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APPLICATION NOTE 4634

# Adding Edge-Sensitive Transition Detection to GPIO Devices

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*Abstract: Although many GPIO devices can detect the rising and falling edge of a signal-level change, some applications only need to capture the leading edge and not monitor the falling edge. These GPIO devices can be enhanced to detect edge-sensitive signal transitions. A simple circuit provides the transition detection.*

Several Maxim GPIO devices can detect signal-level changes and keep a record for the corresponding ports even if the signal has returned to its original level. For these devices either the rising or falling edge of a signal change can trigger the capture of the event. With some applications only the leading edge indicates a monitored event; the falling edge corresponds to the resolution of the event and should not draw the attention of the monitor. For these applications, detection of an edge-sensitive transition is needed.

The Maxim devices that detect signal transitions can be given edge sensitivity by using a few RC components and a Schmitt trigger device as shown in **Figure 1**. The RC circuit captures the first transition in the normal logic signal-level range and puts the following transition either above or below the range. The Schmitt trigger circuit subsequently filters out the event corresponding to the second transition. Although there are also two transitions at the output of the Schmitt trigger, the Maxim parts do not distinguish the changes since the duration is much shorter than an I<sup>2</sup>C-read command.

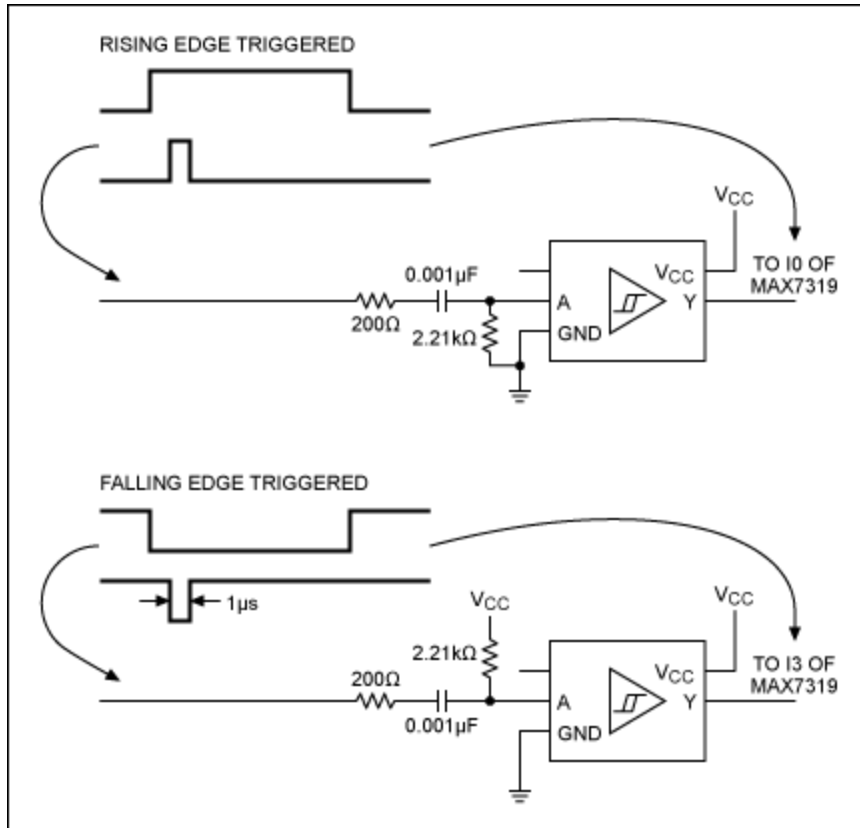


Figure 1. Circuit for edge-sensitive transition detection.

Several Maxim devices feature the transition detection feature and can be used with the circuit in Figure 1: [MAX7302](#), [MAX7306/MAX7307](#), [MAX7319](#), [MAX7321](#), [MAX7322](#), and [MAX7323](#). The Schmitt trigger devices that can be used in the circuit of Figure 1 are the single-buffer SN74LVC1G17 and dual-buffer SN74LVC2G17.

Related Parts		
<a href="#">MAX7302</a>	SMBus/I <sup>2</sup> C Interfaced 9-Port, Level-Translating GPIO and LED Driver with CLA	<a href="#">Free Samples</a>
<a href="#">MAX7306</a>	SMBus/I <sup>2</sup> C Interfaced 4-Port, Level-Translating GPIOs and LED Drivers	<a href="#">Free Samples</a>
<a href="#">MAX7307</a>	SMBus/I <sup>2</sup> C Interfaced 4-Port, Level-Translating GPIOs and LED Drivers	<a href="#">Free Samples</a>
<a href="#">MAX7319</a>	I <sup>2</sup> C Port Expander with Eight Inputs and Maskable Transition Detection	<a href="#">Free Samples</a>
<a href="#">MAX7321</a>	I <sup>2</sup> C Port Expander with 8 Open-Drain I/Os	<a href="#">Free Samples</a>
<a href="#">MAX7322</a>	I <sup>2</sup> C Port Expander with 4 Push-Pull Outputs and 4 Inputs	<a href="#">Free Samples</a>
<a href="#">MAX7323</a>	I <sup>2</sup> C Port Expander with 4 Push-Pull Outputs and 4 Open-	<a href="#">Free Samples</a>

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