

## ISL7x840SEH, ISL7x841SEH, ISL71830SEH, ISL71831SEH

Digital Pin Voltage Range for the Next Generation Muxes

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## Abstract

This technical brief addresses the absolute maximum digital pin voltage range for the ISL7x840SEH, ISL7x841SEH, ISL71830SEH, and ISL71831SEH.

## Related Literature

For a full list of related documents, visit our website:

- [ISL71840SEH](#), [ISL71841SEH](#), [ISL73840SEH](#), [ISL73841SEH](#), [ISL71830SEH](#), and [ISL71831SEH](#) product pages

## 1. ISL7x840SEH and ISL7x841SEH

The Standard Microcircuit Drawing (SMD) for the ISL7x840SEH and the ISL7x841SEH lists the absolute maximum voltage range for the digital pins as the following:

- Digital Input Overvoltage Range: V+ to GND

However, this range does not leave any margin on the low end for switching transients commonly found on digital lines. The absolute minimum voltage allowable on the digital pins is gated by the turn-on voltage of the ESD diode on the pin, which happens to be 0.3V below ground. Switching transients that stay within -0.3V to V+ with respect to ground on the digital pins does not affect the device's reliability in any way.

While this minimum range is smaller in comparison to the legacy HS-1840 mux, a change in the ESD structure resulted in an HBM rating improvement for the new muxes from 225V to 8kV.

## 2. ISL71830SEH and ISL71831SEH

The Standard Microcircuit Drawing (SMD) for the ISL71830SEH and the ISL71831SEH lists the absolute maximum voltage range for the digital pins as the following:

- Digital Input Overvoltage Range:  $V_{REF}$  to (GND - 0.4V)

The digital inputs in the ISL71830SEH and the ISL71831SEH feed into a standard CMOS input where the top rail is the  $V_{REF}$  power supply. In order to allow room for switching transients on the top end, the absolute maximum voltage for the digital pin is ( $V_{REF} + 0.4V$ ) as long as ( $V_{REF} + 0.4V$ ) is less than 7V. The ESD on the digital pin triggers at or above 7V. Staying within (GND - 0.4V) to ( $V_{REF} + 0.4V$ ) < 7V ensures there are no implications for long term reliability.

### 3. Revision History

Rev.	Date	Description
0.00	Sep 19, 2018	Initial release

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