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 VDD
- 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.
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 VDD 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)

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

*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 VDD1 and VDD2. 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 off does not conduct current to the load. The device that is turned on conducts current to the load.

Ordering Information

#Denotes RoHS compliant.

MAX40203 EV Kit Bill of Materials

<table>
<thead>
<tr>
<th>ITEM</th>
<th>REFDES</th>
<th>QTY</th>
<th>MFG PART #</th>
<th>MFG</th>
<th>VALUE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 C1, C2, C6</td>
<td>-3 C1206C105K3RAC;ECJ;3YB1E105</td>
<td>KEMET;PANASONIC</td>
<td>1UF</td>
<td>CAPACITOR; SMT (1206); CERAMIC CHIP; 1UF; 25V; TOL=10%; MODEL=X7R; TG=-55 DEG C TO +125 DEG C; TC=+/-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 C3, C4</td>
<td>-2 C1608X7R1E104K080AA TDK</td>
<td>0.1UF</td>
<td>CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 25V; TOL=10%; MODEL=C SERIES; TG=-55 DEG C TO +125 DEG C; TC=X7R</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 C5</td>
<td>-1 C2012X7T2E104K125 TDK</td>
<td>0.1UF</td>
<td>CAPACITOR; SMT (0805); CERAMIC CHIP; 0.1UF; 250V; TOL=10%; MODEL=C SERIES; TG=-55 DEG C TO +125 DEG C; TC=X7T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 EN1, EN2, OUT, OUT1, OUT2, TP5, TP6, VDD1, VDD2</td>
<td>-9 5005 KEYSSTONE N/A</td>
<td>N/A</td>
<td>TEST POINT; PIN Dia=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5 GND, TP1-TP4, TP9, TP10</td>
<td>-7 5005 KEYSSTONE N/A</td>
<td>N/A</td>
<td>TEST POINT; PIN Dia=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 J1, J2</td>
<td>-2 PBC03SAAN SULLINS</td>
<td>PBC03SAAN</td>
<td>CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; -65 DEG C TO +125 DEG C</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7 J3, J4</td>
<td>-2 PBC03SAAN SULLINS ELECTRONIC CORP.</td>
<td>PBC03SAAN</td>
<td>CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS</td>
<td></td>
<td></td>
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<tr>
<td>8 U1, U2</td>
<td>-2 MAX40203AU+ MAXIM</td>
<td>MAX40203AU+</td>
<td>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: UP=2, SOT23-5</td>
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<td></td>
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<tr>
<td>9 PCB</td>
<td>-1 MAX40203 MAXIM</td>
<td>PCB</td>
<td>PCB:MAX40203</td>
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TOTAL 29

NOTE: DNI--> DO NOT INSTALL(PACKOUT); DNP--> DO NOT PROCURE
MAX40203 EV Kit Schematic
MAX40203 Evaluation Kit

Evaluates: MAX40203

MAX40203 EV Kit PCB Layout Diagrams

MAX40203 EV Kit—Top Silkscreen

MAX40203 EV Kit—Top

MAX40203 EV Kit—Bottom

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Revision History

<table>
<thead>
<tr>
<th>REVISION NUMBER</th>
<th>REVISION DATE</th>
<th>DESCRIPTION</th>
<th>PAGES CHANGED</th>
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<tr>
<td>0</td>
<td>7/18</td>
<td>Initial release</td>
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