

General Description

The MAX2686/MAX2688 evaluation kits (EV kits) simplify the evaluation of the MAX2686/MAX2688 GPS/GNSS low-noise amplifiers (LNAs). They enable testing of the device's RF performance and require no additional supporting circuitry. The EV kits provide 50Ω SMA connectors for inputs and outputs.

Features

- Easy Evaluation of MAX2686/MAX2688 IC
- 1.6V to 3.3V Single-Supply Operation
- RF Input and Output Matched to 50Ω
- Fully Assembled and Tested

[Ordering Information](#) appears at end of data sheet.

Quick Start

The MAX2686/MAX2688 EV kits are fully assembled and factory tested. Follow the instructions in the [Connections and Setup](#) section to test the devices.

Required Equipment

This section lists the recommended test equipment to verify the operation of the MAX2686/MAX2688. The equipment's listed are intended as suggestions and substitutions are possible:

- MAX2686/MAX2688 EV kit
- One DC power supply capable of delivering +2.85V and 50mA of current
- One RF signal generator capable of delivering RF power as high as 0dBm at 1575.42MHz (E4433B or equivalent)
- One RF spectrum analyzer that covers the MAX2686/MAX2688 operating frequency range (FSEB20 or equivalent)
- One power meter capable of measuring up to 0dBm at 1575.42MHz (Agilent E4419B or equivalent)
- Two 50Ω SMA cables
- One ammeter (optional)
- One noise figure meter (optional)
- One network analyzer (optional)

Connections and Setup

This section is a step-by-step guide to operating the EV kits and their function. **Caution: Do not turn on the DC power or RF signal generators until all connections are completed.**

Checking Power Gain

- 1) With the DC supply output disabled, connect a +2.85V power supply to the V_{CC} header and the power supply ground the GND header of the EV kit (route the positive terminal of the power supply through an ammeter, if desired).
- 2) Place a jumper between pins 2 and 3 on SHDNB (pin 1 closet to the RF_{OUT} SMA port).
- 3) With the RF signal generator output disabled, connect the generator output to the RF_{IN} SMA connector on the EV kit through an SMA cable. Set the output of the RF signal generator frequency to 1575.42MHz and power level to -25dBm.
- 4) Connect a spectrum analyzer to the RF_{OUT} SMA connector on the EV kit through an SMA cable. Set the spectrum analyzer center frequency to 1575.42MHz, reference level to 0dBm, and span to 1MHz.
- 5) Enable the DC supply output. The supply current should read approximately 4.1mA.
- 6) Enable the RF signal generator output. The spectrum analyzer should displays a tone at 1575.42MHz with power level at approximately -6dBm.

Layout Issues

A good printed-circuit board (PCB) is an essential part of RF circuit design. The EV kit PCB can serve as a guide for laying out a board using the MAX2686. Use controlled impedance lines on all high-frequency inputs and outputs. Bypass V_{CC} with decoupling capacitors located close to the device. For long V_{CC} lines, it may be necessary to add decoupling capacitors. Locate these additional capacitors farther away from the device package. This minimizes supply coupling. Proper grounding of the GND pins is essential. Connect the GND pins to the ground plane either directly, throughputs, or both.

Component Suppliers

SUPPLIER	WEBSITE
Digi-Key	www.digikey.com
Johnson/Cinch Connectivity Solutions	www.johnsoncomponents.com
Keystone	www.keyelco.com

Component Information, PCB Layout, and Schematics

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

- [MAX2686 EV BOM](#)
- [MAX2688 EV BOM](#)
- [MAX2686/MAX2688 EV PCB Layout](#)
- [MAX2686 EV Schematic](#)
- [MAX2688 EV Schematic](#)

Ordering Information

PART	TYPE
MAX2686EVKIT+	EV Kit
MAX2688EVKIT+	EV Kit

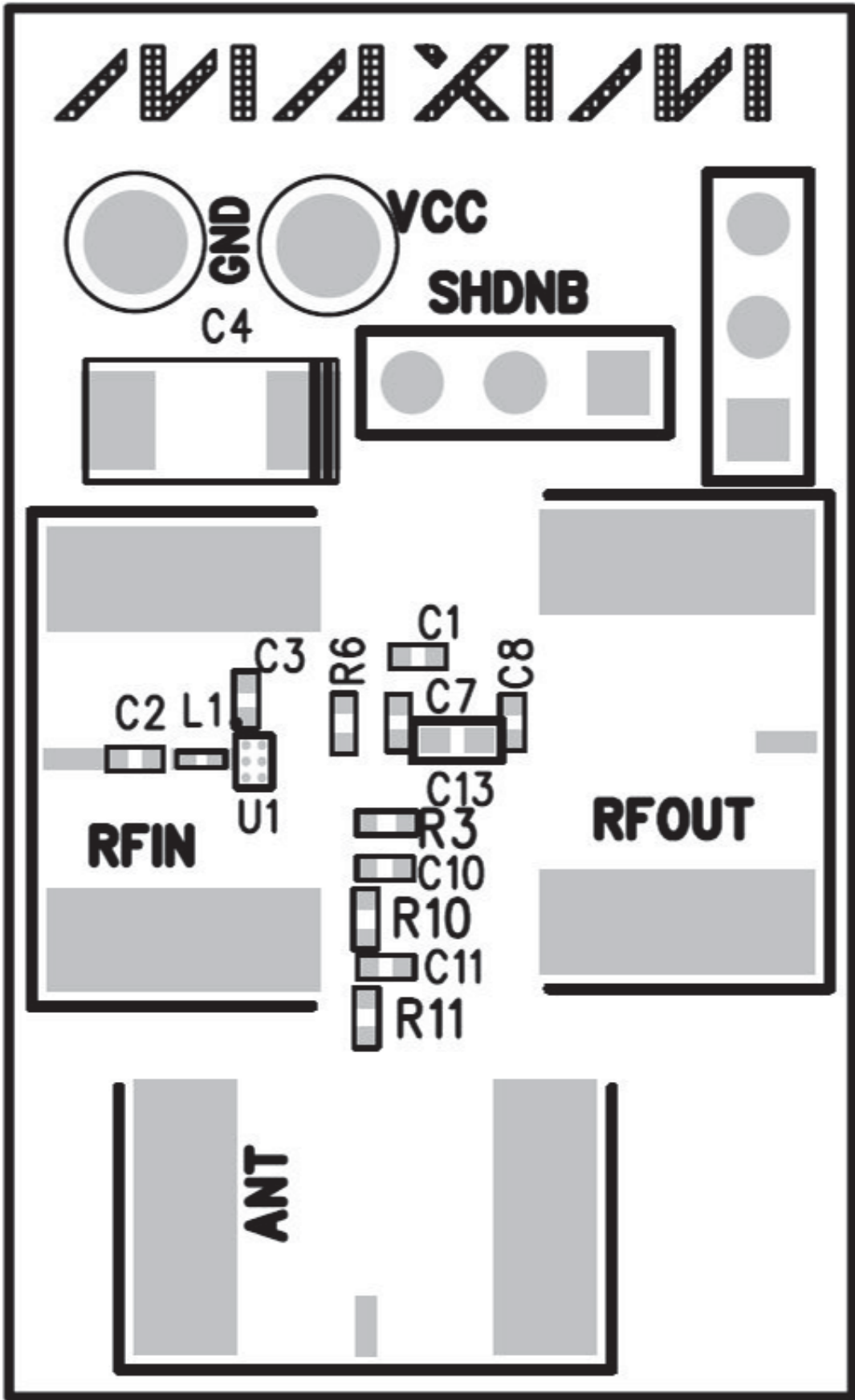
Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	3/16	Initial release	—

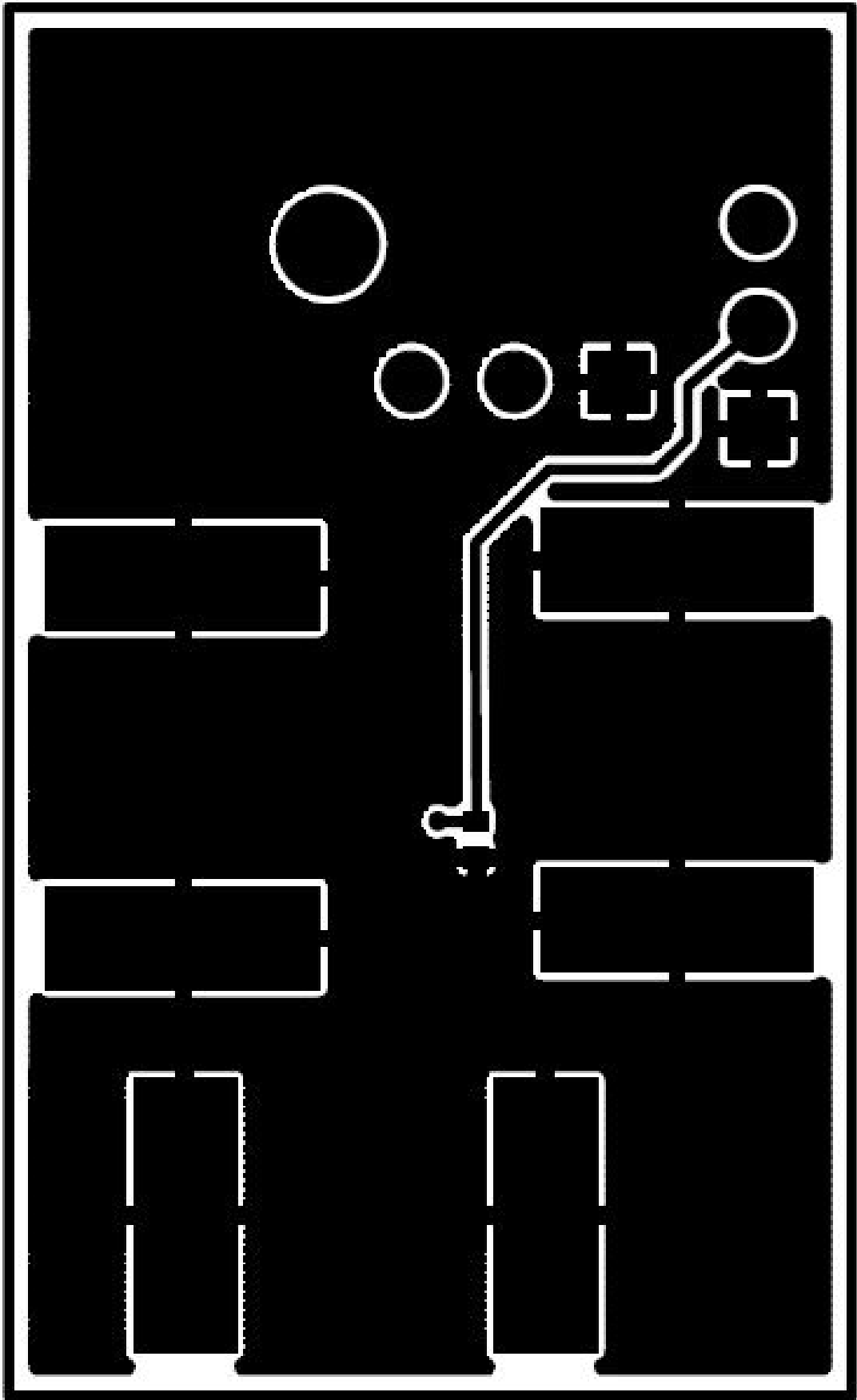
For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at www.maximintegrated.com.

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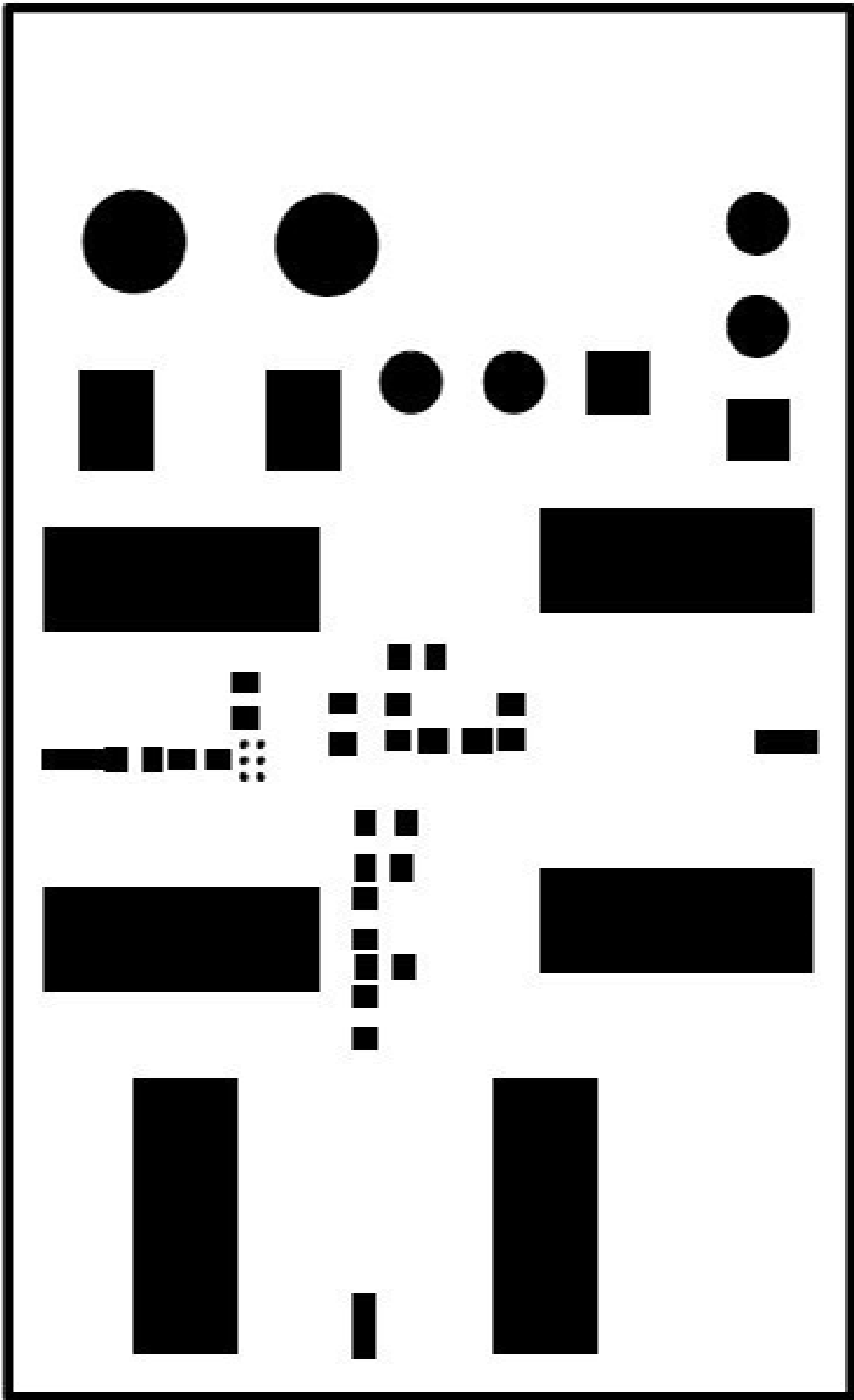
MAX2686EVKIT+, Rev A, 08 April 2010			
Reference Designators	Part Number	Description	Per
C1	GRM1555C1H390J	0402 Capacitor 39pF 5%	1
C3	GRM1555C1H100J	0402 Capacitor 10pF 5%	1
C2	GRM155R71C104K	0402 Capacitor 100nF 10%	1
C4	TAJC106K016	TANTALUM CAPACITORS, STANDARD RANGE	1
C13	GRM1555C1H101J	0402 Capacitor 100pF 5%	1
L1	LQW15AN6N8H00B	0402 Inductor 6.8nH 5%	1
R6	Use Lead-Free Parts Only	0402 Resistor 24.9k ohm 1%	1
U1	MAX2686EWS+	GPS LNA	1
RFIN RFOUT	Johnson: 142-0701-801	SMA End Launch Jack Receptacle 0.062"	2
SHDNB	Sullins: PEC36SAAN	1x3 Header, 100 mil centers	1
GND VCC	Keystone 5000	PC Mini-Red	2
		Box Small Brown 9 3/16 x 7 x 7/8	1
		ESD Bag, Static Shield Zip 4x6 w/esd logo	1
		Pink Foam anti static 12 x 12 x 5	1
		WEB instructions for Maxim Data Sheet	
		MAX2686 Evaluation Kit Circuit Board Rev 3	1
MAX2688EVKIT+, Rev 3A, 08 April 2010			
Reference Designators	Part Number	Description	Per
C1	GRM1555C1H390J	0402 Capacitor 39pF 5%	1
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C4	TAJC106K016	TANTALUM CAPACITORS, STANDARD RANGE	1
C13	GRM1555C1H101J	0402 Capacitor 100pF 5%	1
L1	LQW15AN6N2C00	0402 Inductor 6.2nH 0.2nH	1
R6	Use Lead-Free Parts Only	0402 Resistor 24.9k ohm 1%	1
U1	MAX2688EWS+	GPS LNA	1
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		WEB instructions for Maxim Data Sheet	
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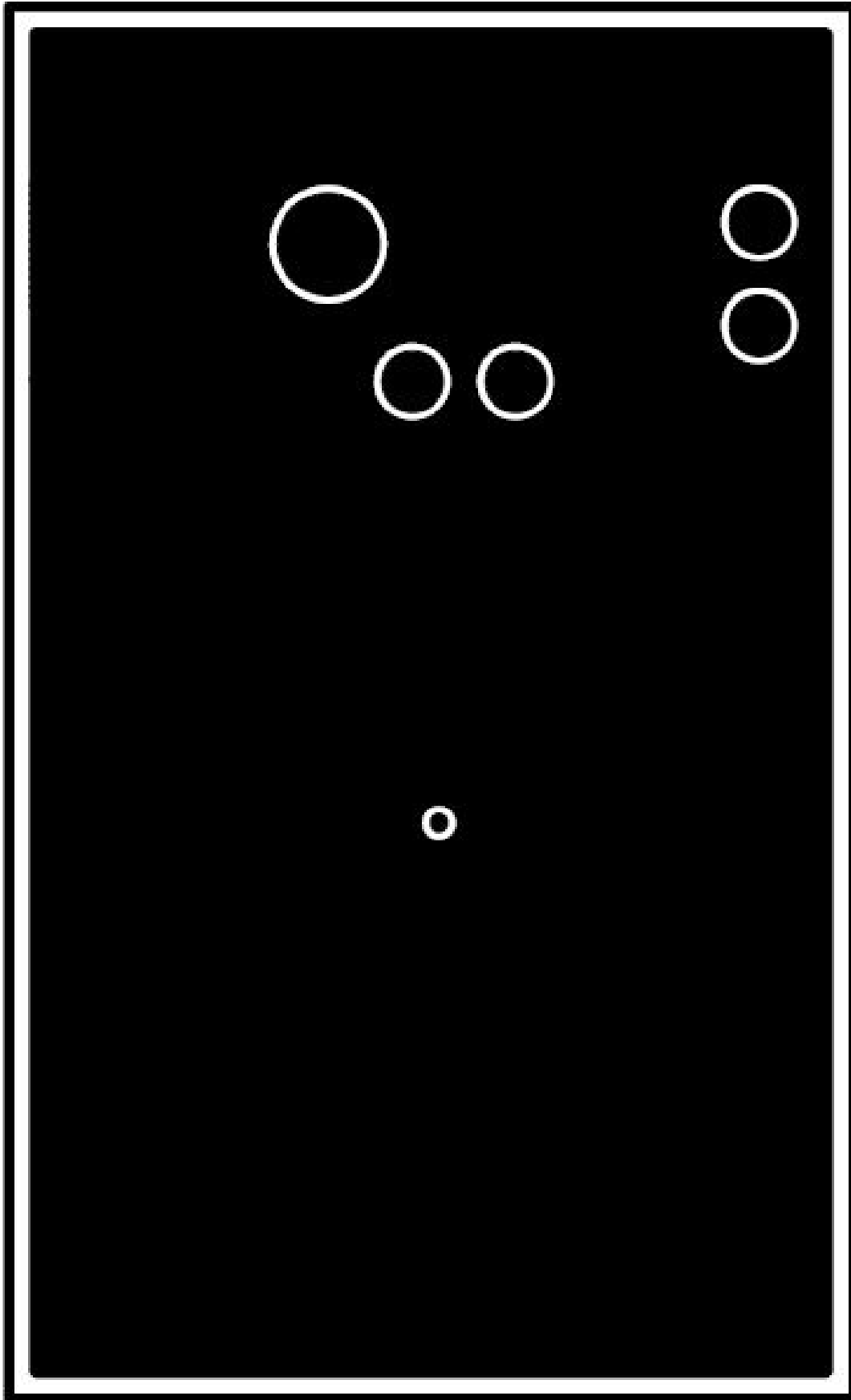
Component Replacement Guide—Component Side



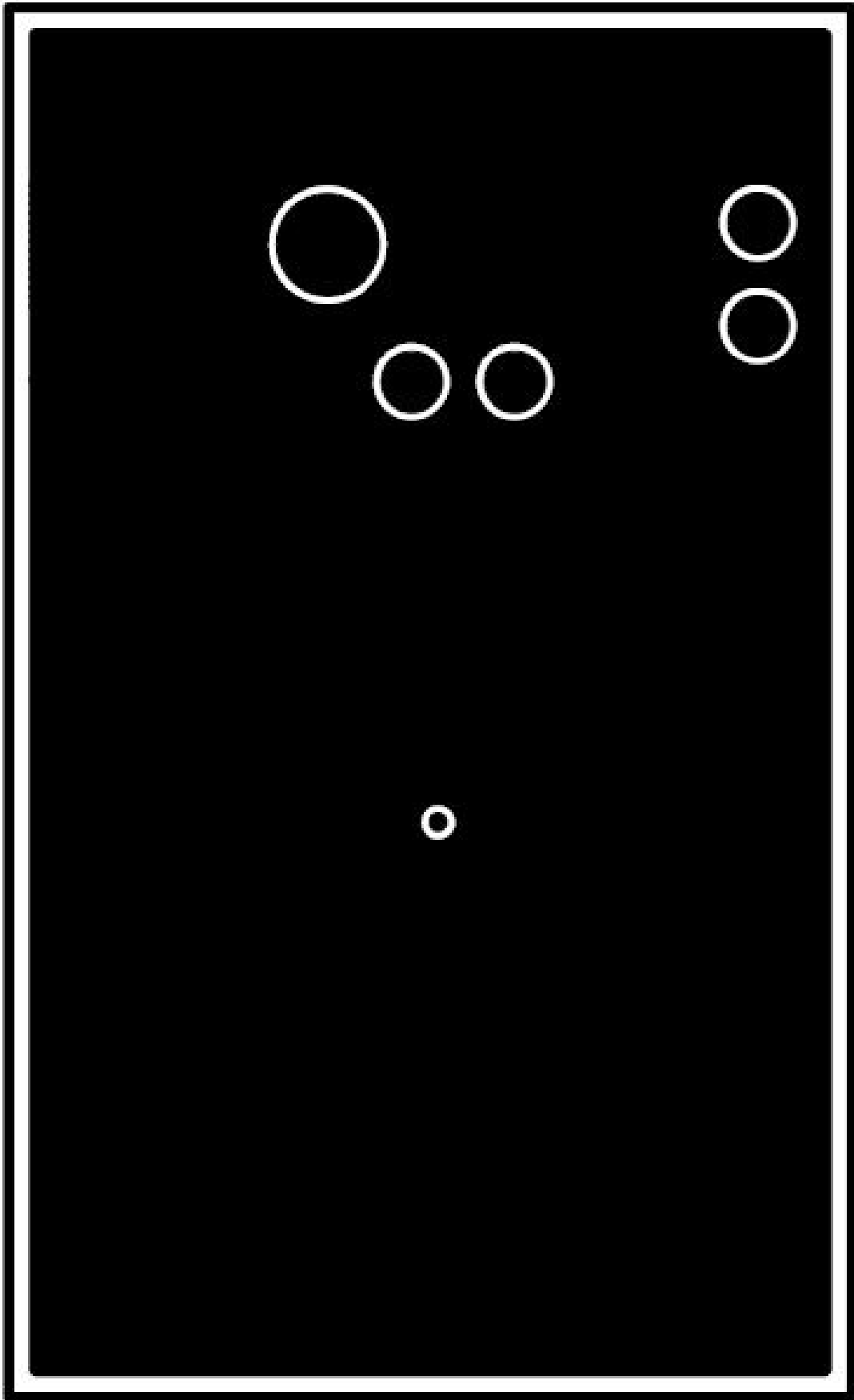
PCB Layout—Secondary Side



PCB Layout—Component Side

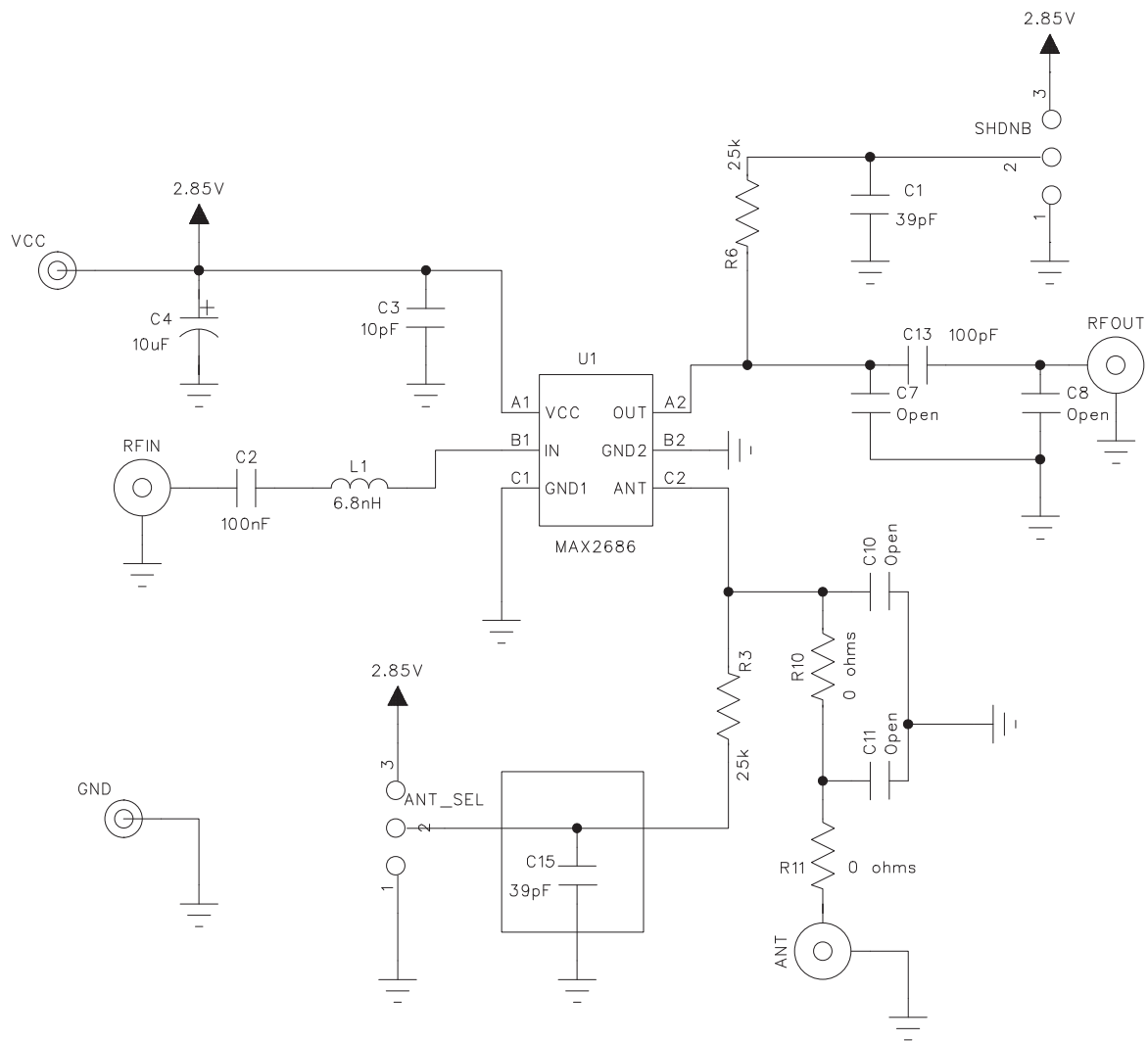


PCB Layout—Layer 3



PCB Layout—Layer 2

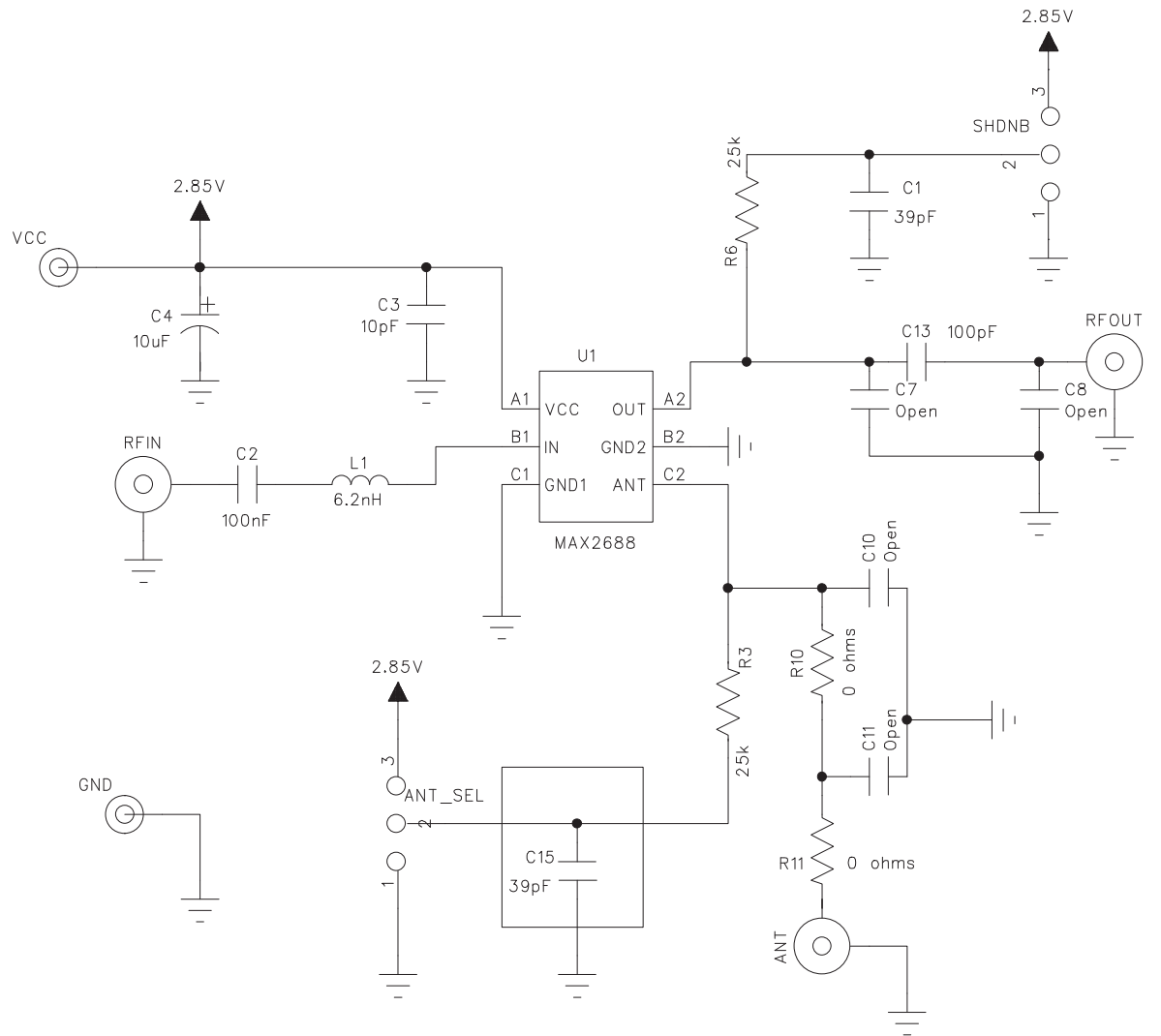
MAX2686 Schematic



Note 1: The board will also be used for WV26 (6 pins WLP)

Note 2: 2D line circles the bottom side components.

MAX2688 Schematic



Note 1: The board will also be used for WV26 (6 pins WLP)

Note 2: 2D line circles the bottom side components.