24-pin QFN package makes single-channel UART industry's smallest

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The manufacturer says...

Exar Introduces Industry's Smallest UART Packaging Solution

Fremont, Calif.—Exar Corp., a leading provider of high-performance, mixed-signal silicon solutions for the worldwide communications infrastructure, announced the industry's smallest form factor single-channel UART in a 24-pin QFN package. Ideal for space-constrained applications such as cellular phones, PDAs, digital cameras, global positioning systems, and other portable consumer products, the XR16L580 offers the smallest package dimensions, with a footprint of only 4mm x 4mm and a height of 0.9mm.

"Today, Exar delivered a critical differentiating feature to the market: the industry's smallest UART package option," said Levent Ozcolak, acting general manager, Interface Products Division. "Exar's new UART package option is significantly smaller than anything currently available and further demonstrates Exar's continuing focus on technology leadership. The XR16L580 is an ideal solution for portable consumer products that require increased functionality, performance and power savings in a smaller form factor."
Product Details

The XR16L580 is a 2.5V to 5V device with 5V tolerant inputs. The device features an industry standard 16C550 register set and enhanced features such as 16-byte Transmit (TX) and Receive (RX) FIFOs with selectable

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Communications is an important market for Exar, but it's also a key tool in helping to understand its customers needs. By constantly talking to its customers to learn what their requirements are, Exar recognized that designers are looking for smaller interfaces. Instead of making its UART family obsolete or moving to a new technology, the company decided that it would house its very popular, high-performance XR16L580 device in a smaller package.

The XR16L580 single-channel UART is now being offered in a 24-pin QFN—the industry's smallest form factor, according to Exar. It has a footprint of only 4-mm X 4-mm and a height of 0.9-mm compared with 5-mm X 5-mm X 0.9-mm of the 28-pin and 32-pin QFN devices, and 9-mm X 9-mm X 0.9-mm of the 48-pin TQFP.

"People are going to smaller areas and adding these features last minute can't afford putting a gigantic package like a 9-mm X 9-mm the older UART offerings used to be," said Rita Horner, strategic marketing manager, Exar. "They want it as small as possible."

The UART is ideal for space-constrained applications such as cell phones, PDAs, digital cameras, global positioning systems, and other portable consumer products.

Horner explained that in consumer applications, namely portable appliances, designers don't need to go off chip very much; therefore, they don't really use the 8-pin modem interface that the XR16L580 UART provides.

"They may need a partial interface because they are interfacing chip to chip. That's one of the reasons why we looked into providing solutions for them that minimizes the modem interface from a 48-pin or 32-pin to a 24-pin by eliminating a few pins."

The updated XR16L580 is a 2.25 to 5.5-V UART with 5-V tolerate inputs. It is pin-to-pin and software compatible to industry standard 16C450, 16C550, ST16C580, ST16C650A and XR16C850 UARTs. It has 16-bytes of TX and RX FIFOs and is capable of operating at serial data rates of up to 1-Mbits/s at 2.25-V supply. To support today's high-bandwidth communications needs, the XR16L580's internal registers are compatible with the register set of the 16C550.

The XR16L580 features a Motorola or Intel data bus interface to match the user's CPU interface. It also has automatic hardware and software flow control to prevent data loss, selectable RX and TX trigger levels for more efficient

trigger levels, automatic software flow control (Xon/Xoff), infrared (IrDA) encoder/decoder, and sleep mode. In addition, the device supports both Intel and Motorola 8-bit data bus interfaces. The device also integrates the Power-Save feature that further reduces the power consumption during sleep mode to less than 30uA at 5V.

"UART devices are the most commonly utilized interfaces due to their ease of integration without the need for major hardware and/or software modifications," said Rita Horner, strategic marketing manager, Interface Products Division. "In the consumer market, where demand for increased product functionality is constant, the XR16L580 in a 24-pin QFN package delivers a distinct and cost effective advantage, enabling customers to respond quickly to changes in overall market conditions by incorporating last minute features to their end products for a competitive edge."

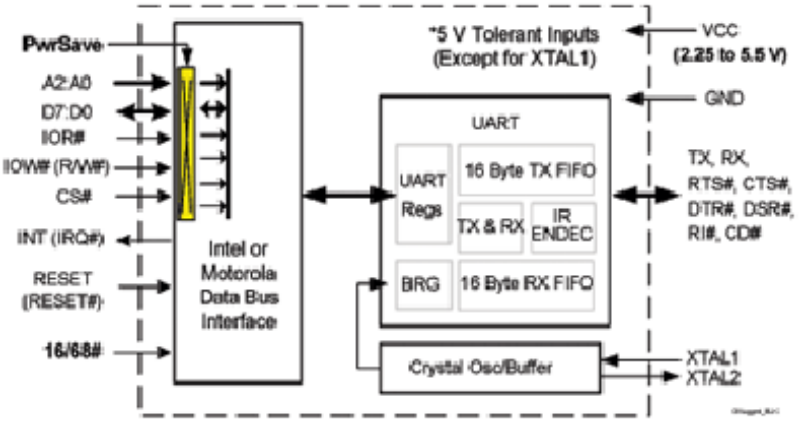
Tools and Support The XR16L580 is supported by Exar's market proven UART software drivers for popular real-time operating systems, such as Windows CE and VxWorks. With the availability of software drivers and Exar's application support line, UART customers can accelerate their time-to-market by eliminating driver development, testing and diagnostic procedures.

Packages and Availability The XR16L580 in a 24-pin QFN package is available now, as are the 28 and 32-pin (5mm x 5mm) QFN packages, and the 48-pin TQFP package. All these devices operate over the industrial temperature range of -40C to +85C. Additional information on the product can be found at URL www.exar.com/product.php?ProdNumber=XR16L580&areaID=3 and other UART Products at www.exar.com/area.php?areaID=3. All Exar products are in compliance with European RoHS requirements except for lead. Lead-free products are also available upon request.

About Exar Exar Corporation designs, develops and markets high-performance, analog and mixed-signal silicon solutions for the worldwide communications infrastructure. Leveraging its industry-proven analog design expertise, system-level knowledge and standard CMOS process technologies, the Company provides interrupt service, and wireless infrared (IrDA) encoder/decoder for wireless applications. A unique Power-Save mode helps to increase battery-operating time.

"The nice thing about the L580 product is the power save mode— we have two levels of power savings in our product: sleep mode and power-save feature. We have the lowest power in our part as a single channel," Horner said.

The sleep mode is generic; there is no activity in either direction, Horner explained. The UART stops the clock oscillator, which goes to sleep to conserve power, she said. The address lines, databus and control lines, however, are still active during sleep mode so that the internal registers of the device can be accessed. Signal activity could drain the UART's power. That's when the power-save mode kicks in.



"We have additional buffers at the input side of the CPU, which is the power side of the UART. These buffers allow you to have power savings by putting this in the power save mode," she said.

The power-save mode isolates the device from the databus interface. As a result, the power consumption is steady and in the range of 15 to 50 µA at 3.3V, or to less than 30µA at 5V. It isn't affected by any activity on the databus, address or control lines. The internal registers can't be approached while in this mode.

Using a 24-pin device vs. a 48- or 32-pin effectively gives the end-customer a total cost reduction, Horner explained.

"If they don't effectively use all eight of the serial modem interfaces, in order to be able to drive less power or to make their parts function much better, they have to terminate the inputs," Horner said. "You are terminating those inside the package, so the customer doesn't have to run all of those traces on the board to terminate their smaller areas on their boards, which increases their assembly yields. There are a lot of area savings. It's not just the package shrinking from a 9-mm X 9-mm to 4-mm X 4-mm, which can result in a 60 to 70% savings," Horner said.

To learn more about the smallest UART packaging solution, read the XR16L580's datasheet published in June 2005: www.exar.com/products/xr16l580-140-062805.pdf

In 10-K volumes, the 24-pin QFN XR16L580 costs less than $1.50 each.

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OEMs innovative, highly-integrated ICs that facilitate the transport and aggregation of signals in access, metro and wide area networks. The Company's physical layer silicon solutions address transmission standards such as T/E carrier, ATM and SONET. The Company also provides one of the industry's most comprehensive family of serial communications solutions. Within this product offering, the low voltage and multi-channel universal asynchronous receiver transmitters are particularly well suited to support high data rate and increasing data transfer efficiency requirements for various industrial, telecom and computer server applications. In addition, the Company offers a portfolio of clock generation and clock distribution devices for a wide range of communications systems. The Company is based in Fremont, CA, had fiscal 2005 revenues of $57.4 million, and employs approximately 265 people worldwide. For more information about the Company visit: http://www.exar.com.