Texas Instruments

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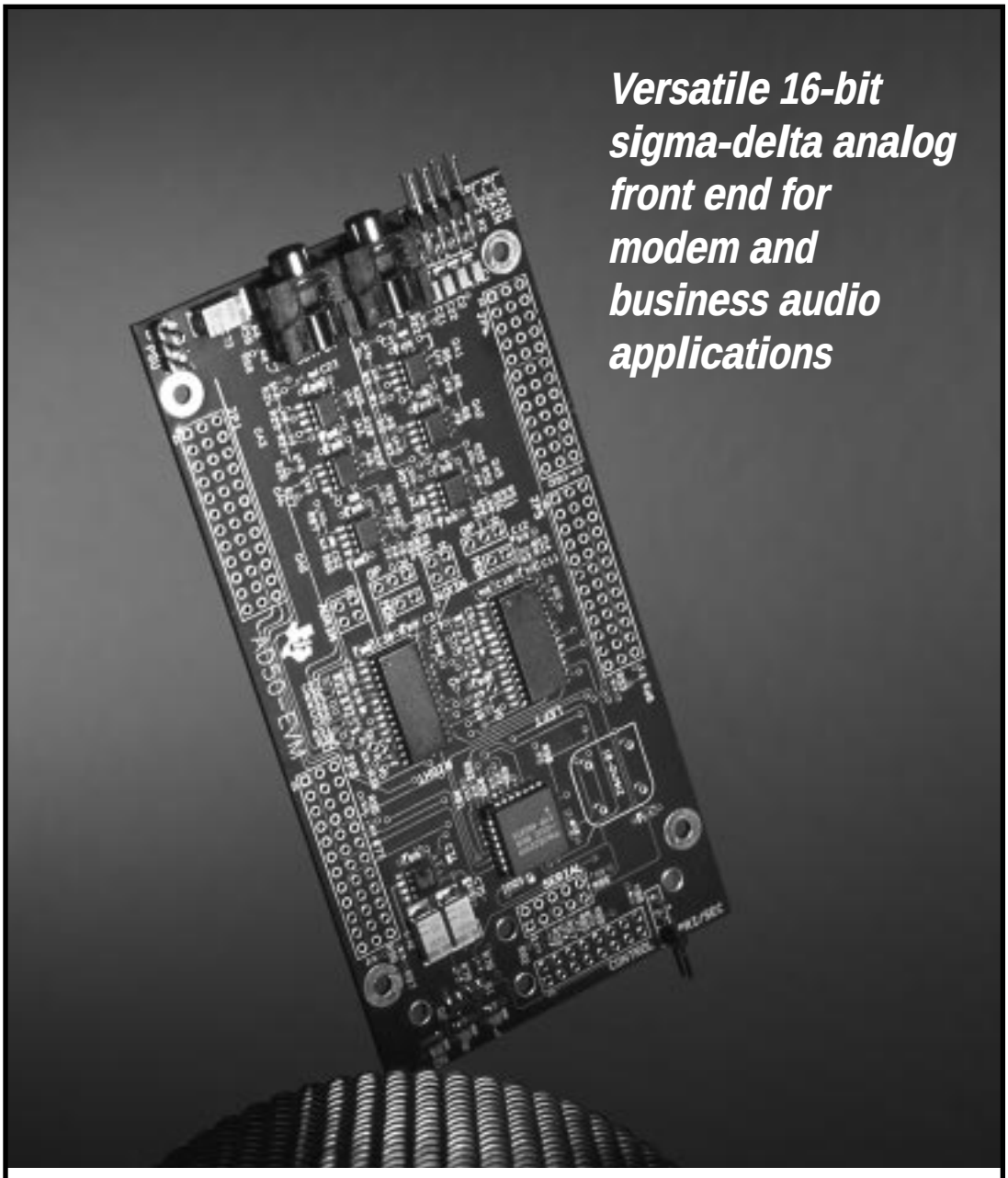
VOLUME 24

MIXED SIGNAL & LINEAR

Showcase

Inside



TLC320AD50
Page 3

POWER SUPPLY

Optoisolated feedback amplifier with 1.24 V precision voltage reference

Product Features

- Integrated precision reference and opto-coupler
- 1.0% Reference voltage tolerance
- 2 Current transfer ratios: 100% to 400%, and 150% to 300%
- Characterized for operation from –40°C to 100°C

The design of the isolated feedback loop for off-line 3.3 V switch mode power supplies has become easier and more cost effective with the introduction of the TPS5908/10 Opto-Isolated Feedback Amplifier. The TPS5908/10 consists of the TLV431 (1.24 V programmable voltage reference with 1% reference voltage tolerance) and an opto-coupler in the same 8-pin package. These devices are primarily intended for use as the combination, error, reference, and isolation amplifier in isolated 3.3 V AC/DC power supplies and DC/DC converters. This device provides reduced component count and saves space without sacrificing performance.

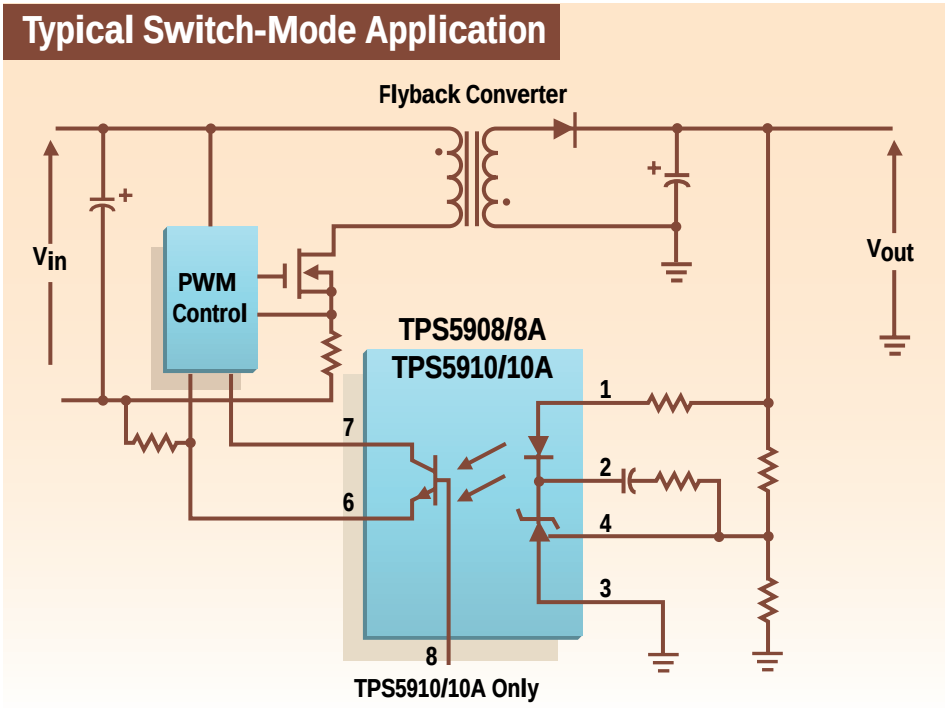
The opto-coupler portion is a 940 nm GaAs LED and a silicon phototransistor. The LED has a typical forward voltage of 1.2 V. The TPS5908/10 operates as a comparator with an optically coupled output. The TPS5910 is identical to the TPS5908 with the added feature of having the base of the phototransistor brought out to an external pin which provides greater flexibility in loop design.

Both of these devices are available in two different ranges of current transfer ratios (CTR). The CTR range for the standard device is 100% to 400% and for the 'A' versions the CTR is 150% to 300%.

The TPS5908/10 is available in an 8-pin DIP and an 8-pin Gull-wing package (DCS).

Check box 01 for a datasheet.

Typical Switch-Mode Application



Suggested resale price

Quoted per device in quantities of 1,000

TPS5908/DCS: $0.97

TPS5908A/ADCS: $1.02

TPS5910/DCS: $0.97

TPS5910A/ADCS: $1.02

M U L T I M E D I A

EVM available for TLC320AD50 DSP analog interface

An EVM is now available to evaluate the performance of the TLC320AD50 analog interface circuit (AIC). The 'AD50 is a versatile 16-bit sigma-delta analog front end for modem and business audio applications. It provides high resolution signal conversion using an oversampling sigma delta technique. The AD50 has internal 64 X oversampling on the ADC and 256 X oversampling on the DAC. The TLC320AD50 has a glueless interface, via a serial port, to the TMS320 family of digital signal processors (DSPs) reducing overall system cost and board space.

This EVM can be directly connected to the TMS320C54x DSP Starter Kit (DSKplus), or to any other system with a compatible synchronous serial interface. The kit comes complete with a data manual and applications report which describes the evaluation board and how to use it to demonstrate the performance of the TLC320AD50. The application report also describes the connections of the EVM to the DSK.

The TLC320AD50 AIC includes master/slave capability with support for up to three slaves, allowing this device to be used in multiple AIC applications such as voice enabled modems. It also provides differential outputs that can drive a 600 Ω differential load.

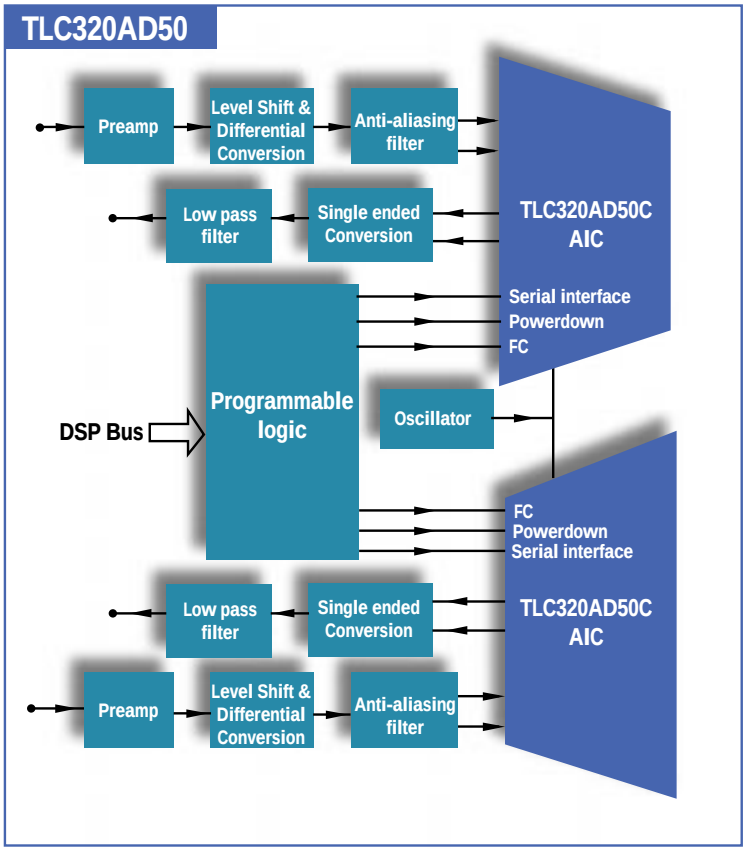
The 'AD50 offers excellent noise performance with typical signal to distortion ratio of 90 dB and typical signal to noise ratio of 89 dB on the ADC and DAC. With a 3-V digital interface, power down mode and low power dissipation of only 120 mW typical this device is ideal for battery operated equipment and interfacing to 3-V DSPs.

Additional features of the TLC320AD50 include: selectable conversion rate, reset, power-down, communications protocol, serial clock rate, gain control and system test mode (digital and analog loopback test mode).

Key applications of this device include V.34+ Modems, PCMCIA Fax Modems, DSP Analog Interface, Industrial Process Control, Acoustical Signal Processing, Noise Cancellation / Suppression, and general purpose data conversion.

The TLC320AD50 device is available in 28-pin SOIC (DW) and 48-pin TQFP (PT) packages.

Check box 02 for a datasheet.



Product Features

- 16-bit Sigma Delta converter
- Master/Slave Mode (supports up to 3 slaves)
- Differential output drives 600 Ω load
- Single 5-V supply or 5 V analog and 3 V digital
- Power-down mode to 7.5 mW
- Glueless DSP interface
- Characterized for operation from 0°C to 70°C

OPTOELECTRONICS

300 DPI linear sensor array with hold

Product Features

- 102 x 1 Sensor Array
- 300 DPI
- High speed operation, up to 2 MHz
- High sensitivity
- Characterized for operation from 0°C to 70°C

The TSL1301 is a 300 dots-per-inch (DPI) CMOS linear sensor array. It consists of a 102 x 1 array of photodiodes with associated charge amplifier circuitry and a pixel data hold function that provides simultaneous integration start and stop times for all pixels. Operation is simplified by internal logic requiring only a serial-input pulse and a clock.

A cost-effective device, the TSL1301 is designed for a wide variety of applications such as mark and code reading, optical character recognition (OCR), contact imaging, edge detection, edge positioning, and optical encoding.

The TSL1301 offers high sensitivity (saturation exposure 7 nJ/cm^2 at 565 nm wavelength) for a faster scan rate, lower cost illumination, and higher signal-to-noise ratio (SNR). With its low noise, low pixel response non-uniformity (PRNU), and low non-linearity, the TSL1301 is sufficient for 256 gray-scale (8-bit) applications. The device also features synchronous integration to minimize image skewing.

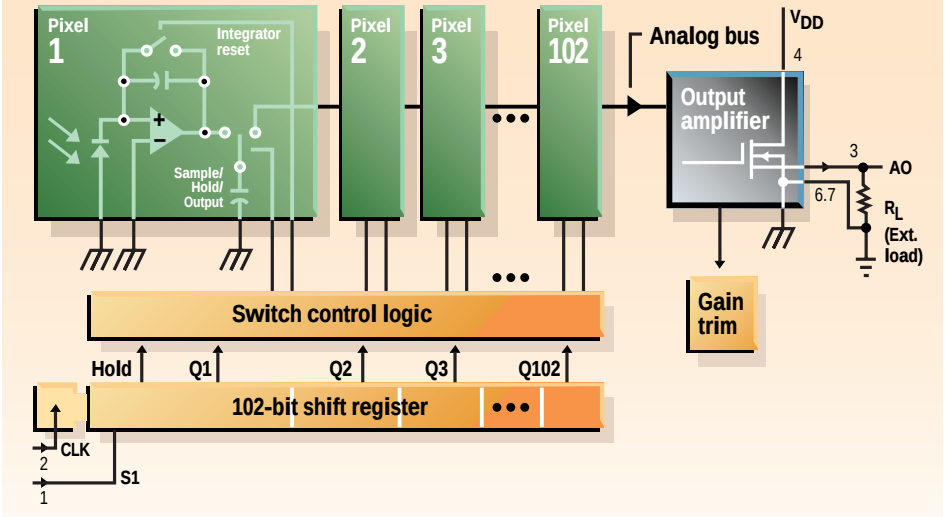
This device is targeted for high speed and cost sensitive applications such as scanners, bar code readers, and paper currency readers. Compared to compatible charge-coupled-device (CCD) solutions, the TSL1301 is a user friendly, low cost device. Other benefits include:

- Output referenced to ground – reduced circuit design for simplified layout
- Low image lag, 0.5% typ – enhanced system performance for high speed applications
- Single 5-V supply – simplified design for ease of use

The TSL1301 is available in the 8-pin clear DIP.

Check box 03 for a datasheet.

A functional diagram of the TSL1301



Suggested resale price

Quoted per device in quantities of 1,000

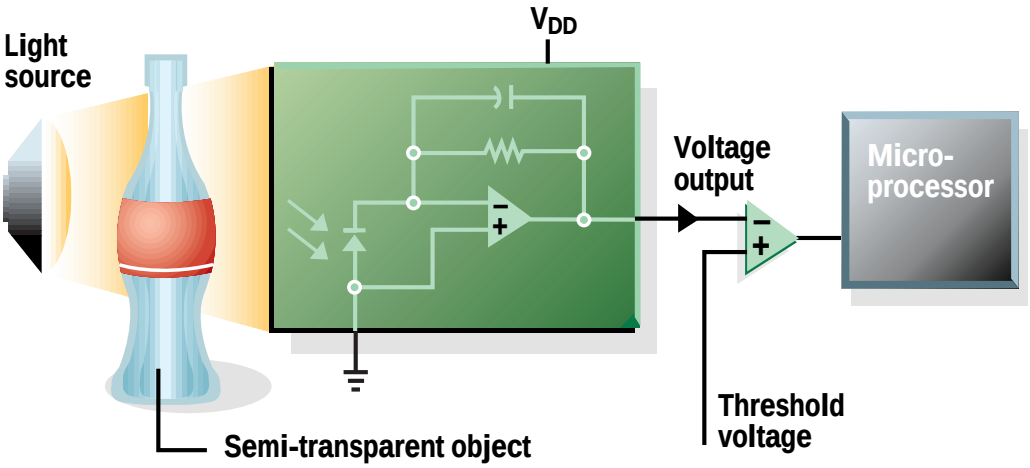
TSL1301: $3.45

For more information, call 1-800-477-8924, ext. 3224

OPTOELECTRONICS

Precision Hi-Speed Light-to-Voltage Converters

Shedding light on the TSL253/TSL254



The TSL253 and TSL254 are the latest additions to the optoelectronics family of precision high-speed light-to-voltage converters. The TSL253 and TSL254, each integrates a 1-mm square photodiode and a transimpedance amplifier (feedback resistor of 16 MΩ for TSL253 and 1 MΩ for TSL254). Utilizing advanced silicon-gate LinCMOS™ technology, these new devices offer improved amplifier offset-voltage stability and low power consumption.

These devices provide high speed and high sensitivity at a low cost-to-performance ratio providing cost effective solutions for applications such as lighting controls, proximity sensors, and light metering. The TSL253 and TSL254 offer added benefits over discrete solutions to suit your light sensor needs. These added benefits include:

- Low dark (offset) voltage, 10 mV, max – high dynamic range
- Single supply operation – simplified design for ease of use
- Low supply current, 600 µA, typ – well-suited for portable/low power applications

The TSL253 and TSL254 are available in a compact 3-leaded clear plastic package for board savings and cost.

Check box 04 for a datasheet.

Product Features

- Integrated solution w/ photodiode and transimpedance amplifier
- High irradiance responsivity
  – TSL253: 60 mV/(µW/cm^2) typ
  – TSL254: 3.5 mV/(µW/cm^2) typ
- High bandwidth
  – TSL253: 7.5 µs typ (tr/tf)
  – TSL254: 2 µs typ (tr/tf)
- Characterized for operation from –25°C to 85°C

Suggested resale price

Quoted per device in quantities of 1,000

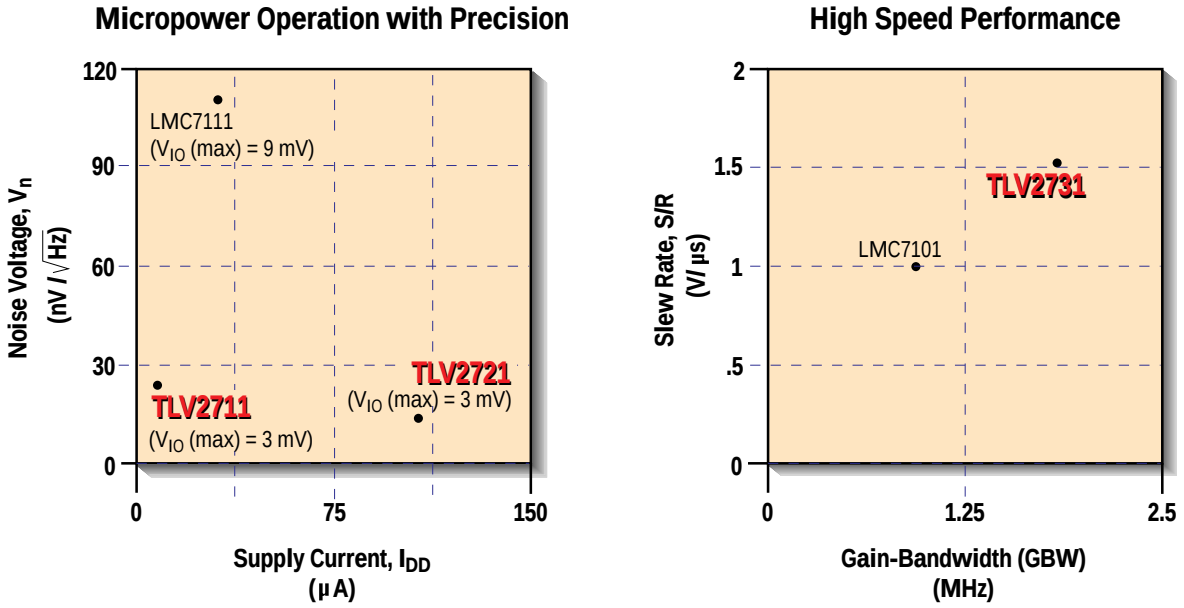
TSL253:	$0.90
TSL254:	$0.90

OPERATIONAL AMPLIFIERS

Low-power rail-to-rail op amps in SOT-23

Product Features

- Rail-to-rail output
- Micropower …I_{DD} = 25 µA (max) – TLV2711
- High speed …BW = 2 MHz, S/R = 1.6 V/µs – TLV2731
- Low noise voltage… V_n = 15 nV/√Hz –TLV2731
- 0°C to 70°C and –40°C to 85°C temperature grades



Suggested resale price

Quoted per device in quantities of 1,000

TLV2711CDBV: $0.64

TLV2711IDBV: $0.69

TLV2721CDBV: $0.64

TLV2721IDBV: $0.69

TLV2731CDBV: $0.64

TLV2731IDBV: $0.69

The TLV2711, TLV2721, and TLV2731 are a family of low voltage rail-to-rail op amps in the SOT-23 package. These products provide a choice of either high speed performance or micropower operation in battery powered and space-conscious applications.

The TLV2711 is a micropower device targeted at battery-powered systems where power consumption needs to be minimized. It has a maximum supply current of 25 µA (V_{DD} = 5 V). DC applications are well served with an input offset voltage of 400 µV (typ) and a 3 V noise floor of 22 nV/√Hz – one fourth of the nearest competitor's micropower SOT-23 op amps.

The TLV2731 has a bandwidth of 2 MHz and a slew rate of 1.6 V/µs for applications requiring better ac performance. It has a noise floor of 15 nV/√Hz and can drive 600 Ω loads for telecom applications.

The TLV2721 offers a compromise between the micropower TLV2711 and the ac performance and output drive of the TLV2731. All three devices are rated for operation from 2.7 V to 10 V, and specified and characterized at both V_{DD} = 3 V and 5 V. The TLV27x1 family is pinout compatible with National Semiconductor and provides significantly better performance in power consumption, precision, and speed.

The SOT-23 package is one third the size of an SOIC-8 and lets designers place single amplifiers very near the signal source, minimizing noise pick-up from long PCB traces. Furthermore, amplifiers can be built into sensors or squeezed into tightly packed layouts.

The TLV2711/21/31 are available in an ultra-small SOT-23 package.

Check box 05 for a datasheet.

For more information, call 1-800-477-8924, ext. 3224

OPERATIONAL AMPLIFIERS

High output drive rail-to-rail op amp consumes only 50 µA per channel

The TLV2422 is a micropower rail-to-rail CMOS dual op amp designed for low voltage applications. It is the latest addition to Texas Instruments broad portfolio of rail-to-rail CMOS amplifier products. The device consumes only 50 µA (typ) of supply current per channel making it ideal for battery powered systems. It has a supply voltage range from 2.7 V to 10 V and along with micropower consumption makes it a good choice for portable equipment. It is characterized at both 3 V and 5 V.

This op amp has low input bias current (I_{IB} = 1 pA) for interfacing to high impedance sensors. Precision dc applications are also well served with an input offset voltage of 300 µV (typ) and a 5 V noise level of only 18 nV/√Hz. This noise level is the lowest in industry for micropower CMOS op amp solutions.

The product features wide dynamic range on both the input and output. The input common mode range includes the negative rail and swings to within 0.25 V of the positive rail. The output provides full rail-to-rail performance with increased output drive. While only consuming micro ampere levels of current, the TLV2422 can drive 600 Ω loads for telecom applications.

The TLV2422 is the third member of a family of high output drive rail-to-rail CMOS op amps. The TLV2442 and TLV2432 are the high speed and low power members respectively. The TLV2442 has 1.75 MHz of bandwidth and 1.3 V/µs slew rate for higher speed applications. The TLV2432 only requires a maximum of 250 µA (both channels) of supply current, but still provides 500 kHz of bandwidth.

All three products are available in an 8-pin SOIC and the ultra low profile 8-pin TSSOP.

Device	I_{DD}	I_{IB}	V_{DD}	V_{IO}	V_{ICR}	V_o	V_n	GBW	S/R
	mA (typ)	pA (typ/max)	V	mV (typ)	V (typ)	V (typ)	nV/√Hz (typ)	MHz (typ)	V/µs (typ)
TLV2422	0.1	1/150	2.7 to 10	0.3	–0.25 to 2.75	0.05 to 2.97	23	0.05	0.02
TLV2432	0.195	1/150	2.7 to 10	0.3	–0.25 to 2.75	0.02 to 2.98	22	0.5	0.25
TLV2442	1.5	1/150	2.7 to 10	0.3	–0.25 to 2.5	0.02 to 2.98	18	1.75	1.3

All parameters specified at V_{DD} = +3 V.

Check box 06 for a datasheet.

Product Features

- Micropower operation: I_{DD} = 50 µA per channel
- Rail-to-Rail output
- High input impedance (I_{IB} = 1 pA) for sensor interface
- Low noise: 18nV/√Hz (@ 1 kHz)
- 600 Ω output drive
- Specified over commercial (0°C to 70°C) and industrial (–40°C to 85°C) temp ranges

Suggested resale price

Quoted per device in quantities of 1,000

TLV2422CD: $0.80

TLV2422CPWLE: $0.88

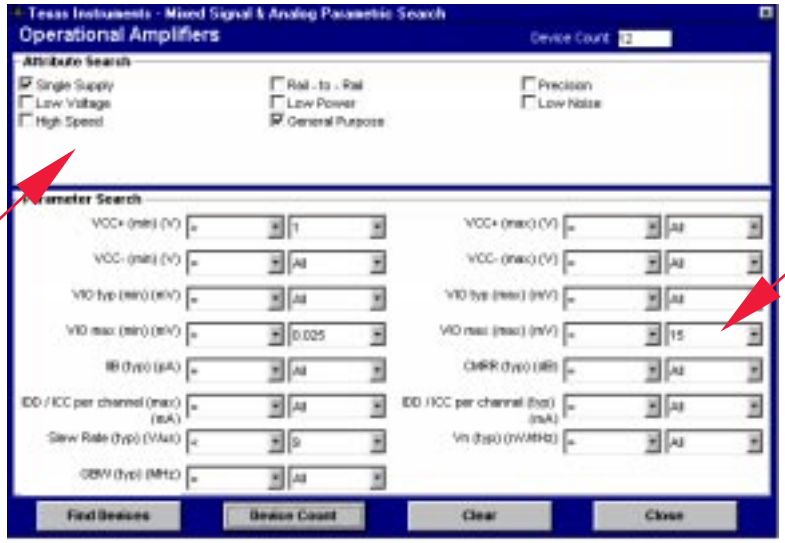
TLV2422AID: $0.95

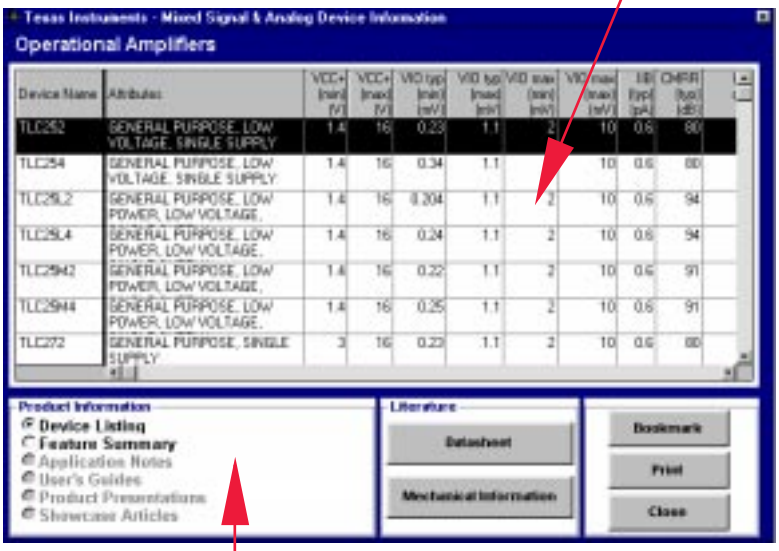
TLV2422ID: $0.88

TLV2422AIPWLE: $1.04

DESIGNER'S GUIDE

New CD-based "Designer's Guide and Data Book" allows for powerful searches





The latest version of InfoNavigator is now available containing approximately 20,000 pages of technical specifications and application notes. It includes a powerful search engine that will save designers time when they need to find the appropriate mixed-signal or analog device. By choosing parametrics or functionality, the search engine generates a table of products which meet the requirements. The user can review a high-level technical overview on each device before accessing comprehensive data sheets and application notes.

One important new feature in this version is the ability to download device updates from our World Wide Web site. This will enable users to get the latest details on our mixed signal and analog devices as soon as they become available.

■ **Check box 07** for CD-based Designer's Guide and Data Book.

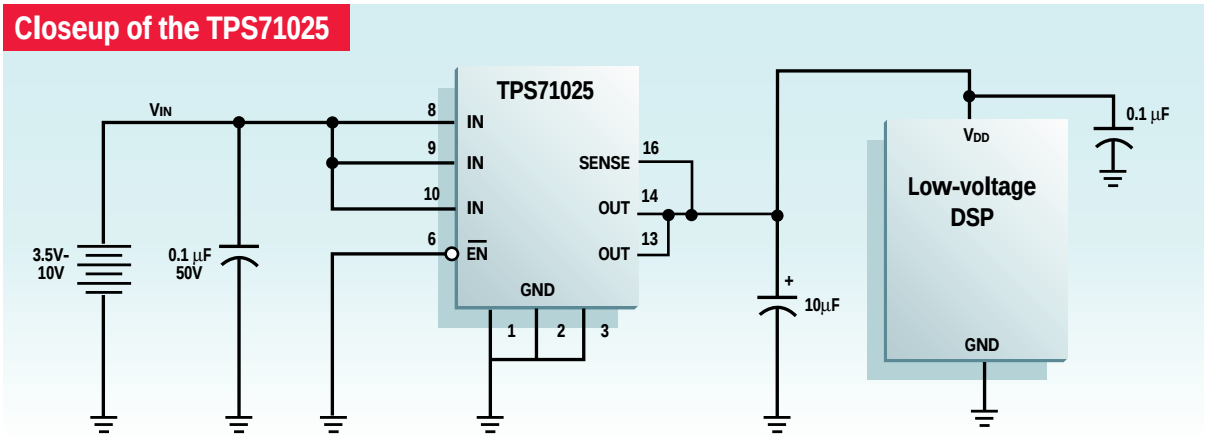
For more information, call 1-800-477-8924, ext. 3224

POWER SUPPLY

2.5 V Power management for DSP systems

Industry's first 2.5 V supply voltage supervisor operates on 16 µA

Closeup of the TPS71025



The TPS71025 offers designers an order of magnitude reduction in dropout voltage and quiescent current over conventional bipolar Low Dropout (LDO) Voltage Regulators. The latest member of the family of PMOS LDOs provides reduced power consumption and longer battery life in handheld and portable battery powered systems such as PDAs, palmtops, cellphones and other systems utilizing the emerging 2.5 V logic functions.

The TPS71025 uses a voltage controlled PMOS pass transistor. In contrast, bipolar regulators use a pnp pass element, the base current of which is directly proportional to the load current through the regulator. The PMOS pass transistor results in very low quiescent currents (typically 292 µA) that remain virtually constant over the regulator's full specified 500 mA output load. This pass transistor also acts as a low value resistor, less than one ohm, so the dropout voltage is extremely low when compared to conventional bipolar LDOs. Typical dropout voltage under a 100 mA load, for instance, is a mere 95 mV maximum.

The TPS71025's 2.5 V output is regulated to ± 2% voltage tolerance over the full specified range for line, load and temperature changes. For additional power savings, a TTL logic-enabled standby mode reduces power consumption to 0.5 µA maximum. This addresses a critical requirement to extend battery life in power sensitive applications. This device is available in the ultra-thin TSSOP package for space sensitive applications.

The TPS71025 is available in 20-pin TSSOP, 8-pin SOIC and 8-pin DIP.

Check box 08 for a datasheet.

Product Features

- Fixed 2.5 V output at 0 to 500 mA
- V_{DO} = 95 mV max at 100 mA
- I_Q = 292 µA
- Shutdown mode: 0.5 µA max
- ± 2% output tolerance
- Characterized for operation from 0°C to 125°C

Suggested resale price

Quoted per device in quantities of 1,000

TPS71025D: $1.11

TPS71025P: $1.11

TPS71025PWLE: $1.19

M U L T I M E D I A

EVM available for TLC320AD75C ADA converter

Product Features

- 20-Bit sigma-delta stereo ADA converter
- Low power dissipation of 400 mW (typ) with standby of 2 mW (typ)
- Separate ADC and DAC serial port interfaces
- 64X AD and 32X DA sigma-delta conversion
- SNR of 100 dB on ADC and 104 dB on DAC
- Characterized for operation from 0°C to 70°C

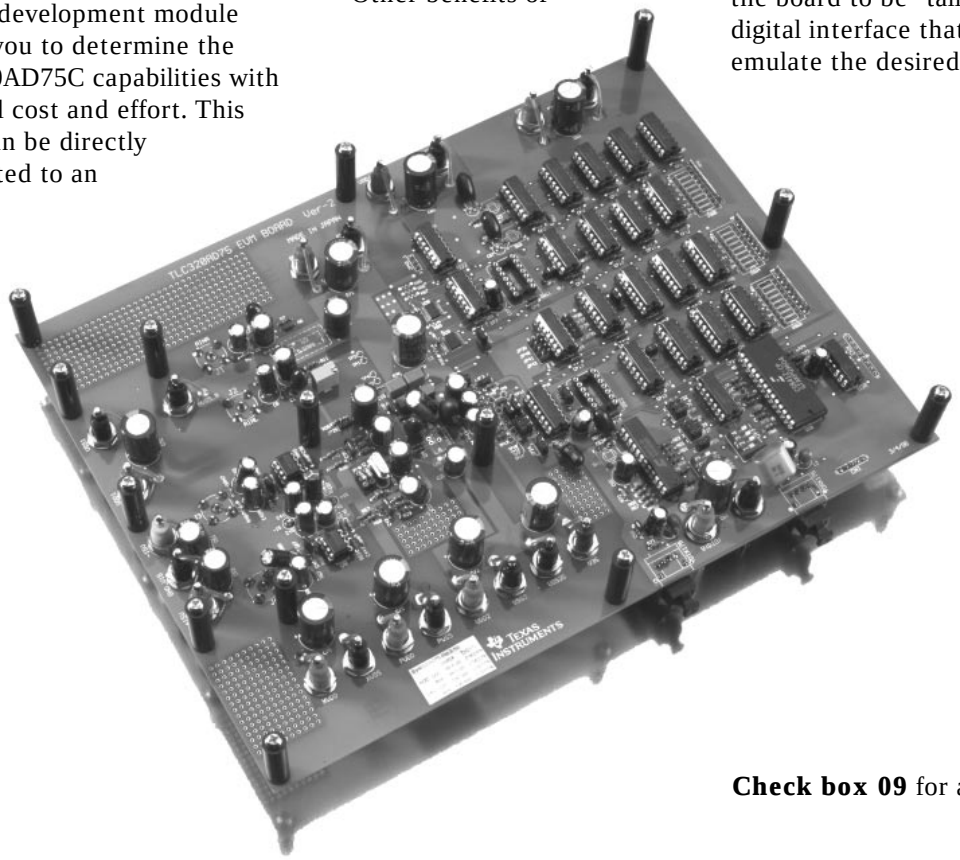
An evaluation module (EVM) is now available to assess the performance of the TLC320AD75C analog-to-digital and digital-to-analog (ADA) converter. The TLC320AD75C is a versatile 20-bit sigma-delta data converter for digital audio applications including digital radio, musical instruments, high performance personal computer audio, and high resolution industrial applications. The TLC320AD75C is available in a small 56-pin plastic small-outline package (SSOP).

The development module allows you to determine the TLC320AD75C capabilities with minimal cost and effort. This EVM can be directly connected to an Audio Precision System 1 or Audio Precision System 2 through the optical SPDIF (Sony Philips Digital Interface) input and output ports. For increased flexibility, the EVM also provides access to the TLC320AD75C serial port.

The EVM kit contains an instruction manual which describes the operation of the module, the schematic, and parts list. The instruction manual explains how to use the module and includes technical information to help you design your specific systems.

Other benefits of the TLC320AD75C EVM include:

- Demonstrated analog-to-digital conversion (ADC) performance of total harmonic distortion + noise (THD+N) of 0.0017% and signal-to-noise ratio (SNR) of 100 dB
- Demonstrated digital-to-analog conversion (DAC) performance of THD+N of 0.0013% and SNR of 104 dB
- “Open” board power system to allow evaluation of power supply and grounding strategy, and
- On board jumpers to allow the board to be “tailored” to the digital interface that may emulate the desired application.



Check box 09 for a datasheet.

For more information, call 1-800-477-8924, ext. 3224

W I R E L E S S

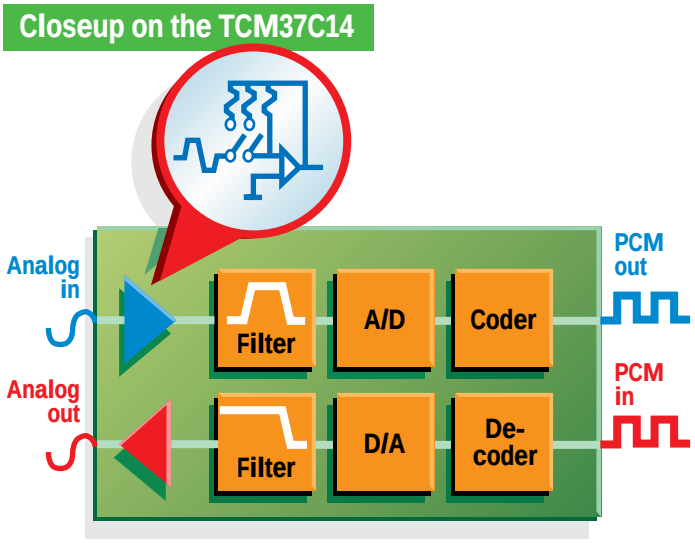
Programmable gain select is added to TI's combo family

The newest members of TI's PCM combo family, the TCM37C13A, TCM37C14A and the TCM37C15A, represent high-performance solutions for next-generation line-card and other voice-band applications. PCM combos are highly integrated voiceband pulse code modulated codecs with on chip filters. These devices provide a complete high-performance, low-noise solution to interface a full-duplex voice telephone circuit with a time-division-multiplexed (TDM) system.

These new devices offer reduced component counts with their simple, on-chip programmable gain select. This feature enables real-time gain selection without the expense and extra component count of a fully programmable gain system.

Although the most common application for combo devices is central office line card designs, these highly versatile Combos can be used in many application areas, including:

- Line interface for digital transmission and switching of T1 carrier
- PABX and central office telephone systems
- Subscriber line concentrators
- Digital encryption systems
- Digital voice-band data-storage systems
- PBX digital feature phones
- Digital signal processing



These devices are based on the proven core of the TCM29CXX family of combos and meet CCITT/(D3/D4) channel bank specifications. Both the C13A and C15A operate at 2.048 MHz and offer companding (µ-Law on the C13A, A-Law on the C15A). The TCM37C14A offers several additional features including a pin-selectable master clock rate (1.536, 1.544, and 2.048 MHz) for compatibility with many standard telecom backplane speeds and pin-selectable µ-Law/A-Law companding for use with either industry standard. The C14A also provides a differential output providing noise rejection and the capability of directly driving a transformer load.

The TCM37C14A is available in 24-pin small outline (DW) package and the TCM37C15A is available in the 20-pin DIP (N) and small outline (DW) packages. The TCM37C13A is sampling currently and will be released in the 20-pin DIP (N) and small outline (PW) packages.

Check box 10 for a datasheet.

Product Features

- Programmable Gain Select
- Differential Output (C14A)
- Pin selectable master clock rate (C14A)
- Power Down Mode
- Pin selectable µ-Law/A-Law companding (C14A)
- Characterized for operation from –40°C to 85°C

Suggested resale price

Quoted per device in quantities of 1,000

TCM37C14AIDW: $2.00

TCM37C15AIDW: $1.82

TCM37C15AIN: $1.82

DATA TRANSMISSION

Single chip interface solution for the 9-pin GeoPort™ host

- Single chip interface solution for the 9-pin GeoPort host (DTE)
- Designed to operate up to 4 Mbps full duplex
- ±5 V operation
- Backwardly compatible to AppleTalk™ and LocalTalk™
- Low shutdown current (typ 30 µA)
- Characterized for operation from 0°C to 70°C

The SN75LBC773 is the latest in Texas Instruments line of GeoPort transceivers 9-pin Universal Network Bus applications, enabling data transfer up to 4 million bits per second. This makes it ideal for applications such as high speed computer-to-digital telephone/PBX connections, digital still camera interfaces, and serial printer ports.

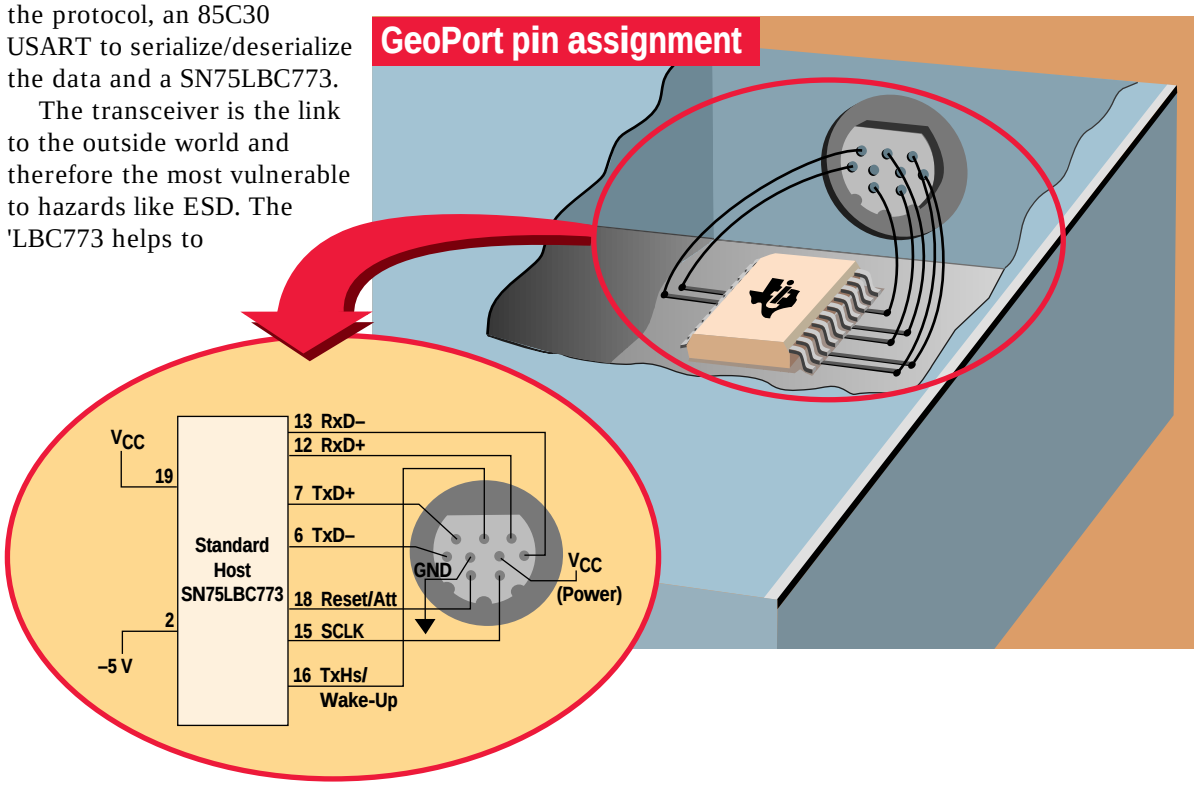
The GeoPort interface is a serial data bus that transfers data over a cable from one piece of equipment to another. The typical system consists of a controller that implements the protocol, an 85C30 USART to serialize/deserialize the data and a SN75LBC773.

The transceiver is the link to the outside world and therefore the most vulnerable to hazards like ESD. The 'LBC773 helps to minimize these types of risks with 10 kV of ESD protection, current-limiting and high-impedance outputs on shutdown and power-up. In addition, this device consumes 1/10th the power of comparable (35 mW typ) bipolar devices. A power down mode further reduces power consumption to 165 µW (typ).

The device operates from a ±5 V supply and allows high speed digital connections to telephony networks operating at ISDN and T1 data rates.

Many more applications require isochronous data flows such as video conferencing and voice/data transfers. Analog modems or other PC add-in cards can include the high-speed digital GeoPort link to increase interconnection options for minimal additional expense.

Check box 11 for a datasheet.



Suggested resale price

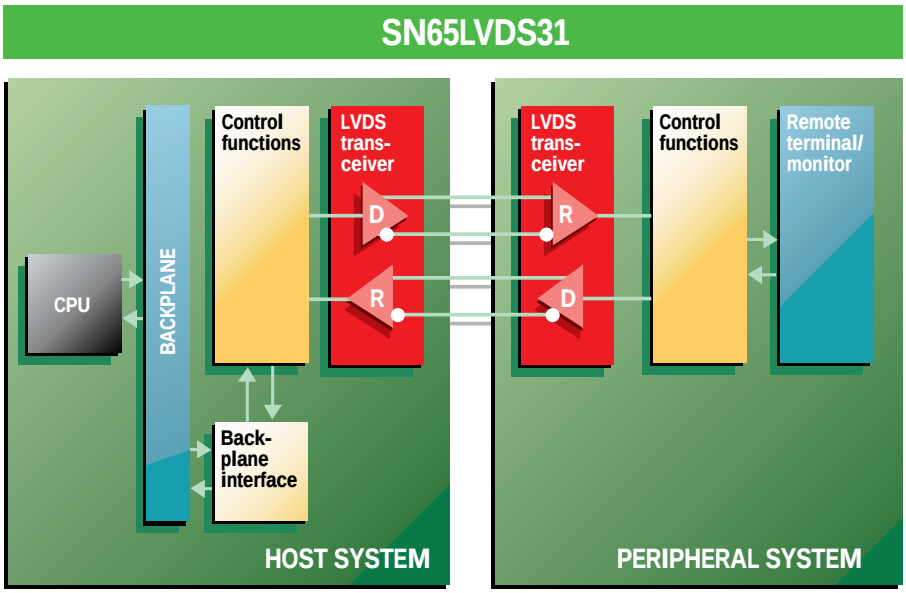
Quoted per device in quantities of 1,000

SN75LBC773DW: $1.12

For more information, call 1-800-477-8924, ext. 3224

DATA TRANSMISSION

400 Mbps, high-speed data transmission



The SN65LVDS31 quadruple differential driver and the complementary SN65LVDS32 quadruple differential receiver are new Low Voltage Differential Signaling (LVDS) products. These LVDS drivers and receivers operate from a single 3.3 V supply and are targeting general purpose high-speed data transmissions in both the telecommunications and computing markets. These devices were developed to address the need for a general purpose, high-speed data line interface standard.

The SN65LVDS31 accepts 3 V TTL/CMOS input levels and transforms them using current-mode drivers to deliver a differential output into a 100 Ω load. The driver has very low propagation delay times of 1.7 ns typically with sub-1 ns output voltage transition times to support data rates of up to 400 Mbps.

The SN65LVDS32 receives the low voltage differential signals and outputs low-voltage TTL to the communications controller. The receiver is capable of detecting signals as low as ±100 mV over a ±1 V common-mode input voltage range.

Due to the increased susceptibility to ESD events on the bus pins, protection is of the utmost importance. Both products have an ESD rating of ±8 kV (HBM).

These products are intended to be primarily used in a point-to-point communication over a controlled impedance media of 100 Ω. Both products are available in 16-pin Small Outline Integrated Circuit (SOIC) and is pin compatible with the AM26LS3x (5 V) and AM26LV3x.

Check box 12 for a datasheet.

Product Features

- Single 3.3 V Supply
- tr/tf typ = 750 ps (400 Mbps)
- Propagation Delay = 1.7 ns typ
- ESD – 8 kV
- Open-Circuit Fail Safe
- Characterized for operation from –40°C to 85°C

Suggested resale price

Quoted per device in quantities of 1,000

SN65LVDS31D: $3.47

P C I P R O D U C T S

PCI1220/1250A: Industry-leading CardBus solutions for tomorrow's applications

Product Features

PCI1220 Key Features:

- Programmable general purpose I/O pins

PCI1250A Key Features:

- PCI Power Management
- PC '97 Ready CardBus Controller
- TI Multifunction Interrupt Routing
- Four additional general purpose I/O pins
- Internal zoom video buffers
- Characterized for operation from 0°C to 70°C

Suggested resale price

Quoted per device in quantities of 1,000

PCI1220PDV: $16.46

PCI1250AGFN: $21.13

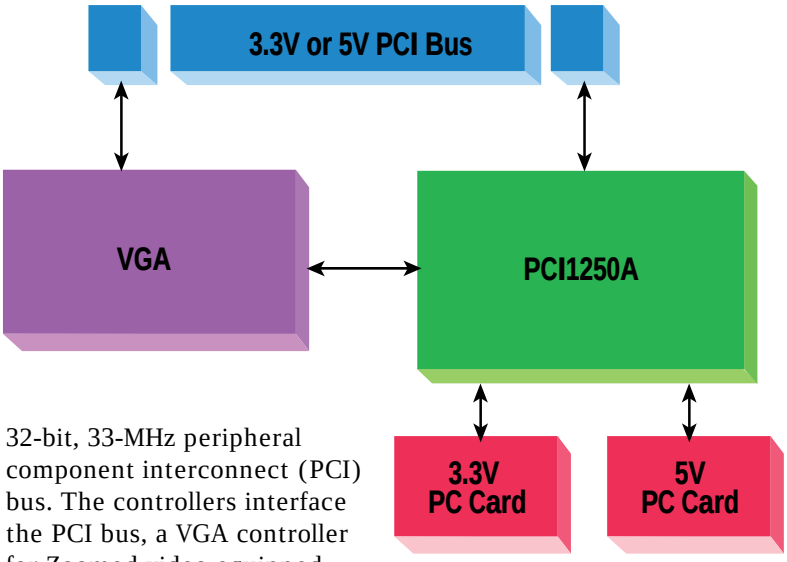
TPS2205DBLE: $3.61

TPS2205DAP: $3.67

TPS2206DBLE: $3.87

TPS2206DAP: $3.91

Portable computers will now be able to support the most demanding multimedia applications with the industry-leading performance of the PCI1250A and PCI1220 PCI-to-CardBus controllers. These devices use Texas Instruments' high-performance pipelined FIFO architecture, enabling data throughput up to 132 Mbytes/sec, which is the theoretical maximum for a 32-bit, 33-MHz peripheral component interconnect (PCI) bus. The controllers interface the PCI bus, a VGA controller for Zoomed video equipped systems, and two PC Card 16 or CardBus slots. These slots support insertable PC cards that access peripheral devices such as modems and local area networks (LANs). Zoomed Video allows full-motion video signals to be routed directly to the video controller, bypassing the PCI bus and freeing it up for use by the CPU and other devices.



The PCI1250A is the industry's most highly integrated PCI-to-Cardbus controller, with features such as programmable IRQ pin assignments, four additional general purpose I/O pins, and internal zoom video buffers on chip. The PCI1250A also offers enhanced burst mode data transfers and advanced power management to enable the highest performance you can receive from your PCI bus while consuming less power.

The PCI1250A includes several capabilities that simplify the task of designing a CardBus/PC Card controller into a wide range of system platforms. One such feature is programmable pin assignments for interrupts; with this technology, designers can program the routing of a PC's standard 15 interrupt signals so that they can be output to any of several pins on the PCI1250 controller. In addition, system designers can multiplex or combine more than one type of interrupt onto selected pins, increasing the design flexibility and options available to system engineers. The PCI1220 features are identical to the PCI1250A without the internal zoom video buffers.

These devices were specially designed to meet the needs of systems complying with the Microsoft® PC97 hardware design guidelines. The PCI1250A and PCI1220 support PC97s Advanced Configuration and Power Interface (ACPI) requirement for complete systems. They also allow Windows® operating systems to conserve battery life by powering down the CardBus controller when it is not in use and shutting down socket circuitry when a CardBus or PC Card is not inserted. Both devices will function in either 3.3 V or 5 V bus systems.

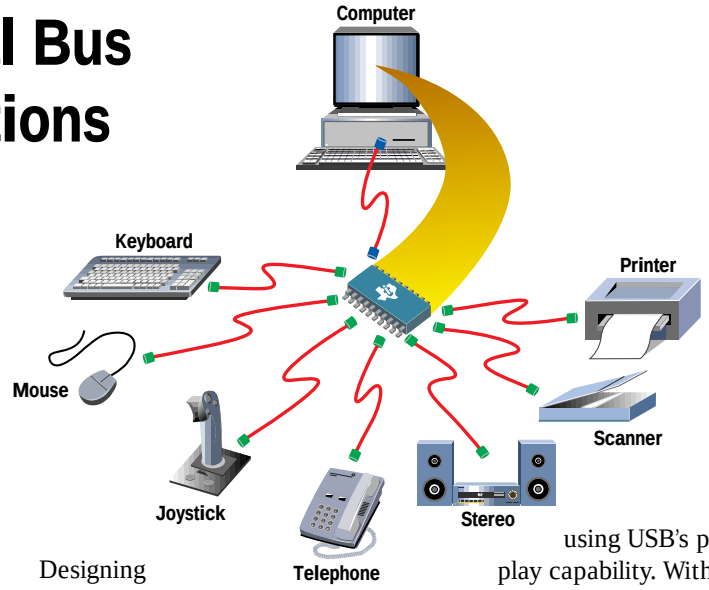
The PCI1250A is available in a 256-pin BGA package and the PCI1220 is available in a 208-pin TQFP package.

Check box 13 for a datasheet.

DATA TRANSMISSION

Universal Serial Bus (USB) hub solutions

Introducing two new hub devices, TUSB2040 and TUSB2070, that offer the full advantage of flexibility, expandability and ease of use of Universal Serial Bus (USB). The TUSB2070 is the industry's first seven port hub device and is ideal for home and small office computers that typically have a high peripheral count. The TUSB2070 supports two power modes, including a self-powered 7-port mode and a bus-powered 4-port mode. The low-power, 3.3 V device is an easy-to-use, integrated solution that incorporates all of the circuitry necessary to interface to a PC with USB capability. The TUSB2040 is a 4-port hub device designed to offer maximum cost efficiency to USB users with lower peripheral requirements. Like the 2070, this 3.3 V device enables maximum power savings with self-powered and bus-powered modes. It also integrates the same circuitry for easy interface to next-generation USB-based PCs.



Designing with USB devices such as the TUSB2040 and TUSB2070 makes PC expansion simple. One example of this is the reduction of cables needed to connect peripherals to the PC. Today, standard PCs allow only four or five peripherals, each with its own separate type of cable and connector. The USB standard enables up to 127 different peripherals to be simultaneously connected to a single PC. Another example is the simplicity of adding peripherals using USB's plug and play capability. With Plug and Play's hot insertion ability, users can add or remove any peripheral while the system is running, making expansion cards and complicated installation procedures a thing of the past.

Both these devices offer power saving features. For instance, all downstream ports have autodetect capability for full-speed and low-speed operations. Also, support for power switching and overcurrent reporting to downstream ports is provided per port or ganged.

Both the TUSB2070 and TUSB2040 are available in a 48-pin TQFP package. The TUSB2040 is also available in a 28-pin DIP.

Check box 14 for a datasheet.

Product Features

- Full Compliance to USB standard
- Integrated USB transceivers
- 3.3 V Operation
- Supports self-powered and bus powered mode
- Power dissipation of 33 mW
- Suspend mode power is 3.3 mW
- Characterized for operation from 0°C to 70°C

Texas Instruments is currently the only IC Manufacturersupplying a complete hub solution:

Current-limited power switches	TPS2014/15	$0.93
Transient suppressors	SN75240	$0.42
Low drop-out (LDO) regulators	TPS71xxQD	$1.20
	TPS72xxQD	$0.70
	TPS73xx QD	$1.52

Suggested resale price

Quoted per device in quantities of 1,000

TUSB2040N: $3.15

TUSB2040PT: $3.20

TUSB2070PT: $3.42

E V M K I T S

Each EVM kit contains a fully-assembled evaluation board, data sheet, and a User's Guide for the evaluation board. Some kits also include applications notes, plus necessary software, cables and connectors.

To order any of the EVM kits listed, please call our toll-free order desk number 1-800-477-8924 x 5800.

TLC320AD50	**16-bit sigma delta AIC**	**$75.00**
TLC320AD55	**16-bit sigma delta AIC**	**$75.00**
TLC320AD56	**16-bit sigma delta AIC**	**$75.00**
TPS9104	**Cellphone P/S with audio PAs**	**$50.00**
TPS6735	**5 V, 200 mA inverting dc-dc converter**	**$50.00**
TLC5510	**8-bit, 20 MSPS ADC**	**$50.00**
TLC5540	**8-bit, 40 MSPS ADC**	**$50.00**
TLC2543	**5 V, 12-bit ADC**	**$75.00**
TLV2543	**3 V, 12-bit ADC**	**$75.00**
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PC404-1402 (TSL1402)	**400 DPI linear array**	**$127.95**
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TSBKGPCILYNX	**TSB12LV31/TSB21LV03 peripheral kit**	**$1000.00**
TSBKPRPHRL	**Peripheral Card**	**$1000.00**
TUSBK4HUB	**4-Port stand-alone hub kit**	**$349.00**
TUSBK7HUB	**7-Port stand-alone hub kit**	**$399.00**

MIXED-SIGNAL & ANALOG

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