

General Description

The MAX40203 evaluation kit (EV kit) provides a proven design to evaluate the MAX40203 “ideal-diode”. This EV kit demonstrates the MAX40203 in a space-saving 5-pin SOT23 (MAX40203AUK+). This EV kit can be used to evaluate the MAX40203AUK+ as well.

The MAX40203 EV kit PCB comes with two MAX40203AUK+ devices installed. The MAX40203 device is a current-switch, which drops so little voltage as to approximate an “ideal diode”.

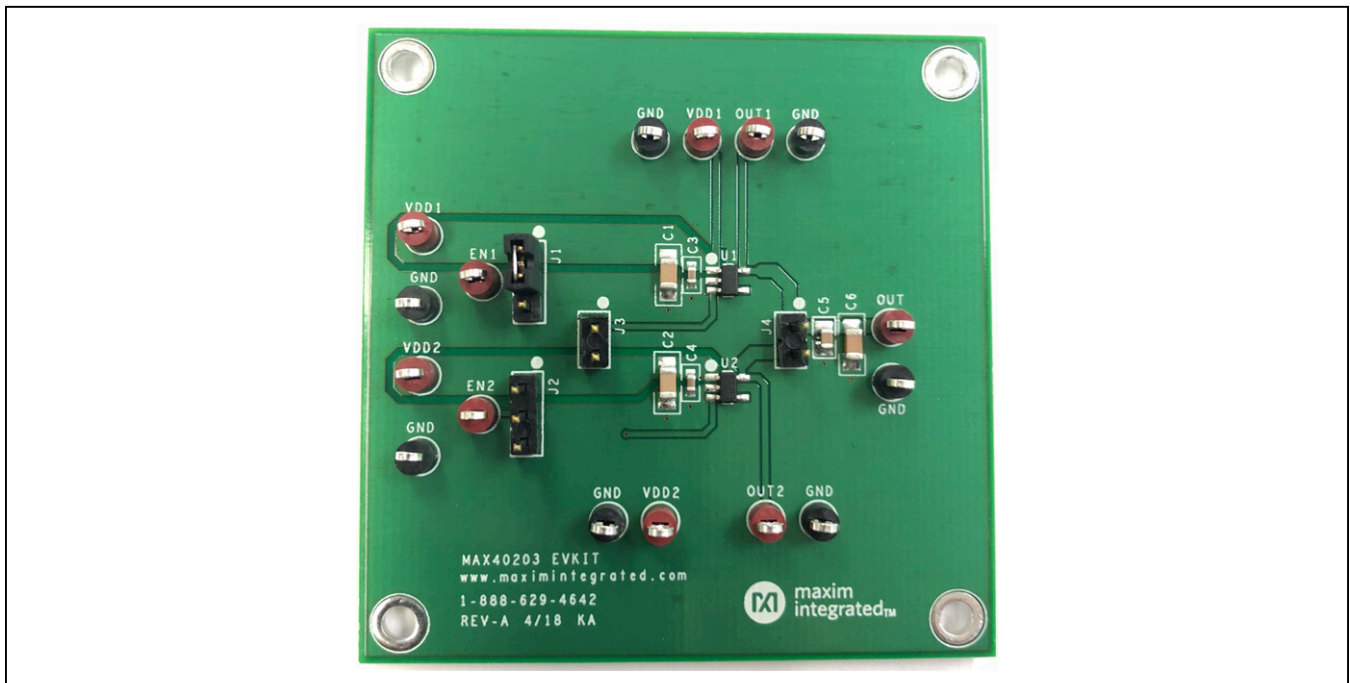
The MAX40203 is also available in a tiny 0.8mm x 0.8mm 4-bump WLP with a 0.35mm bump pitch and has lower voltage drop. These devices operate over the automotive -40°C to +125°C temperature range.

Features

- Drops Only 100mV 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 MAX40203AUK+
- Accommodates Easy-to-Use Components
- Proven PCB Layout
- Fully Assembled and Tested

Ordering Information appears at end of data sheet.

MAX40203 EV Kit Photo



Quick Start

Required Equipment

- MAX40203 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 100mV.
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 28mV.

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 EV kit provides a proven design to evaluate the MAX40203 5-pin SOT23, space-saving, “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 100mV of voltage drop while carrying currents as high as 500mA. At higher currents (up to 1A), the voltage drop increases linearly. The MAX40203 protects itself, and any down-stream circuitry, from overtemperature conditions.

When disabled (EN = low), the MAX40203 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 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
MAX40203EVKIT#	EV Kit

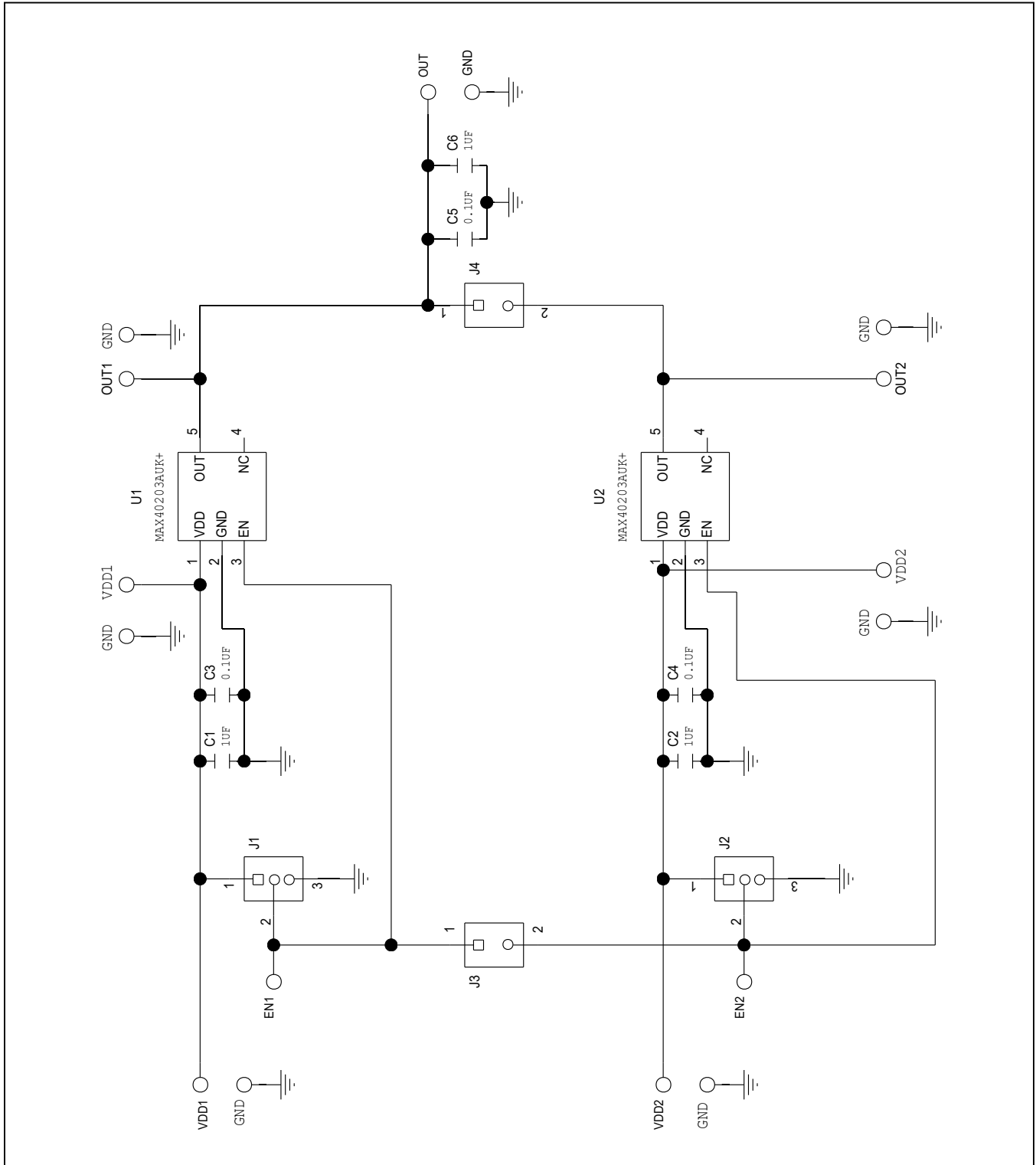
#Denotes RoHS compliant.

MAX40203 EV Kit Bill of Materials

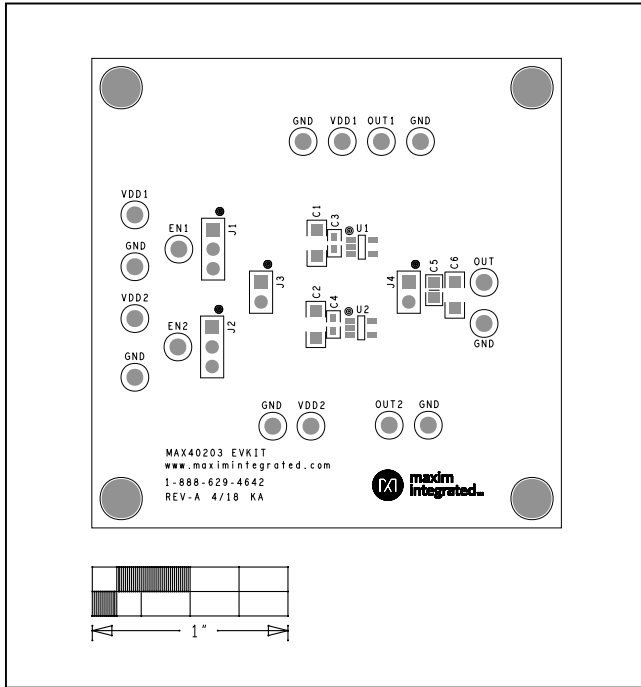
ITEM	REF_DES	DNI/ DNP	QTY	MFG PART #	MFG	VALUE	DESCRIPTION
1	C1, C2, C6	-	3	C1206C105K3RAC;ECJ-3YB1E105K	KEMET;PANA SONIC	1UF	CAPACITOR; SMT (1206); CERAMIC CHIP; 1UF; 25V; TOL=10%; MODEL=X7R; TG=-55 DEGC TO +125 DEGC; TC=+/-
2	C3, C4	-	2	C1608X7R1E104K080AA	TDK	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 25V; TOL=10%; MODEL=C SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R
3	C5	-	1	C2012X7T2E104K125	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 ELECTRONIC S CORP.	PBC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS
8	U1, U2	-	2	MAX40203AUK+	MAXIM	MAX40203AUK+	EVKIT PART - IC; ULTRA-TINY NANOPOWER; 1A IDEAL DIODE WITH ULTRA-LOW VOLTAGE DROP; PACKAGE OUTLINE DRAWING NUMBER: 21-0057; PACKAGE LAND PATTERN: 90-0174; PACKAGE CODE: U5+2; SOT23-5
9	PCB	-	1	MAX40203	MAXIM	PCB	PCB:MAX40203
TOTAL			29				

NOTE: DNI--> DO NOT INSTALL(PACKOUT) ; DNP--> DO NOT PROCURE

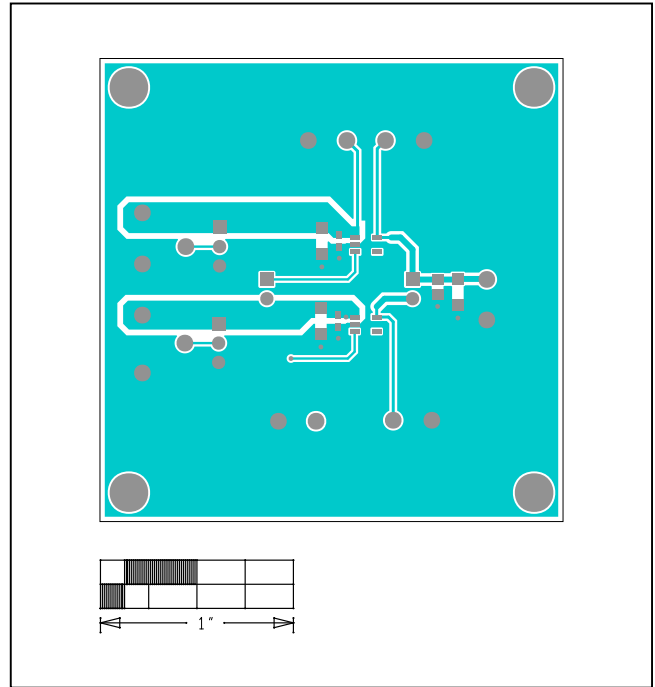
MAX40203 EV Kit Schematic



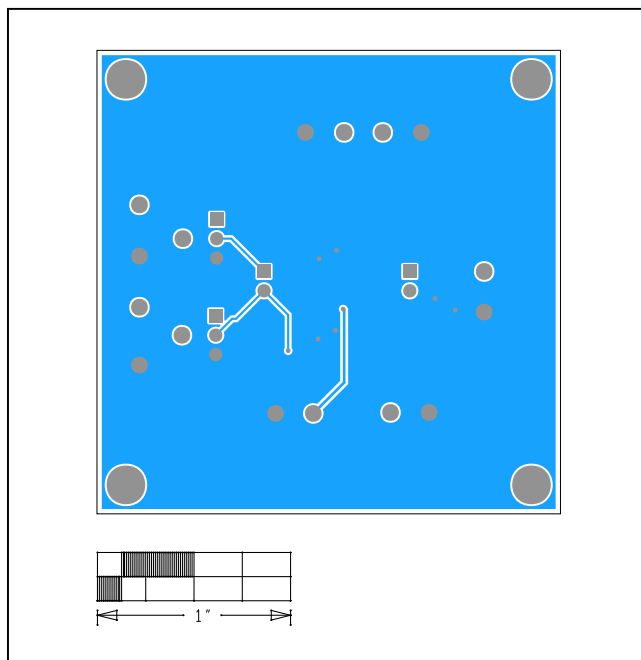
MAX40203 EV Kit PCB Layout Diagrams



MAX40203 EV Kit—Top Silkscreen



MAX40203 EV Kit—Top



MAX40203 EV Kit—Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	7/18	Initial release	—

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