Application Clip
Standard Linear and Logic

AVCA (B) 164245 Translation Devices For LCD Module and Compact Flash Interfaces

Technology Trend

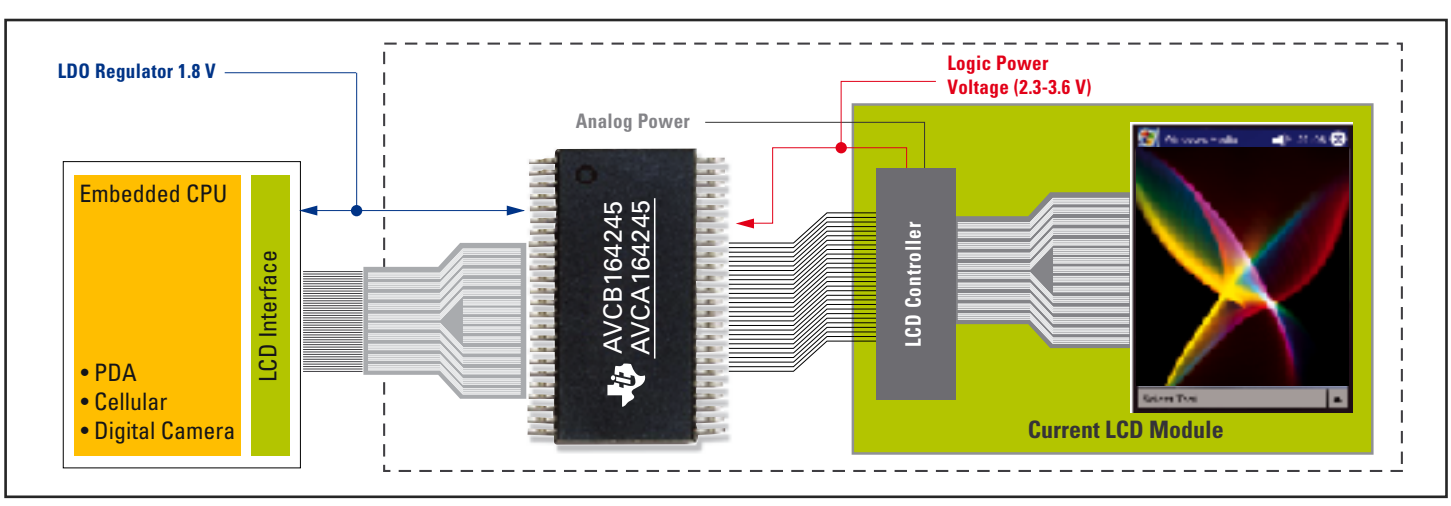
- LCD displays on mobile phones, digital cameras and PDA's are moving to higher-resolution color displays.
- CPU and microcontroller I/O voltages are decreasing and moving to 2.5-V and below as core operating voltages migrate to 1.8-V and lower.
- The existing controllers for LCD panels in the market still operate from 3 to 3.6-V supply voltages. Similarly, the LCD module interface in the market also remains fixed at the 3.3-V logic level.

Existing Problem

The I/O voltage mismatch between the processor and the LCD module makes it extremely difficult for these devices to interface and maintain acceptable noise margins.

Proposed Solution

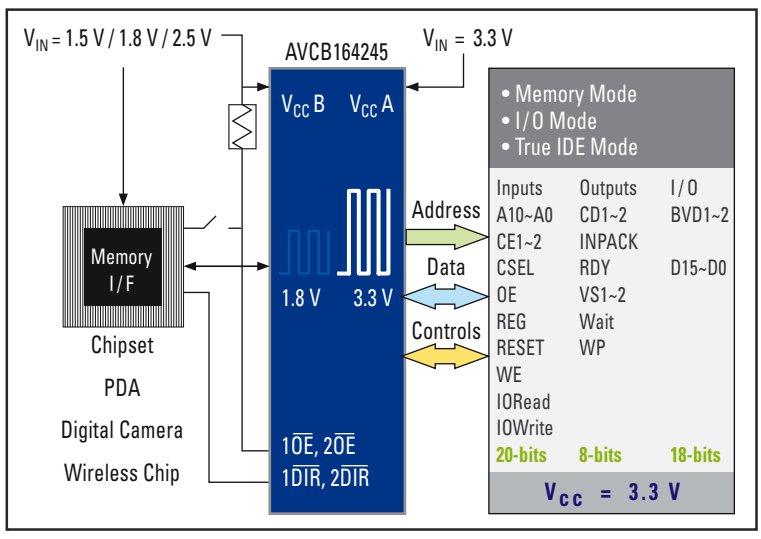
The SN74AVCA164245 (or SN74AVCB164245) is a level-shifting logic buffer capable of translating from levels as low as 1.4-V up to a maximum of 3.6-V. It is ideally suited for interfacing with the lower-voltage microprocessor to the 3.3-V LCD module. Below is a block diagram showing the integration of the translation logic device onto the LCD module.



Compact Flash I/O Buffer

The compact flash (CF/CF+) standard provides interface to the CompactFlash (CF) flash data storage cards, magnetic disk cards and I/O cards including, but not limited to, serial cards, Ethernet cards, fax/modem cards, and wireless pager cards. A CompactFlash storage card also runs in True IDE Mode – making it electrically compatible with an IDE disk drive. The CF/CF+ connector consists of 50 pins with 11 address signals, 16 data signals, and other control signals.

Since most of the CF/CF+ cards in use today operate with a 3.3 V supply, and since the compact flash controller is embedded within the CPU and MCU, which is subject to the trend of decreasing I/O voltages (e.g., 1.8V), an external level shifter is required. The AVCA164245 or the AVCB164245 are ideal candidates for interfacing between these incompatible signal levels.



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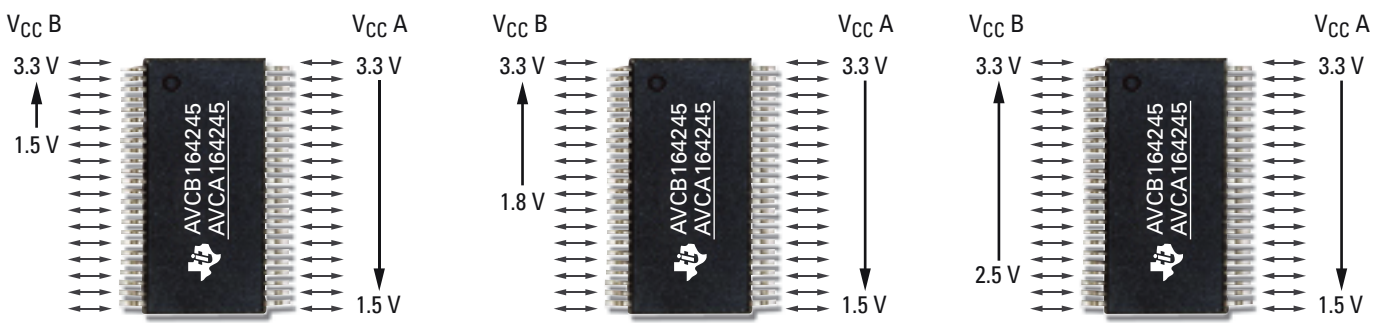
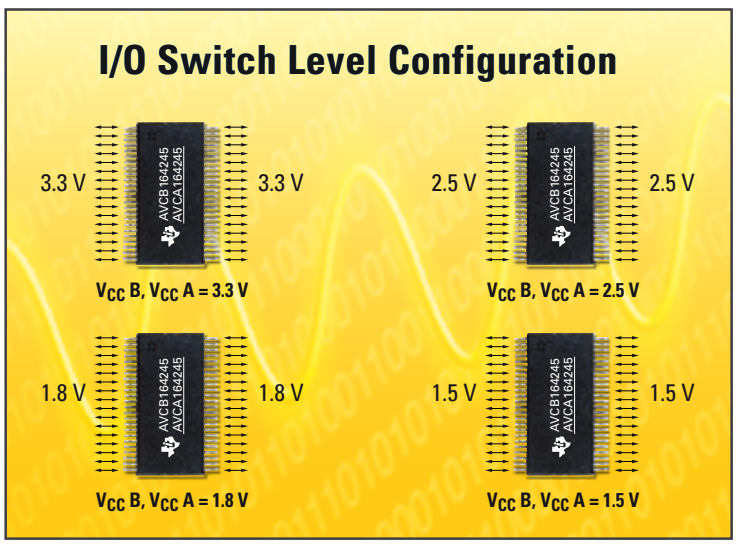
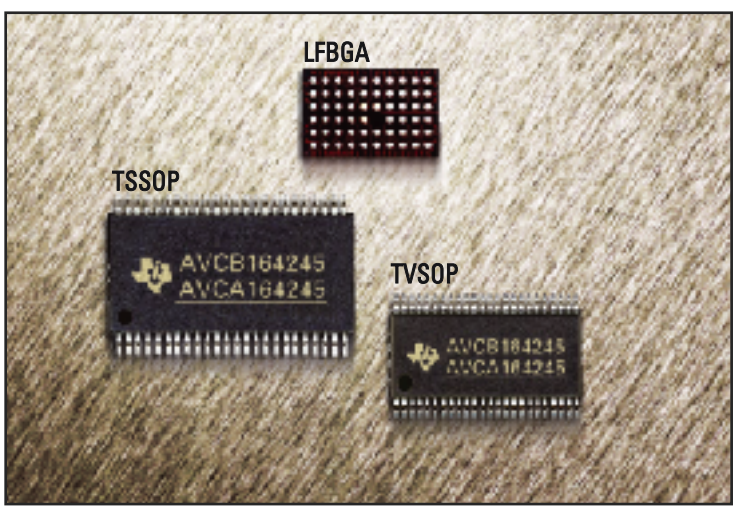
Flexible Level Shifter From 1.5 V to 3.3 V (16-bit)



I/O Switch Level Configuration





Input/Output Characteristics

The SN74AVCA164245 and SN74AVCB164245 translators are "split-rail" devices. One side is powered from V_{CC} A while the opposite side is powered from V_{CC} B. Logic I/O's on the "A" side follow V_{CC} A. Logic I/O's on the "B" side follow V_{CC} B. If V_{CC} A and V_{CC} B are powered from the same supply rail, then the device acts as a buffer with no translation. In total, 16 different level

Features

- Dynamic Drive Capability
  - ± 24 mA at 3 V V_{CC}
  - ± 15 mA at 2.3 V V_{CC}
  - ± 9 mA at 1.65 V V_{CC}
  - ± 6 mA at 1.4 V V_{CC}
- Control Inputs (DIR, OE#) levels are referenced to V_{CC} A (AVCA164245)
- Control Inputs (DIR, OE#) levels are referenced to V_{CC} B (AVCB164245)
- Over-voltage tolerant up to 3.6 V
- I_{off} supports partial power down mode

Target Applications

For More Information

Product Folder:
www.ti.com/sc/device/sn74avca164245
www.ti.com/sc/device/sn74avcb164245
Data Sheet:
www-s.ti.com/sc/techlit/sces395
www-s.ti.com/sc/techlit/sces394
Application Note:
www-s.ti.com/sc/techlit/scea030
Translation Homepage:
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