HD74ALVC165245 and HD74ALVC166245 Ultra-Low-Voltage, High-Speed Voltage translator ICs Operate on as Low as 1.2 Volts and Support 16-Bit Data Transfer

— Designed for use in low-voltage, high-speed systems such as digital cameras and mobile phones. Performs rapid level conversion (bidirectional) between different signal voltages ranging from 1.2 to 3.6 V. —

Tokyo, February 19, 2003 — Hitachi, Ltd. (TSE: 6501) today announced the development of the HD74ALVC165245 and HD74ALVC166245 , two ultra-low-voltage, high-speed voltage translator ICs. Designed to be used for data transfer within systems containing ICs operating on differing voltages, they provide efficient signal transfer between differing voltage levels. Both support a 16-bit bus width and can operate on as low as 1.2 volts, making them ideal for compact, low-voltage, high-speed systems such as digital cameras and mobile phone handsets. Sample shipments will begin in April 2003 in Japan

This series of voltage translator IC products enables high-speed bidirectional data transfer between different voltages ranging from 1.2 to 3.6 volts, with minimal power consumption. Over a 16-bit bus they support a data transfer rate (pin-to-pin delay: tpd) of 4.4 ns maximum (VccA = 3.3 ± 0.3 V, VccB = 2.5 ± 0.2 V). In addition, they incorporate an I/O tolerant function that reduces system power consumption by preventing current from flowing into the voltage translator IC when the system is powered down.

[Background]

In recent years compact, battery-powered products such as digital cameras and mobile phones have become significantly smaller and faster. At the same time the trend toward low-voltage electronic devices has accelerated with the aim of extended battery life. The power supply voltage of key components such as CPUs and DSPs, for which fast operation is essential, has dropped below 2.5 volts to as low as 1.8 volts, and this trend is continuing. Nevertheless, low-voltage versions of peripheral components are sometimes not available, with the result that it is not unusual for a system to incorporate on the same circuit board components that employ different signal voltage levels. High-speed voltage translator ICs, which allow smooth level conversion between differing signal voltage levels, have thus become a very promising product category.

Hitachi is currently mass producing low-voltage (bidirectional) voltage translator ICs such as the HD74LVCC3245A, which supports data transfer over an 8-bit bus and a signal voltage range of 2.3 to 5.5 volts. However, as key devices have achieved still lower voltage levels and higher speeds, the company has gone on to develop the HD74ALVC165245 and HD74ALVC166245 , which support signal voltage levels as low as 1.2 volts and even higher speed data transfer.

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[About these Products]

The HD74ALVC165245 and HD74ALVC166245 employ the same 0.35 µm process as Hitachi's HD74ALVC Series low-voltage, high-speed standard logic IC. They support power supply voltages ranging from 1.2 to 3.6 volts and a high-speed data transfer rate (pin-to-pin delay: tpd) of 4.4 ns maximum (VccA = 3.3 ± 0.3 V, VccB = 2.5 ± 0.2 V).

The HD74ALVC165245 and HD74ALVC166245 also incorporate an I/O tolerant function that protects the voltage translator IC from damage if a voltage in excess of the normal operating voltage is applied to it. It prevents any unnecessary current flow if a voltage higher than Vcc is applied to any of the I/O pins at times when the voltage translator IC does not need to operate, during such a partial power-down of the system. This feature helps to limit power consumption and is ideal for battery-powered portable products such as mobile phones.

Finally, the drive capacity (output current) of the voltage translator IC is 24 mA (Vcc = 3.3 V), which is suitable for bus drive.

This series of voltage translator IC products uses two power supply voltages (VccA and VccB). The HD74ALVC165245 is designed for systems in which the control signal power supply voltage (VccB) is lower than that of other devices (VccA > VccB). The HD74ALVC166245 is designed for systems in which the control signal power supply voltage (VccB) is higher than that of other devices (VccA < VccB).

Both the HD74ALVC165245 and HD74ALVC166245 employ a 48-pin TSSOP package (external dimensions: 8.1 mm × 12.5 mm × 1.20 mm (typical)) to meet the requirements of compact systems.

< Typical Applications >

Compact, battery-powered, high-speed systems such as digital cameras, mobile phones, and laptop PCs.

< Prices in Japan > (For Reference)

Product Code	Unit price for orders of 10,000 or more (yen)
HD74ALVC165245	150
HD74ALVC166245	150

< Specifications >

1. HD74ALVC165245 Electrical Specifications

Item		Symbol	Conditions	Standard min.	Standard max.	Unit
Maximum Ratings	Power supply voltage	VccA, VccB		- 0.5	4.6	V
	Input voltage	VI		- 0.5	4.6	
	Power supply current	IccA, IccB, IGND			100	mA
Recommended conditions	Power supply voltage	VccA		1.4	3.6	V
		VccB		1.2	2.7	
	Input voltage	VI		0	3.6	
	Through rate	$\Delta t/\Delta v$		0	10	ns/V
	Operating temperature	Ta		- 40	85	°C
Electrical Characteristics	Output voltage	VOLA	VccA = 3.3 V ± 0.3 V, VccB = 1.65 V to 2.7 V, IOL = 24 mA		0.55	V
		VOLB	VccA = 3.3 V ± 0.3 V, VccB = 2.5 V ± 0.2 V, IOL = 18 mA		0.6	
		VOHA	VccA = 3.3 V ± 0.3 V, VccB = 1.65 V to 2.7 V, IOH = - 24 mA	2.2		
		VOHB	VccA = 3.3 V ± 0.3 V, VccB = 2.5 V ± 0.2 V, IOH = - 18 mA	1.7		
	Power-off leak current	IOFF	VccA, VccB = 0 V, Vin or Vout = 0 V to 3.6 V	0	10	μA
	Static current consumption	IccA	VccA = 3.6 V, VccB = 2.7 V, Io (A port) = 0, Bin = VccB or GND		20	μA
		IccB	VccA = 3.6 V, VccB = 2.7 V, Io (B port) = 0, Ain = VccA or GND		20	
	Pin-to-pin delay	tpd	VccA = 3.3 V ± 0.3 V, VccB = 2.5 V ± 0.2 V, CL = 30 pF, RL = 500 Ω	0.6	4.4	ns
Package	48-pin TSSOP package (Hitachi package code TTP-48DBV; V at end indicates “lead-free.”) External dimensions: 8.1 mm × 12.5 mm × 1.20 mm (typical)					

2. HD74ALVC166245 Electrical Specifications

Item		Symbol	Conditions	Standard min.	max.	Unit
Maximum Ratings	Power supply voltage	VccA, VccB		- 0.5	4.6	V
	Input voltage	VI		- 0.5	4.6	
	Power supply current	IccA, IccB, IGND			100	mA
Recommended conditions	Power supply voltage	VccA		1.2	2.7	V
		VccB		1.4	3.6	
	Input voltage	VI		0	3.6	
	Through rate	$\Delta t/\Delta v$		0	10	ns/V
	Operating temperature	Ta		- 40	85	°C
Electrical Characteristics	Output voltage	VOLA	VccA = 2.5 V ± 0.2 V, VccB = 3.3 V ± 0.3 V, IOL = 18 mA		0.6	V
		VOLB	VccA = 1.65 V to 2.7 V, VccB = 3.3 V ± 0.3 V, IOL = 24 mA		0.55	
		VOHA	VccA = 2.5 V ± 0.2 V, VccB = 3.3 V ± 0.3 V, IOH = - 18 mA	1.7		
		VOHB	VccA = 1.65 V to 2.7 V, VccB = 3.3 V ± 0.3 V, IOH = - 24 mA	2.2		
	Power-off leak current	IOFF	VccA, VccB = 0 V, Vin or Vout = 0 V to 3.6 V	0	10	μA
	Static current consumption	IccA	VccA = 2.7 V, VccB = 3.6 V, Io (A port) = 0, Bin = VccB or GND		20	μA
		IccB	VccA = 2.7 V, VccB = 3.6 V, Io (B port) = 0, Ain = VccA or GND		20	
	Pin-to-pin delay	tpd	VccA = 2.5 V ± 0.2 V, VccB = 3.3 V ± 0.3 V, CL = 30 pF, RL = 500 Ω	0.6	4.4	ns
Package	48-pin TSSOP package (Hitachi package code TTP-48DBV; V at end indicates “lead-free.”) External dimensions: 8.1 mm × 12.5 mm × 1.20 mm (typical)					

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Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
