

MAX40203 WLP Evaluation Kit

Evaluates: MAX40203ANS+

General Description

The MAX40203 WLP evaluation kit provides a proven design to evaluate the MAX40203 “ideal-diode”. This EV kit demonstrates the MAX40203 in a tiny 4-bump WLP (MAX40203ANS+).

The MAX40203 WLP EV kit PCB comes with two MAX40203ANS+ devices installed. The MAX40203 device is a current-switch, which drops so little voltage as to approximate an “ideal diode”.

Features

- Drops Only 43mV at 500mA
- Less than 10nA Leakage When Reverse-Biased From V_{DD}
- Supply Voltage Range: Between 1.2V and 5.5V
- Low Supply Quiescent Current: 300nA (typ), 500nA (max)
- Thermally Self-Protecting
- -40°C to +125°C Temperature Range
- Evaluates MAX40203ANS+
- Accommodates Easy-to-Use Components
- Proven PCB Layout
- Fully Assembled and Tested

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

MAX40203 WLP EV Kit Photo



Quick Start

Required Equipment

- MAX40203 WLP EV kit
- +6V DC power supply
- Electronic load capable of sinking 1A (e.g., HP6060B)
- Precision voltmeter

Procedure

The EV kit is fully assembled and tested. Follow the below instructions to verify board operation. **Caution: Do not turn on the power supply or the electronic load until all the connections are complete.**

1. Set the DC power supply to 3.6V output. Connect the positive terminal of the 3.6V supply to the V_{DD} pad. Connect the negative terminal of the 3.6V supply to the GND pad.
2. Connect the electronic load’s positive terminal to the OUT pad and the negative terminal to the GND pad and set to 500mA sink.
3. Connect the voltmeter across the V_{DD} and OUT pads.
4. Verify all the shunts are in default positions, as shown in [Table 1](#).
5. Do not install J3.
6. Turn on the power supply.
7. Turn on the electronic load and verify that the current flowing is equal to the set value of 500mA.
8. Verify that the forward voltage or ($V_{DD} - V_{OUT}$) voltmeter reading is approximately 43mV.
9. Turn off the electronic load.
10. Set the electronic load to sink 100mA.
11. Turn on the electronic load.
12. Verify that the forward voltage or ($V_{DD} - V_{OUT}$) voltmeter reading is approximately 16mV.

Table 1. Jumper Functions (J1 – J3)

JUMPER LABEL	SHUNT POSITION	DESCRIPTION
J1	1-2*	Enables U1
	2-3	Disables U1
J2	1-2*	Enables U2
	2-3	Disables U2
J3**	Not Installed*	Devices U1 and U2 Enable operates independently
	Installed	Connects Enable (EN) input of U1 and U2 together. User-supplied enable input signal
J4	Not Installed*	Devices operate independently
	Installed	Connect OUT(U1) and OUT(U2) together for ORing application

*Default position.

**When installing J3, remove J1 and J2 from the EV kit.

Detailed Description of Hardware

The MAX40203 WLP kit provides a proven design to evaluate the MAX40203 tiny 4-bump WLP “ideal-diode.” The device blocks reverse voltages and passes current when forward-biased, just as a normal diode would. The device, when forward-biased and enabled, conducts with as little as 43mV of voltage drop while carrying currents as high as 500mA. At higher currents (up to 1A), the voltage drop increases linearly. The MAX40203 WLP protects itself, and any down-stream circuitry, from overtemperature conditions.

When disabled (EN = low), the MAX40203 WLP can block voltages up to 6V in either direction, making it suitable for most low-voltage portable electronic devices. The low (300nA, typ.) supply current is independent of the load current. The MAX40203 WLP operates from supplies within the range of 1.2V and 5.5V.

Theory of Operation

The two “ideal-diode” devices may be used independently or together. The PCB circuit mimics a typical wall adaptor/ battery-charging circuit having different V_{DD1} and V_{DD2}. They are connected to the common output, where the load is connected.

When used independently or together, enable inputs EN1 and EN2 turn the device on or off. The device that is turned on conducts current to the load. The device that is turned off does not conduct current to the load from its V_{DD} input.

Ordering Information

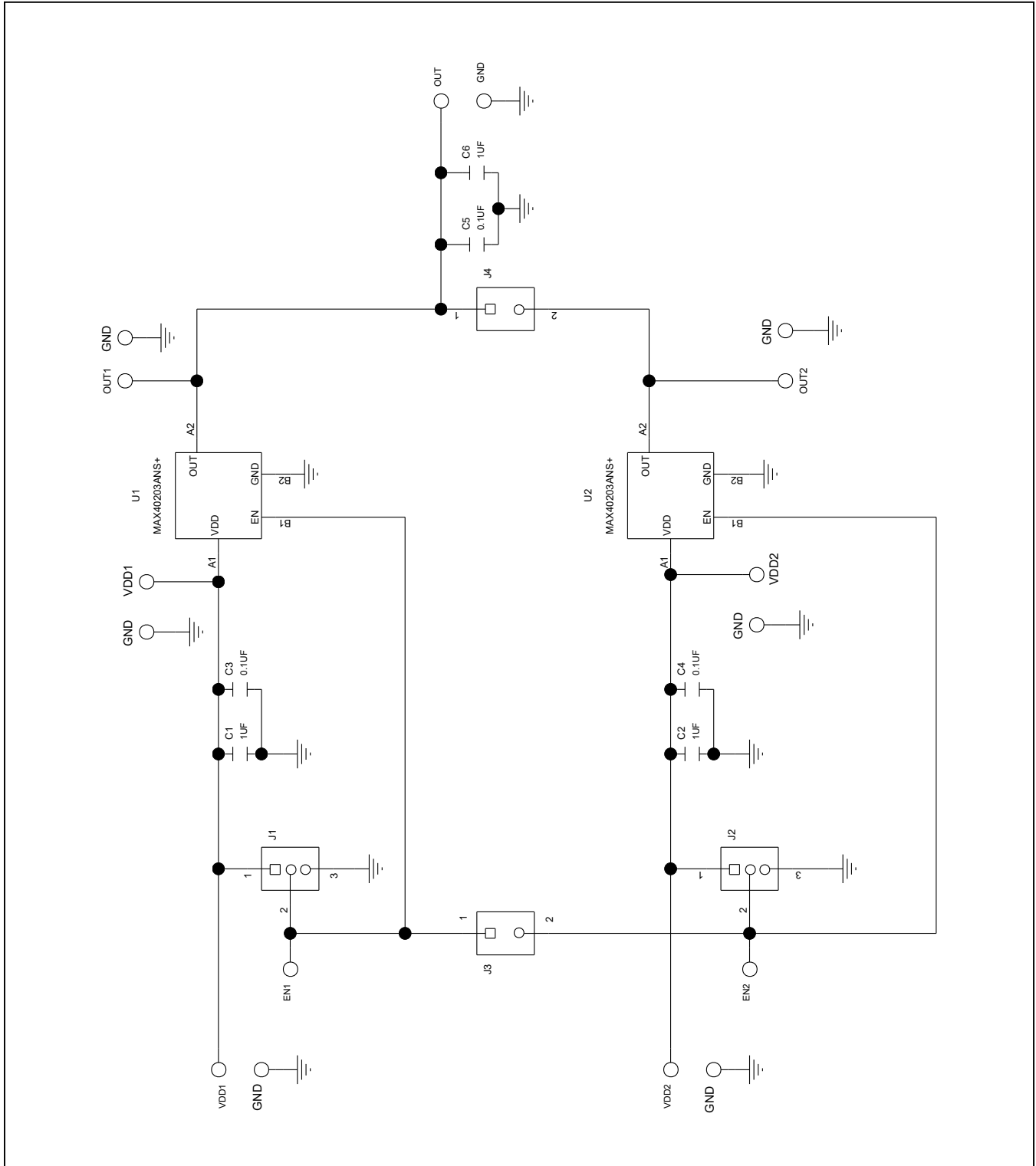
PART	TYPE
MAX40203-W-EVKIT#	EV Kit

#Denotes RoHS compliant.

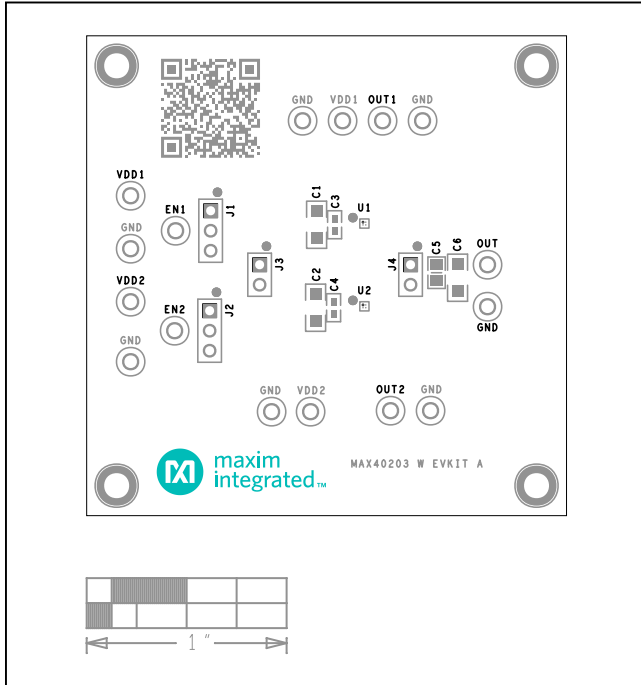
MAX40203 WLP EV Kit Bill of Materials

ITEM	REF DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	C1, C2, C6	-	3	C1206C105K3RAC;ECI-3YB1E105K	KEMET;PANASONIC	1UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 1UF; 25V;TOL=10%; MODEL=X7R; TG=-55 DEGC TO +125 DEGC; TC=+/-	
2	C3, 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	C5	-	1	C2012X7T2E104K125AA	TDK	0.1UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 0.1UF; 250V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7T	
4	EN1, EN2, OUT, OUT1, OUT2, TP5, TP6, VDD1, VDD2	-	9	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	GND, TP1-TP4, TP9, TP10	-	7	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;	
6	J1, J2	-	2	PBC03SAAN	SULLINS	PBC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; -65 DEGC TO +125 DEGC	
7	J3, J4	-	2	PBC02SAAN	SULLINS ELECTRONICS CORP.	PBC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS	
8	U1, U2	-	2	MAX40203ANS+	MAXIM	MAX40203ANS+	EVKIT PART - IC; ULTRA-TINY NANOPOWER; 1A IDEAL DIODE WITH ULTRA-LOW VOLTAGE DROP; PACKAGE OUTLINE DRAWING NUMBER: 21-100273; PACKAGE CODE: N40F0+1; WLP4	
9	PCB	-	1	MAX40203W	MAXIM	PCB	PCB:MAX40203W	-
TOTAL			29					

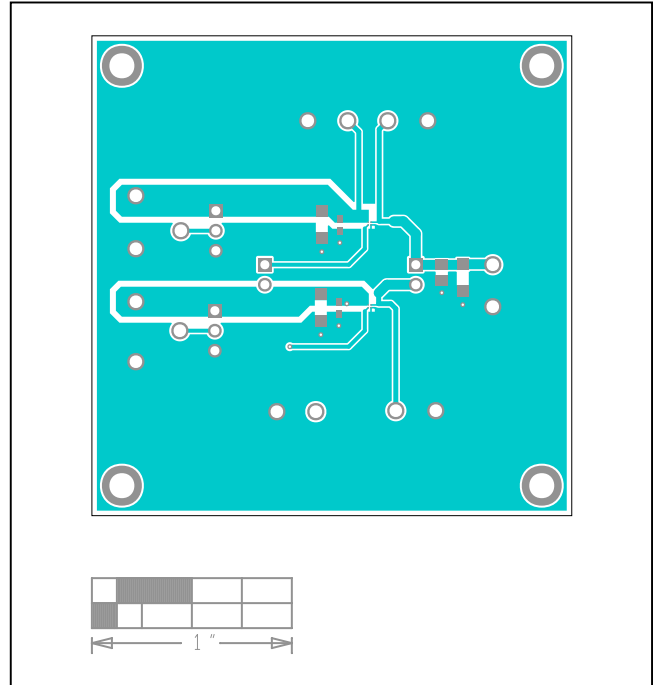
MAX40203 WLP EV Kit Schematic



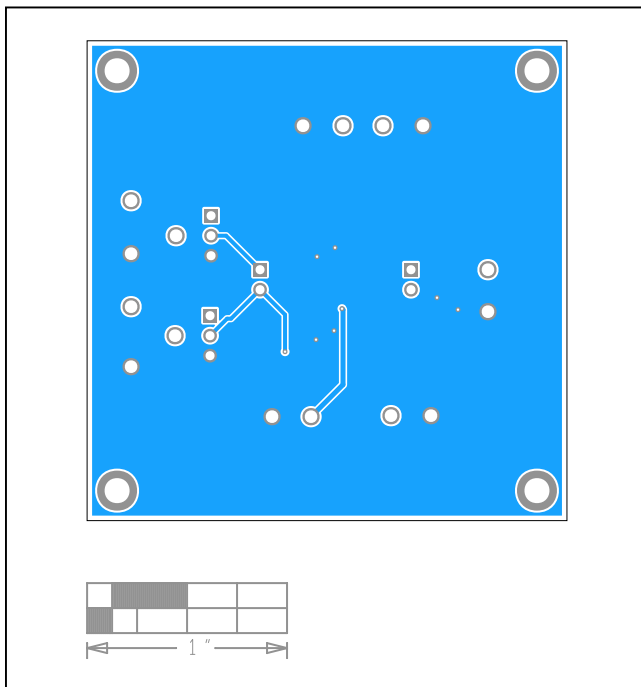
MAX40203 WLP EV Kit PCB Layout Diagrams



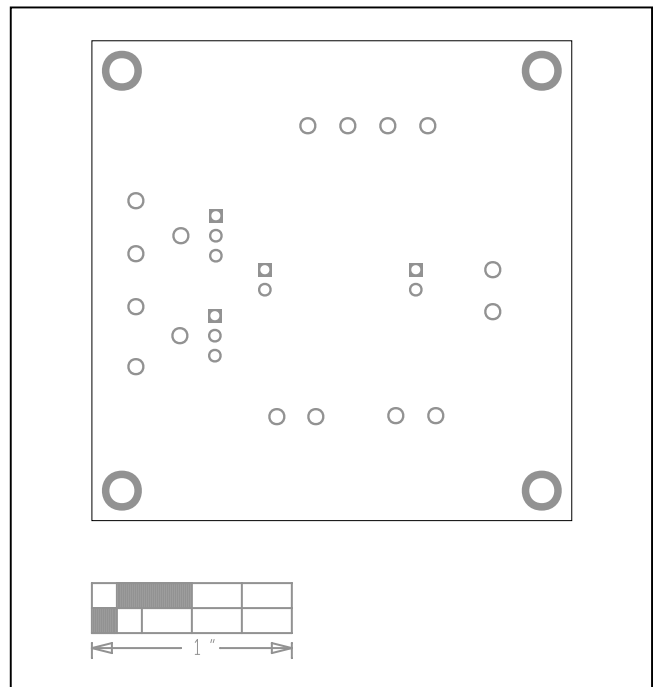
MAX40203 WLP EV Kit—Silk_Top



MAX40203 WLP EV Kit—Top



MAX40203 WLP EV Kit—Bottom



MAX40203 WLP EV Kit—Silk_Bot

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	4/19	Initial release	—

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