INTL3416 Product Brief

1. Description

The INTL3416 is a 2-bit bidirectional MIPI I3C v1.1.1, I2C, SMBus and SPI voltage-level translator. It has an output enable (OE) input and rising and falling edge accelerators. Its operational voltage range is 0.72 V to 1.98 V on both the A-side and B-side. However, VCCA must be less than VCCB for proper operation. With this limitation, the device is able to interface between lower and higher logic signal levels at any of the typical 1-V, 1.2-V and 1.8-V supply rails.

The OE input pin, which is referenced to VCCA, can be tied directly to VCCA. It is also 1.98-V tolerant. The OE pin can also be controlled and set to a logic low so that all the Ax (A1, A2) and Bx (B1, B2) pins can be placed in a high-impedance state. This allows for significant reduction in the quiescent current consumption.

The INTL3416 is compatible with 12.5MHz I3C speeds. However, it also supports higher speed SPI applications with two devices. It enables bidirectional voltage level translation for traditional I2C-bus/SMBus applications under normal I2C and SMBus configurations.

The INTL3416 is built in with internal10-k Ω pull-up resistors on Ax and Bx, which act as high-keepers and are enabled based on respective VCC voltage when the bus is high.

2. Features

- 2-bit dual supply bidirectional translator for I3C, I2C, SMBus, SPI applications
- Bidirectional voltage translation with no direction pin
- High-impedance output Ax and Bx pins when OE = 0 V or VCC = 0 V
- Internal 10-kΩ pull-up resistors on Ax and Bx pins
- 0.72 V to 1.98 V on both ports A and B; VCCA ≤ VCCB
- Compatible with MIPI I3C, supporting speeds up to 12.5 MHz
- VCC isolation feature: If either VCC input is at GND, both ports A and B are in the high-impedance state
- No power-supply sequencing required: Either VCCA or VCCB can be ramped first
- Low Ioff of 2.5 μA when either VCCA or VCCB = 0 V
- OE input to be tied directly to VCCA or controlled by GPIO
- Latch-up performance higher than 150 mA per JESD 78, class II
- ESD protection exceeds
  - 8000-V human-body model (JS-001-2017)
  - 2000-V charged-device model (JS-002-2022)

3. Applications

- Servers
- Wearables
- Personal electronics

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4. Functional Diagram

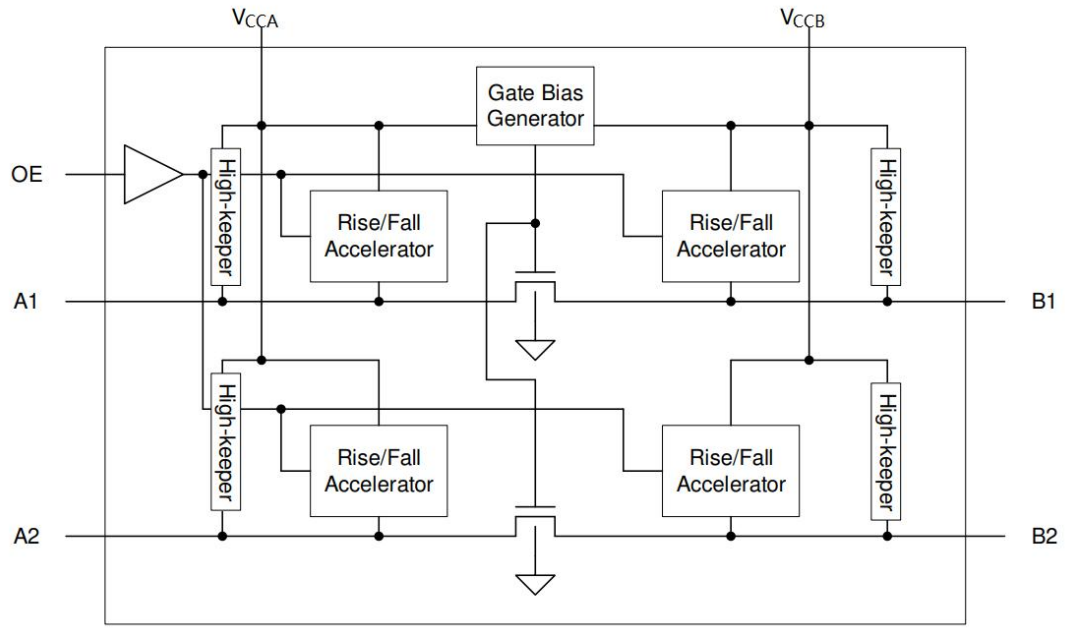

Figure 1 Functional Diagra