

IT8705F/IT8705AF

Simple Low Pin Count Input / Output (Simple LPC I/O)

Preliminary Specification V0.4.1

(For G Version)

ITE TECH. INC.

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Please note that the IT8705F V0.4.1 is applicable to G version and future versions.

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1. Features

■ Low Pin Count Interface

- Compliant with Intel LPC Interface Specification Rev.1.0 (Sept. 29, 1997)
- Supports Serial IRQ Protocol
- Supports PCI PME# Interface

■ PC98/PC99, ACPI Compliant

- PC98 & PC99 compliant
- Register sets compatible with "Plug and Play ISA Specification Rev. 1.0a"
- ACPI V. 1.0 compliant
- Supports 9 logical devices

■ Enhanced Hardware Monitor

- Built-in 8-bit Analog to Digital Converter
- 3 thermal inputs from remote thermistors or thermal diode or diode-connected transistor
- 8 voltage monitor inputs (VBAT is measured internally.)
- Watch Dog comparison of all monitored values

■ Fan Speed Controller

- Provides Fan ON/OFF and PWM control
- 3 programmable Pulse Width Modulation (PWM) Fan control outputs
- Each PWM output supports 128 steps of PWM modes
- Monitors 3 Fan tachometer inputs

■ Game Port

- Built-in 558 quad timers and buffer chips
- Supports direct connection of two joysticks
- Game port signals are multiplexed with GPIOs

■ Two 16C550 UARTs

- Supports two standard Serial ports
- UART1 is dedicated for Serial port
- UART2 supports either Serial Port or IrDA 1.0/ASKIR

■ MIDI Interface

- UART implementation
- Supports direct connection to MPU-401 MIDI

■ Consumer Remote Control (TV remote) IR with Power-up Feature

■ IEEE 1284 Parallel Port

- Standard mode -- Bi-directional SPP compliant
- Enhanced mode -- EPP V.1.7 and 1.9 compliant
- High speed mode -- ECP, IEEE 1284 compliant
- Backdrive current reduction
- Printer power-on damage reduction
- Supports POST (Power-On Self Test) Data Port

■ Floppy Disk Controller

- Supports two 360K/ 720K/ 1.2M/ 1.44M/ 2.88M floppy disk drives
- Enhanced digital data separator
- 3-Mode drives supported
- Supports automatic write protection via software

■ Smart Card Reader

- Compliant with Personal Computer Smart Card (PC/SC) Working Group standard
- Compliant with smart card (ISO 7816) protocols
- Supports card present detect
- Supports one programmable clock frequency, 7.1 MHz, and 3.5 MHz (default) card clocks

■ 48 General Purpose I/O Pins

- Input mode supports switch de-bounce
- SMI is routed through GPIOs
- Power LED Blinking Control
- Hardware Monitor Warning Beep Output
- External IRQ Inputs Routing into Serial IRQ
- Watch Dog Timer

■ Flash ROM Interface

- Up to 8M bits flash supported

■ Single 24/48 MHz Clock Inputs

■ Only for IT8705AF

- 1 chassis open detection input with low power Flip-Flop backed by the battery

■ 128-Pin QFP

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2. General Description

The IT8705F is a LPC Interface based highly integrated Super I/O. The IT8705F provides the most commonly used legacy Super I/O functionality plus the latest Environment Control initiatives, such as Hardware Monitor, Fan Speed Controller and ITE's "SmartGuardian" function. The device's LPC interface complies with Intel "LPC Interface Specification Rev. 1.0" (Sept. 29, 1997). The IT8705F meets the "Microsoft® PC98 & PC99 System Design Guide" requirements and is ACPI compliant.

The IT8705F features the enhanced hardware monitor providing 3 thermal inputs from remote thermistors, thermal diode or diode-connected transistor (2N3904). The device also provides the ITE innovative intelligent automatic Fan ON/OFF & speed control functions (SmartGuardian) to reduce overall system noise and power consumption. It also features a PC/SC and ISO 7816 compliant Smart Card Reader.

The IT8705F has integrated nine logical devices, featuring an Environment Controller (controls three Fans). The Environment Controller has temperature, voltage and Fan Speed monitors. One Fan Speed Controller is responsible to control three fan speeds through three 128 steps of Pulse Width Modulation (PWM) output pins and to monitor three fans' tachometer inputs.

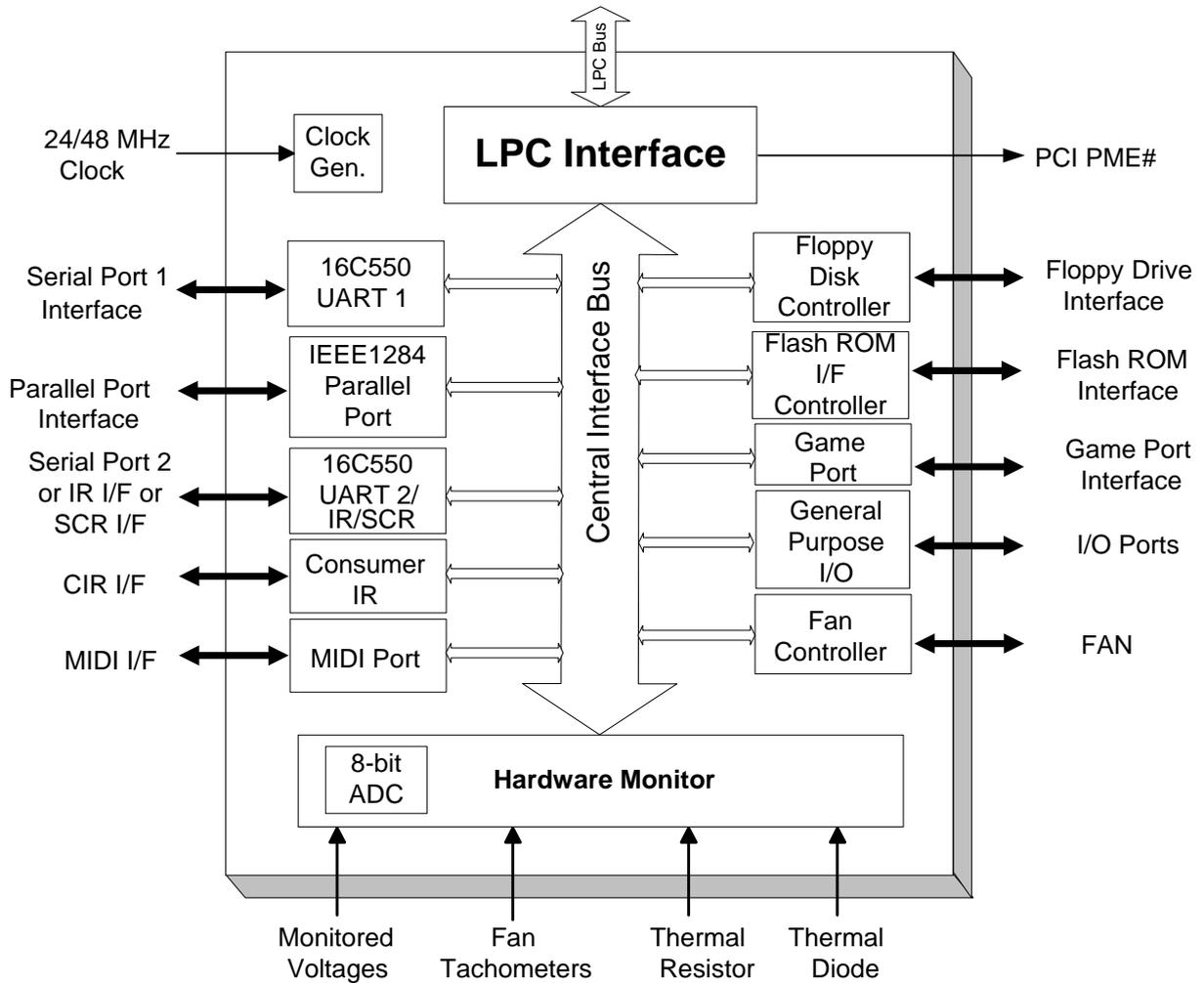
Other features include one high-performance 2.88MB floppy disk controller, with digital data separator, supporting two 360K/ 720K/ 1.2M/ 1.44M/ 2.88M floppy disk drives. One multi-mode high-performance parallel port features the bi-directional Standard Parallel Port (SPP), the Enhanced Parallel Port (EPP V. 1.7 and EPP V. 1.9 are supported), and the IEEE 1284 compliant Extended Capabilities Port (ECP). Two 16C550 standard compatible enhanced UARTs perform asynchronous communication, and support SIR and one consumer remote control (TV remote) IR, one MPU-401 UART mode compatible MIDI port, one game port with built-in 558 quad timers and buffer chips to support direct connection of 2 joysticks, and six ports (44 GPIO pins). There is also a flash ROM interface with Address (FA[0:19]), Data (FD[0:7]), and supporting three control signals FCS#, FWE# and FRD#. In addition, a SmartGuardian engine is provided to monitor the system condition and reacts to the detected condition accordingly.

These nine logical devices can be individually enabled or disabled via software configuration registers. The IT8705F utilizes power-efficient circuitry to reduce power consumption. Once a logical device is disabled, the inputs are gated inhibit, the outputs are TRI-STATE and the input clock is disabled. The IT8705F requires a single 48/24 MHz clock input and operates with a single +5V power supply.

The IT8705F is available in 128-pin PQFP (Plastic Quad Flat Package).

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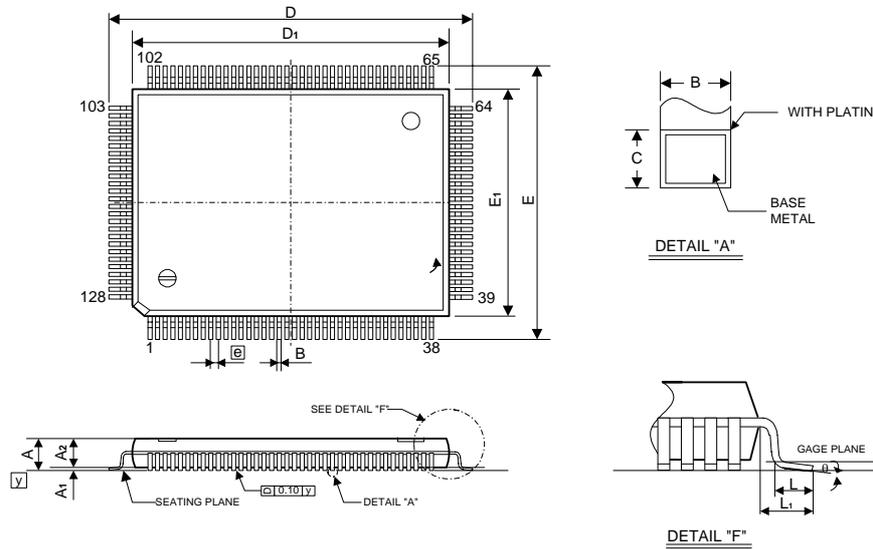
3. Block Diagram



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4. Package Information
QFP 128L Outline Dimensions

unit: inches/mm



| Symbol | Dimension in Inch | | | Dimension in mm | | |
|----------------|-------------------|-------|-------|-----------------|-------|-------|
| | Min. | Nom. | Max. | Min. | Nom. | Max. |
| A | - | - | 0.134 | - | - | 3.40 |
| A ₁ | 0.010 | - | - | 0.25 | - | - |
| A ₂ | 0.107 | 0.112 | 0.117 | 2.73 | 2.85 | 2.97 |
| B | 0.007 | 0.009 | 0.011 | 0.17 | 0.22 | 0.27 |
| C | 0.004 | - | 0.008 | 0.09 | - | 0.20 |
| D | 0.906 | 0.913 | 0.921 | 23.00 | 23.20 | 23.40 |
| D ₁ | 0.783 | 0.787 | 0.791 | 19.90 | 20.00 | 20.10 |
| E | 0.669 | 0.677 | 0.685 | 17.00 | 17.20 | 17.40 |
| E ₁ | 0.547 | 0.551 | 0.555 | 13.90 | 14.00 | 14.10 |
| \square | 0.020 BSC | | | 0.5 BSC | | |
| L | 0.029 | 0.035 | 0.041 | 0.73 | 0.88 | 1.03 |
| L ₁ | 0.063 BSC | | | 1.60 BSC | | |
| y | - | - | 0.004 | - | - | 0.10 |
| θ | 0° | - | 7° | 0° | - | 7° |

Notes:

1. DIMENSIONS D₁ AND E₁ DO NOT INCLUDE MOLD PROTRUSION. BUT MOLD MISMATCH IS INCLUDED.
2. DIMENSIONS B DOES NOT INCLUDE DAMBAR PROTRUSION.
3. CONTROLLING DIMENSION: MILLIMETER.

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5. Ordering Information

| Part No. | Package |
|-----------------|----------------|
| IT8705F | 128 QFP |

ITE also provides lead-free component. Please mark " -L " at the end of the Part No. when the parts ordered are lead-free.

ITE TECH. INC. TERMS AND CONDITIONS OF SALE (Rev: 2005)

0. PARTIES

ITE Tech. Inc. ("Seller") is a company headquartered in Taiwan, Republic of China, and incorporated under laws of Republic of China. Buyer is a company or an entity, purchasing product from ITE Tech. Inc.

1. ACCEPTANCE OF TERMS

BUYER ACCEPTS THESE TERMS (i) BY WRITTEN ACCEPTANCE (BY PURCHASE ORDER OR OTHERWISE), OR (ii) BY FAILURE TO RETURN GOODS DESCRIBED ON THE FACE OF THE PACKING LIST WITHIN FIVE DAYS OF THEIR DELIVERY.

2. DELIVERY

- (a) Delivery will be made Free Carrier (Incoterms), Seller's warehouse, Science-Based Industrial Park, Hsinchu, Taiwan.
- (b) Title to the goods and the entire risk will pass to Buyer upon delivery to carrier.
- (c) Shipments are subject to availability. Seller shall make every reasonable effort to meet the date(s) quoted or acknowledged, and if Seller makes such effort, Seller will not be liable for any delays.

3. TERMS OF PAYMENT

- (a) Terms are as stated on Seller's quotation, or if none are stated, net thirty (30) days. Accounts past due will incur a monthly charge at the rate of one percent (1%) per month (or, if less, the maximum allowed by applicable law) to cover servicing costs.
- (b) Seller reserves the right to change credit terms at any time in its sole discretion.

4. LIMITED WARRANTY

- (a) Seller warrants that the goods sold will be free from defects in material and workmanship and comply with Seller's applicable published specifications for a period of ninety (90) days from the date of Seller's delivery. Within the warranty period and by obtaining a return number from Seller, Buyer may request replacement or repair for defective goods.
- (b) Goods or parts which have been subject to abuse (including without limitation repeated or extended exposure to conditions at or near the limits of applicable absolute ratings) misuse, accident, alteration, neglect, or unauthorized repair or improper application are not covered by any warranty. No warranty is made with respect to custom products or goods produced to Buyer's specifications (unless specifically stated in a writing signed by Seller).
- (c) No warranty is made with respect to goods used in devices intended for use in applications where failure to perform when properly used can reasonably be expected to result in significant injury (including, without limitation, navigation, aviation or nuclear equipment, or for surgical implant or to support or sustain life) and Buyer agrees to indemnify, defend, and hold harmless Seller from all claims, damages and liabilities arising out of any such uses.
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- (f) EXCEPT AS PROVIDED ABOVE, SELLER MAKES NO WARRANTIES OR CONDITIONS, EXPRESS, IMPLIED, OR STATUTORY; AND SELLER EXPRESSLY EXCLUDES AND DISCLAIMS ANY WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OR APPLICATION.

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- (d) AS A SEPARATE LIMITATION, IN NO EVENT WILL SELLER BE LIABLE FOR COSTS OF SUBSTITUTE GOODS; FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL OR INDIRECT DAMAGES; OR LOSS OF USE, OPPORTUNITY, MARKET POTENTIAL, AND/OR PROFIT ON ANY THEORY (CONTRACT, TORT, FROM THIRD PARTY CLAIMS OR OTHERWISE). THESE LIMITATIONS SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY REMEDY.
- (e) No action against Seller, whether for breach, indemnification, contribution or otherwise, shall be commenced more than one year after the cause of action has accrued, or more than one year after either the Buyer, user or other person knew or with reasonable diligence should have known of the matter or of any claim of dissatisfaction or defect involved; and no such claim may be brought unless Seller has first been given commercially reasonable notice, a full written explanation of all pertinent details, and a good faith opportunity to resolve the matter.
- (f) BUYER EXPRESSLY AGREES TO THE LIMITATIONS OF THIS PARAGRAPH 5 AND TO THEIR REASONABLENESS.

6. SUBSTITUTIONS AND MODIFICATIONS

Seller may at any time make substitutions for product ordered which do not materially and adversely affect overall performance with the then current specifications in the typical and intended use. Seller reserves the right to halt deliveries and shipments and alter specifications and prices without notice. Buyer shall verify that the literature and information is current before purchasing.

7. CANCELLATION

The purchase contract may not be canceled by Buyer except with written consent by Seller and Buyer's payment of reasonable cancellation charges (including but not be limited to expenses already incurred for labor and material, overhead, commitments made by Seller, and a reasonable profit).

8. INDEMNIFICATION

Seller will, at its own expense, assist Buyer with technical support and information in connection with any claim that any parts as shipped by Seller under the purchase order infringe any valid and enforceable copyright, or trademark, provided however, that Buyer (i) gives immediate written notice to Seller, (ii) permits Seller to participate and to defend if Seller requests to do so, and (iii) gives Seller all needed information, assistance and authority. However, Seller will not be responsible for infringements resulting from anything not entirely manufactured by Seller, or from any combination with products, equipment, or materials not furnished by Seller. Seller will have no liability with respect to intellectual property matters arising out of products made to Buyer's specifications, code, or designs. Except as expressly stated in this Paragraph 8 or in another writing signed by an authorized officer, Seller makes no representations and/or warranties with respect to intellectual and/or industrial property and/or with respect to claims of infringement. Except as to claims Seller agrees in writing to defend, BUYER WILL INDEMNIFY, DEFEND AND HOLD HARMLESS SELLER FROM ALL CLAIMS, COSTS, LOSSES AND DAMAGES (INCLUDING ATTORNEY'S FEES) AGAINST AND/OR ARISING OUT OF GOODS SOLD AND/OR SHIPPED HEREUNDER.

9. NO CONFIDENTIAL INFORMATION

Seller shall have no obligation to hold any information in confidence except as provided in a separate non-disclosure agreement signed by both parties.

10. ENTIRE AGREEMENT

- (a) These terms and conditions are the entire agreement and the only representations and understandings between Seller and Buyer, and no addition, deletion or modification shall be binding on Seller unless expressly agreed to in written and signed by an officer of Seller.
- (b) Buyer is not relying upon any warranty or representation except for those specifically stated here.

11. APPLICABLE LAW

The contract and all performance and disputes arising out of or relating to goods involved will be governed by the laws of R.O.C. (Taiwan, Republic of China), without reference to the U.N. Convention on Contracts for the International Sale of Goods or to conflict of laws principles. Buyer agrees at its sole expense to comply with all applicable laws in connection with the purchase, use or sale of the goods provided hereunder and to indemnify Seller from any failure by Buyer to so comply. Without limiting the foregoing, Buyer certifies that no technical data or direct products thereof will be made available or re-exported, directly or indirectly, to any country to which such export or access is prohibited or restricted under R.O.C. laws or U.S. laws or regulations, unless prior authorization is obtained from the appropriate officials and agencies of the government as required under R.O.C. or U.S. laws or regulations.

12. JURISDICTION AND VENUE

The courts located in Hsinchu, Taiwan, Republic of China, will have the sole and exclusive jurisdiction and venue over any dispute arising out of or relating to the contract or any sale of goods hereunder. Buyer hereby consents to the jurisdiction of such courts.

13. ATTORNEYS' FEES

Reasonable attorneys' fees and costs will be awarded to the prevailing party in the event of litigation involving and/or relating to the enforcement or interpretation of the contract and/or any goods sold under it.