

Advanced Notebook I/O for LPC Designs with Three Serial Ports

Product Features

- 3.3 Volt Operation (5 Volt Tolerant)
- PC99, PC01, ACPI 1.0 Compliant
- LPC Interface
 - Supports LPC Bus frequencies of 19.2MHz to 33MHz
- Serial IRQ Compatible with Serialized IRQ Support for PCI Systems
- Programmable Wake-up Event (PME) Interface
- 24 General Purpose Input/Output Pins
- System Management Interrupt
- Serial Ports
 - Three Full Function Serial Ports
 - High Speed NS16C550A Compatible UARTs with Send/Receive 16-Byte FIFOs
 - Supports 230k and 460k Baud
 - Programmable Baud Rate Generator
 - Modem Control Circuitry
 - 480 Address and 15 IRQ Options
- Infrared Communications Controller
 - IrDA v1.2 (4Mbps), HPSIR, ASKIR, Consumer IR Support
 - 2 IR Ports
 - 96 Base I/O Address, 15 IRQ, and 4 DMA Options
- Two LED Drivers with blinking options
- Watch Dog Timer with optional output pin
- 64-Pin QFN RoHS Compliant package

Description

The SIO1028 is a single chip LPC I/O device. The SIO1028 is a 3.3V operational (5.0V tolerant), PC 99/ 2001, and ACPI 1.0 compliant Super I/O Controller.

The SIO1028 includes 24 GPIO pins, support for two LED's with blinking option and a Watchdog Timer (WDT) with optional output pin. The SIO1028 includes three 16C550A compatible UARTs. One UART includes additional support for a Serial Infrared Interface that complies with IrDA v1.2 (Fast IR), HPSIR, and ASKIR formats, as well as Consumer IR.

TO OUR VALUED CUSTOMERS

It is our intention to provide our valued customers with the best documentation possible to ensure successful use of your Microchip products. To this end, we will continue to improve our publications to better suit your needs. Our publications will be refined and enhanced as new volumes and updates are introduced.

If you have any questions or comments regarding this publication, please contact the Marketing Communications Department via E-mail at docerrors@microchip.com. We welcome your feedback.

Most Current Data Sheet

To obtain the most up-to-date version of this data sheet, please register at our Worldwide Web site at:

http://www.microchip.com

You can determine the version of a data sheet by examining its literature number found on the bottom outside corner of any page. The last character of the literature number is the version number, (e.g., DS3000000A is version A of document DS30000000).

Errata

An errata sheet, describing minor operational differences from the data sheet and recommended workarounds, may exist for current devices. As device/documentation issues become known to us, we will publish an errata sheet. The errata will specify the revision of silicon and revision of document to which it applies.

To determine if an errata sheet exists for a particular device, please check with one of the following:

- Microchip's Worldwide Web site; http://www.microchip.com
- Your local Microchip sales office (see last page)

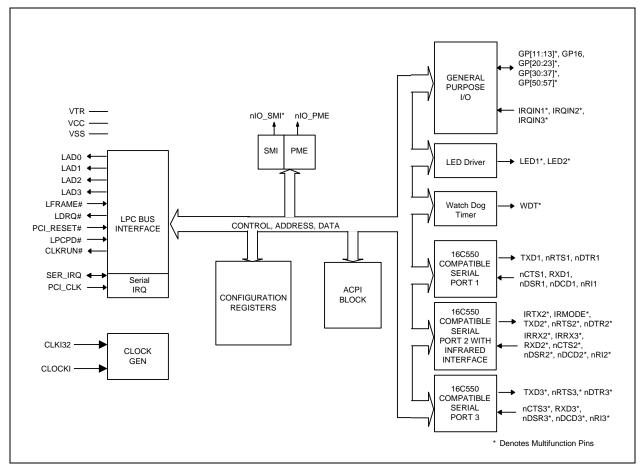
When contacting a sales office, please specify which device, revision of silicon and data sheet (include -literature number) you are using.

Customer Notification System

Register on our web site at www.microchip.com to receive the most current information on all of our products.

BLOCK DIAGRAM





PACKAGE OUTLINE

REVISION HISTORY	DATE RELEASED BY	3/7/08 S.K.ILEV	(DWG IS PRELIMINARY) 3/31/08 S.K.ILIEV	11/5/08	IOTES. 2/3/09 S.K.ILIEV			REMARK	OVERALL PACKAGE HEIGHT	STANDOFF	MOLD CAP THICKNESS	X/Y BODY SIZE	X/Y MOLD CAP SIZE	X/Y EXPOSED PAD SIZE	TERMINAL LENGTH	TERMINAL WIDTH	CENTER PAD TO PIN CLEARANCE	TERMINAL PITCH	NOTES 1. ALL DIMENSIONS ARE IN MILLIMETER, 2. DIMENSIONS ARE IN MILLIMETER, 2. DIMENSIONS ARE IN MILLIMETER, 3. DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL BUT MUST BE LOCATED WITHIN 3. DETAILS OF TERMINAL #1 IDENTIFIER MAY BE ETHER A MOLD OR MARKED FEATURE.	Note: For the most current package drawings, see the Microchip Packaging Specification at http://www.microchip.com/packaging	PACKAGE DATA 4704, 9x9mm BODY, 0.5mm PITCH,	4 7x4.7mm EXPOSED PAD, 0.4mm LEAD LENGTH Package Outline Drawing (POD)	64QFN-4704-9x9B C	PLANCE SHEET
REVISION	DESCRIPTION	NITIAL RELEASE (DW316 PRELIMINARY)	D2/E2 FROM 4 90±0 10 TO 4 70±0 10 (ows is PRELIMMARY)	INITIAL PRODUCTION RELEASE	ADDED PAGE 20/2. UPDATED APP NOTES.		COMMON DIMENSIONS	NOTE	-		-		•	~ ·	•	2	- CENT	•	TERMINALS AND I L. TIP ARE OPTIONAL BL #1 IDENTIFIER MA	Note: For th see the Mic http://www.i	64 PINS QFN-4	4.7x4.7mm EXF Packa	DWG NUMBER 64QF	SCALE STD COMPLIANCE
		ITIAL RELEAU	2/E2 FROM 4	ITIAL PRODU	DED PAGE		COMMOI	MAX	1.00	0.05	0.80	9.10	8.85	4.80	0.50	0.30	•		LLIMETER. 2 Plated : 6 Termina Dentifier Terminal		DATE	3/7/08	3/7/08	8
	REV	A N	A1 D:	8	C AI			MON	0.85	-	0.65	00.6	8.75	4.70		0.25	•	0.50 BSC	s ARE IN MI APPLIES T n FROM TH MINAL #1 IL ATED THE RE		NAME	DRAWN -	CHECKED -	APPROVED
								DL MIN	0.80	0	•	8.90	8.65	_	0.30	0.18	1.55		MENSIONS JISIONS "b" ND 0.30 mr LS OF TER LS OF TER REA INDIC ED FEATUI			Ĕ	5	
						≜ DENTIFIER AREA (DI2 X E/2) EXPOSED PAD 64X L		SYMBOL	۷	A1	A2	D/E	D1/E1	D2/E2	-	q	¥	Φ	NOTES. 1. ALL DI 2. DIMER 0.15 A 0.15 A 0.15 A THE A MARK	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLINETERS AND TOLERANCES ARE: DECIMAL XX ±01 ±1°	XXX #0.025 INTERPRET DIM AND TOL PER ASME Y14.5M - 1994			
							BOTTOM VIEW														دولولولولولولولولولولولولولولولولولولول			
				V		2 3 3 4 4 4 10 5 10 10 10 10 10 10 10 10 10 10					-					<u>^</u>					ل وروان رو	3-D VIEWS		

FIGURE 2: SIO1028 64-PIN QFN PACKAGE, 9 X 9MM BODY, 0.5MM PITCH

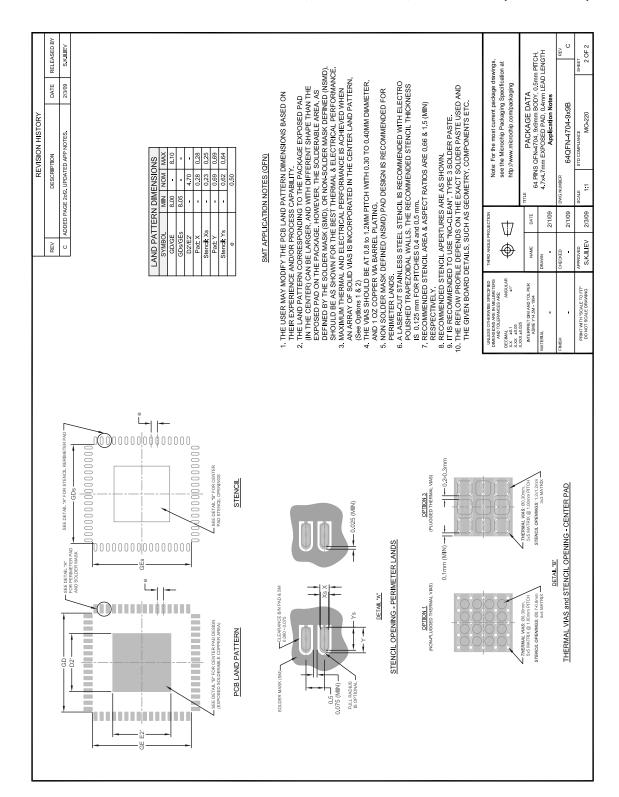


FIGURE 2: SIO1028 64-PIN QFN PACKAGE, 9 X 9MM BODY, 0.5MM PITCH (CONTINUED)

APPENDIX A: PRODUCT BRIEF REVISION HISTORY

TABLE A-1: REVISION HISTORY

Revision	Section/Figure/Entry	Correction				
DS00001818A (08-15-14)	Replaces previous SMSC version Rev. 0.5 (11-02-09)					

THE MICROCHIP WEB SITE

Microchip provides online support via our WWW site at www.microchip.com. This web site is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the web site contains the following information:

- **Product Support** Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- General Technical Support Frequently Asked Questions (FAQ), technical support requests, online discussion groups, Microchip consultant program member listing
- Business of Microchip Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

CUSTOMER CHANGE NOTIFICATION SERVICE

Microchip's customer notification service helps keep customers current on Microchip products. Subscribers will receive e-mail notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, access the Microchip web site at www.microchip.com. Under "Support", click on "Customer Change Notification" and follow the registration instructions.

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at: http://www.microchip.com/support

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, refer to the factory or the listed sales office.

PART NO. ⁽¹⁾ Device	- <u>XXX⁽²⁾ - [X]⁽³⁾</u> Package Tape and Reel Option	Examples: a) SIO1028-JZX = 64-pin QFN b) SIO1028-JZX-TR = 64-pin QFN Tape and Reel
Device:	SIO1028 ⁽¹⁾	Note 1: These products meet the halogen maximum concentration values per IEC61249-2-21.
Package: Tape and Reel Option:	JZX = 64-pin QFN ⁽²⁾ Blank = Tray packaging TR = Tape and Reel ⁽³⁾	Note 2: All package options are RoHS compliant. For RoHS compliance and environmental information, please visit <u>http://www.micro- chip.com/pagehandler/en-us/aboutus/ ehs.html</u> .
		Note 3: Tape and Reel identifier only appears in the catalog part number description. This identi- fier is used for ordering purposes and is not printed on the device package. Check with your Microchip Sales Office for package availability with the Tape and Reel option.

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

Trademarks

The Microchip name and logo, the Microchip logo, dsPIC, FlashFlex, flexPWR, JukeBlox, KEELoQ, KEELoQ logo, Kleer, LANCheck, MediaLB, MOST, MOST logo, MPLAB, OptoLyzer, PIC, PICSTART, PIC³² logo, RightTouch, SpyNIC, SST, SST Logo, SuperFlash and UNI/O are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

The Embedded Control Solutions Company and mTouch are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Analog-for-the-Digital Age, BodyCom, chipKIT, chipKIT logo, CodeGuard, dsPICDEM, dsPICDEM.net, ECAN, In-Circuit Serial Programming, ICSP, Inter-Chip Connectivity, KleerNet, KleerNet logo, MiWi, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PICkit, PICtail, RightTouch logo, REAL ICE, SQI, Serial Quad I/O, Total Endurance, TSHARC, USBCheck, VariSense, ViewSpan, WiperLock, Wireless DNA, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

Silicon Storage Technology is a registered trademark of Microchip Technology Inc. in other countries.

GestIC is a registered trademarks of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2009 - 2014, Microchip Technology Incorporated, Printed in the U.S.A., All Rights Reserved.

ISBN: 9781632765277

QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV = ISO/TS 16949=

Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, KEELoQ® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and mnufacture of development systems is ISO 9001:2000 certified.



Worldwide Sales and Service

AMERICAS

Corporate Office 2355 West Chandler Blvd. Chandler, AZ 85224-6199 Tel: 480-792-7200 Fax: 480-792-7277 Technical Support: http://www.microchip.com/ support

Web Address: www.microchip.com

Atlanta Duluth, GA Tel: 678-957-9614 Fax: 678-957-1455

Austin, TX Tel: 512-257-3370

Boston Westborough, MA Tel: 774-760-0087 Fax: 774-760-0088

Chicago Itasca, IL Tel: 630-285-0071 Fax: 630-285-0075

Cleveland Independence, OH Tel: 216-447-0464 Fax: 216-447-0643

Dallas Addison, TX Tel: 972-818-7423 Fax: 972-818-2924

Detroit Novi, MI Tel: 248-848-4000

Houston, TX Tel: 281-894-5983

Indianapolis Noblesville, IN Tel: 317-773-8323 Fax: 317-773-5453

Los Angeles Mission Viejo, CA Tel: 949-462-9523 Fax: 949-462-9608

New York, NY Tel: 631-435-6000

San Jose, CA Tel: 408-735-9110

Canada - Toronto Tel: 905-673-0699 Fax: 905-673-6509

ASIA/PACIFIC

Asia Pacific Office Suites 3707-14, 37th Floor Tower 6, The Gateway Harbour City, Kowloon Hong Kong Tel: 852-2943-5100 Fax: 852-2401-3431 Australia - Sydney

Tel: 61-2-9868-6733 Fax: 61-2-9868-6755

China - Beijing Tel: 86-10-8569-7000 Fax: 86-10-8528-2104

China - Chengdu Tel: 86-28-8665-5511 Fax: 86-28-8665-7889

China - Chongqing Tel: 86-23-8980-9588 Fax: 86-23-8980-9500

China - Hangzhou Tel: 86-571-8792-8115 Fax: 86-571-8792-8116

China - Hong Kong SAR Tel: 852-2943-5100

Fax: 852-2401-3431 China - Nanjing

Tel: 86-25-8473-2460 Fax: 86-25-8473-2470 China - Qingdao Tel: 86-532-8502-7355

Fax: 86-532-8502-7205 China - Shanghai Tel: 86-21-5407-5533

Tel: 86-21-5407-5533 Fax: 86-21-5407-5066

China - Shenyang Tel: 86-24-2334-2829 Fax: 86-24-2334-2393

China - Shenzhen Tel: 86-755-8864-2200 Fax: 86-755-8203-1760

China - Wuhan Tel: 86-27-5980-5300 Fax: 86-27-5980-5118

China - Xian Tel: 86-29-8833-7252 Fax: 86-29-8833-7256

China - Xiamen Tel: 86-592-2388138 Fax: 86-592-2388130

China - Zhuhai Tel: 86-756-3210040 Fax: 86-756-3210049

ASIA/PACIFIC

India - Bangalore Tel: 91-80-3090-4444 Fax: 91-80-3090-4123

India - New Delhi Tel: 91-11-4160-8631 Fax: 91-11-4160-8632

India - Pune Tel: 91-20-3019-1500

Japan - Osaka Tel: 81-6-6152-7160 Fax: 81-6-6152-9310

Japan - Tokyo Tel: 81-3-6880- 3770 Fax: 81-3-6880-3771

Korea - Daegu Tel: 82-53-744-4301 Fax: 82-53-744-4302

Korea - Seoul Tel: 82-2-554-7200 Fax: 82-2-558-5932 or 82-2-558-5934

Malaysia - Kuala Lumpur Tel: 60-3-6201-9857 Fax: 60-3-6201-9859

Malaysia - Penang Tel: 60-4-227-8870 Fax: 60-4-227-4068

Philippines - Manila Tel: 63-2-634-9065 Fax: 63-2-634-9069

Singapore Tel: 65-6334-8870 Fax: 65-6334-8850

Taiwan - Hsin Chu Tel: 886-3-5778-366 Fax: 886-3-5770-955

Taiwan - Kaohsiung Tel: 886-7-213-7830

Taiwan - Taipei Tel: 886-2-2508-8600 Fax: 886-2-2508-0102

Thailand - Bangkok Tel: 66-2-694-1351 Fax: 66-2-694-1350

EUROPE

Austria - Wels Tel: 43-7242-2244-39 Fax: 43-7242-2244-393 Denmark - Copenhagen Tel: 45-4450-2828

Fax: 45-4485-2829 France - Paris Tel: 33-1-69-53-63-20

Fax: 33-1-69-30-90-79 Germany - Dusseldorf

Tel: 49-2129-3766400 Germany - Munich

Tel: 49-89-627-144-0 Fax: 49-89-627-144-44

Germany - Pforzheim Tel: 49-7231-424750

Italy - Milan Tel: 39-0331-742611 Fax: 39-0331-466781

Italy - Venice Tel: 39-049-7625286

Netherlands - Drunen Tel: 31-416-690399 Fax: 31-416-690340

Poland - Warsaw Tel: 48-22-3325737

Spain - Madrid Tel: 34-91-708-08-90 Fax: 34-91-708-08-91

Sweden - Stockholm Tel: 46-8-5090-4654

UK - Wokingham Tel: 44-118-921-5800 Fax: 44-118-921-5820

03/25/14