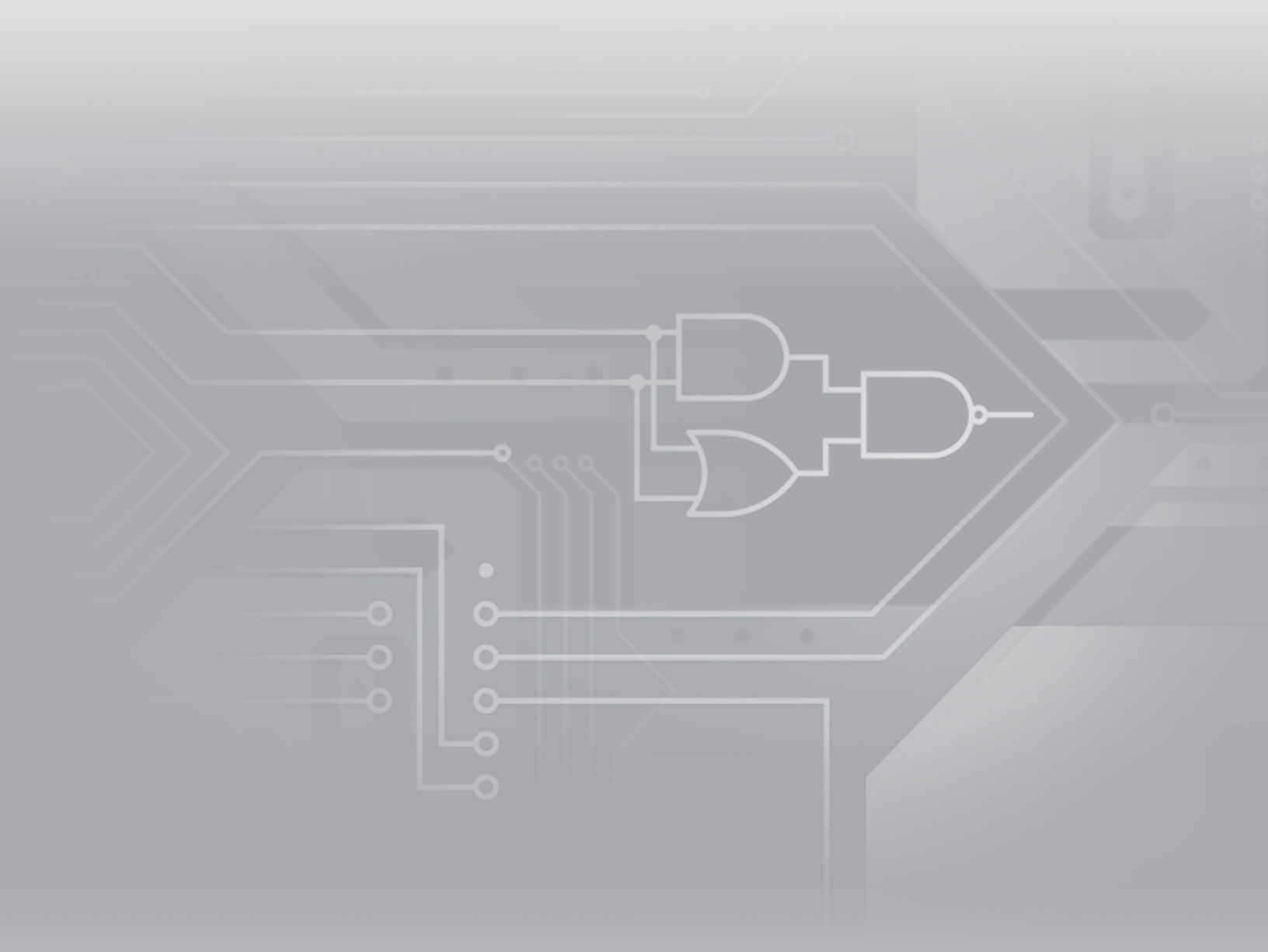
Voltage Translation Selection Guide for Image Sensors

Auto-Direction Sensing • Direction Controlled • Application-Specific

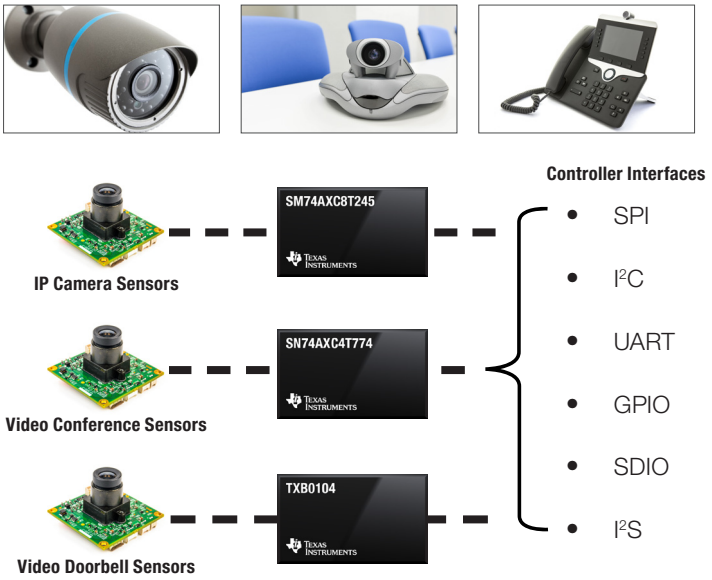


ti.com/voltage-level-translation

Enabling Image Sensor to Processor Interfaces with Level Translation

Image sensor technology is being integrated into many of today's applications to enable video recording, imaging scanning, machine vision, and occupancy detection to name just a few. The combination of image sensing and software has made adding an image sensor to any application a worthy consideration to enable different application usage models.

Given the multitude of different image sensors available in the market today, designers need flexibility in selecting the correct image sensor for their application needs. Level translation devices are enabling system designers to select the optimal image sensor for their application without having to worry about interfacing the sensor with the rest of their system as a result of voltage mismatch that may occur. Given the wide variety of interface and voltage level combinations, using simple level shifter devices enables optimal sensor selection. The table below provides a simple selection guide based on interface and voltage levels that need to translated.
For more information, visit www.ti.com/translation.



Overview of device families

Family	AXC	AVC	LVC	LSF	TXB	TXS	AUP	LV1T
Class	Direction controlled			Auto directional			Uni-directional	
Interfaces supported	Push-Pull			Open-drain or push-pull	Push-pull	Open-drain	Push-pull	
V_{CC} (V)	0.65 – 3.6	1.2 – 3.6	1.65 – 5.5	0.9 – 5.5	1.2 – 5.5	1.2 – 5.5	0.9 – 3.6	1.65 – 5.5
Drive strength (mA)	12	12	32	—	0.02	0.02	4	8
Max data rate (Mbps)	380	340	300	200	140	100	380	100
Max bits	8	32	16	8	8	8	1	1

Select by interface					
Interface	2 Ch	4 Ch	6 Ch	8 Ch	16 Ch
SPI	—	SN74AXC4T774 TXB0104	—	SN74AXC8T245	SN74AVC16T245
UART	—	SN74AXC4T774 SN74AXC4T245 TXB0104	—	SN74AVC8T245 SN74AXC8T245	SN74AVC16T245
JTAG	SN74AXC2T245	SN74AXC4T774 SN74AXC4T245 TXB0104	—	SN74AXC8T245	SN74AVC16T245
I²S	—	TXB0104 SN74AXC4T245 SN74AXC4T774	SN74AVC6T622	SN74AXC8T245	SN74AVC16T245
I²C	TXS0102 LSF0102	TXS0104E LSF0204	—	TXS0108E LSF0108	—
MDIO	TXS0102 LSF0102	TXS0104E LSF0204	—	TXS0108E LSF0108	—
SMBus	TXS0102 LSF0102	TXS0104E LSF0204	—	TXS0108E LSF0108	—
RMII/RGMII	—	—	TXB0106	SN74AXC8T245 SN74AXCH8T245	SN74AVC16T245
Quad-SPI	—	—	TXB0106	—	—
SDIO	—	LSF0204 TXS0206	—	LSF0108	—

Sensor Interfaces Data **Control**

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