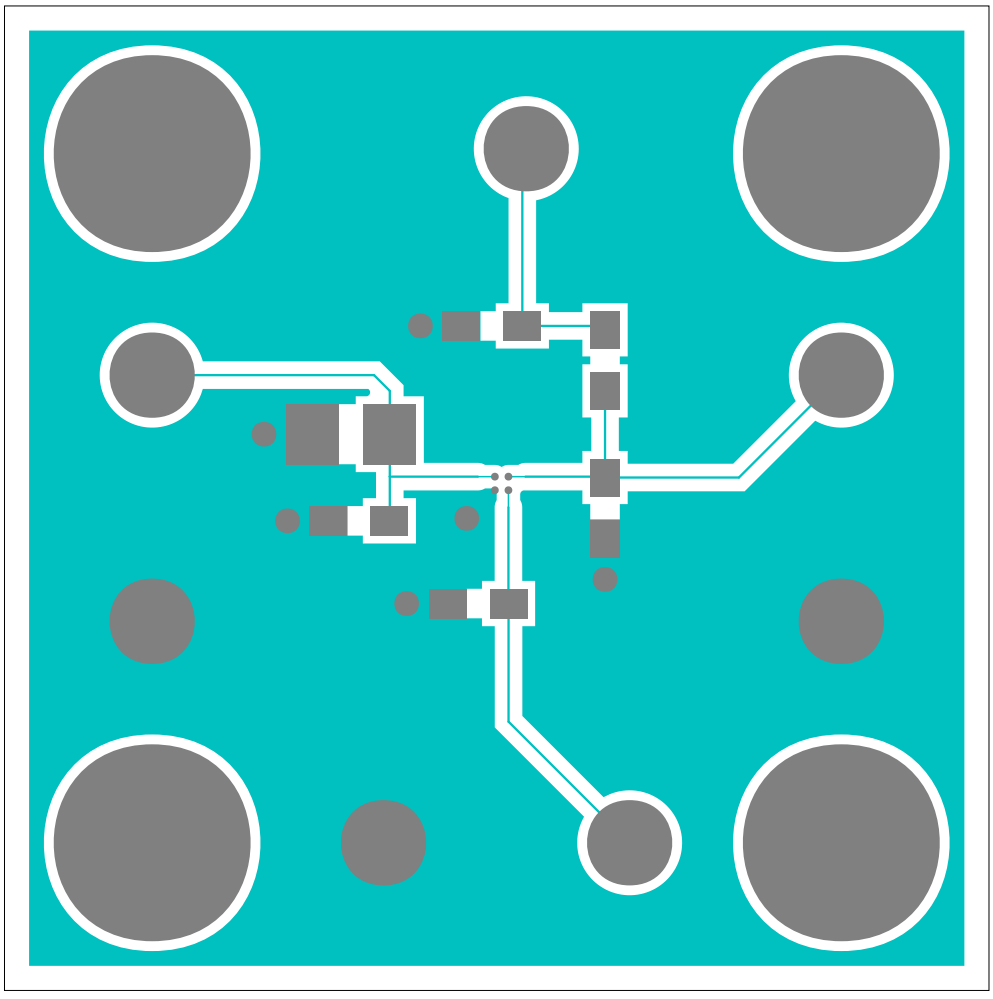
REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	6/16	Initial release	—

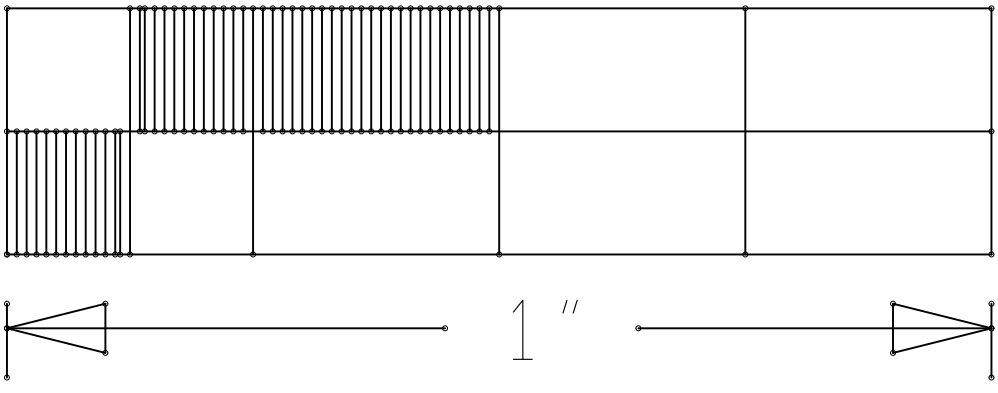
TITLE: Bill of Materials							
DATE: 05/26/2016							
DESIGN: max40004_evkit_a							
NOTE: DNI--> DO NOT INSTALL ; DNP--> DO NOT PROCURE							
ITEM	**REF_DES**	**DNI/ DNP**	**QTY**	**MFG PART #**	**MFCTR**	**VALUE**	**DESCRIPTION**
1	C1	-	1	GRM21BR71A475KA73; LMK212B7475KG-T	MURATA/ TAIYO YUDEN	4.7UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 4.7UF; 10V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R
2	C2, C4	-	2	C1608X7R1E104K080AA	TDK	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 25V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R
3	GND, TP1, TP2	-	3	5006	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
4	IN, OUT, VCC, VPU	-	4	5005	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
5	U1	-	1	MAX40004ANS02+	MAXIM	MAX40004ANS02+	EVKIT PART-IC; COMP; 600NA; 4-BUMP ULTRA-TINY COMPARATOR; PACKAGE OUTLINE: 21-100103; PACKAGE CODE: N40C0+1; WLP4
6	C3	DNP	0	C1608X7R1E104K080AA	TDK	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 25V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R
7	R1, R2	DNP	0	ERA-3ARB104	PANASONIC	100K	RESISTOR; 0603; 100K OHM; 0.1%; 10PPM; 0.1W; THIN FILM
8	PCB	-	1	MAX40004	MAXIM	PCB	PCB Board:MAX40004 EVALUATION KIT
TOTAL			12				





TOP SILKSCREEN





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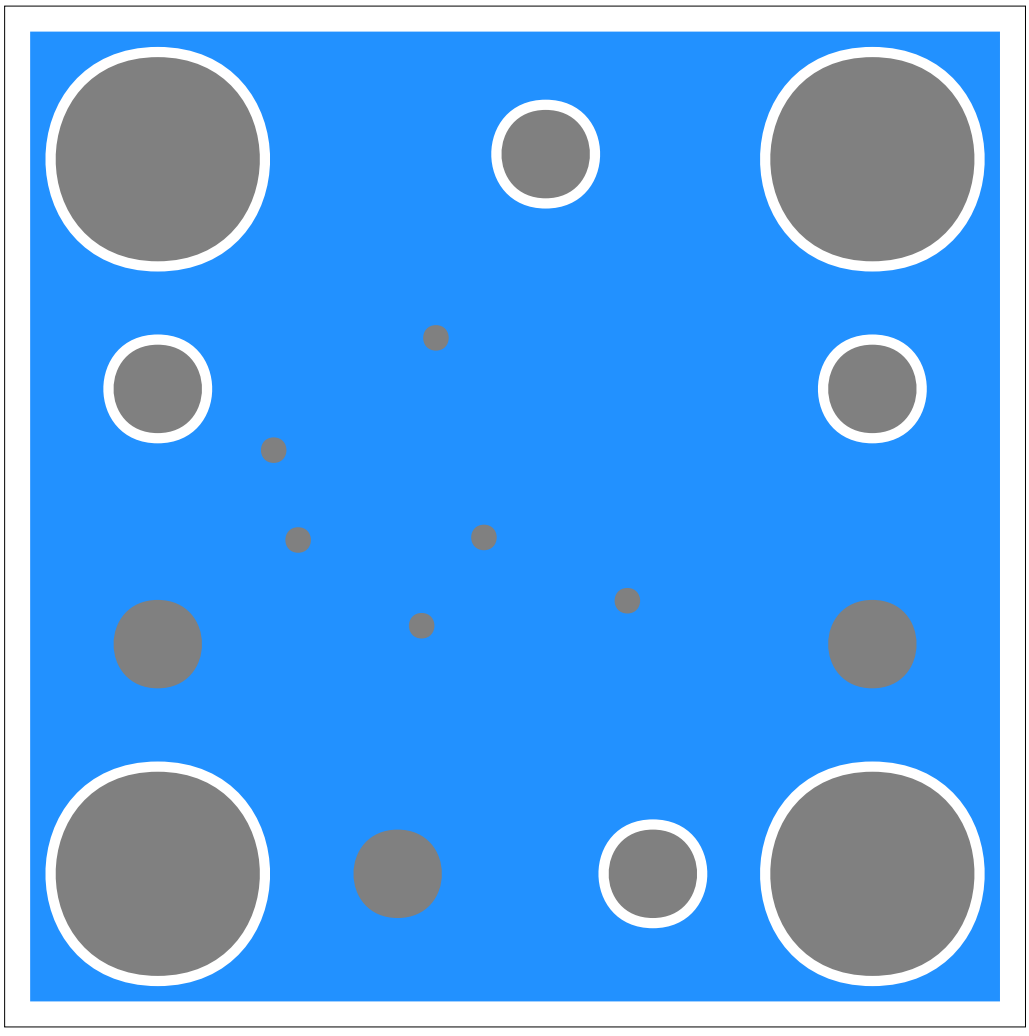
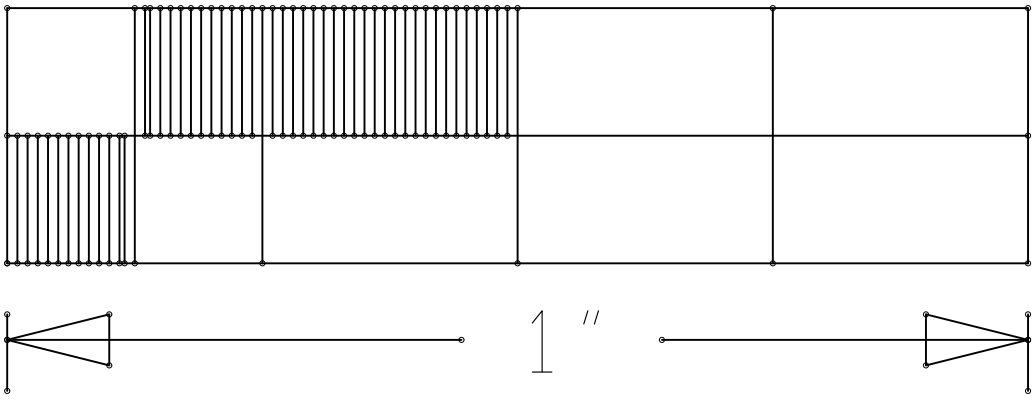
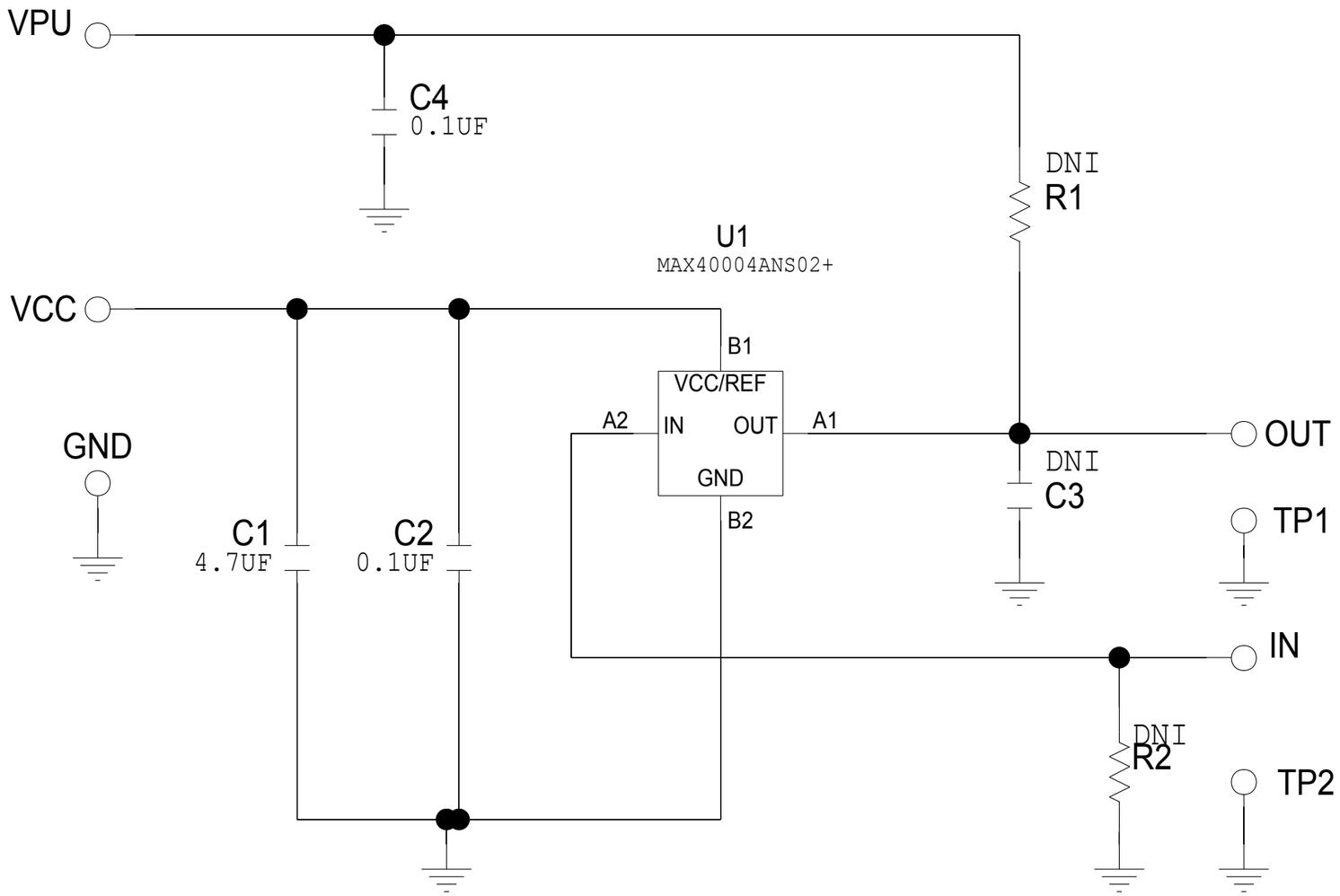




BOTTOM

BOTTOM SILKSCREEN


VPU
C4
0.1UF
DNI
R1
U1
MAX40004ANS02+
VCC
B1
VCC/REF
A2
IN
OUT
A1
OUT
GND
GND
DNI
C3
TP1
B2
C1
4.7UF
C2
0.1UF
IN
DNI
R2
TP2