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## Desktop Embedded Controller with Fan Control, Hardware Monitoring and PECI

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### Product Features

- High Performance Embedded Controller (EC)
- ACPI 2.0 Compliant
- PC2001 Compliant
- LPC Interface
  - Supports LPC Bus frequencies of 19MHz to 33MHz
  - Multiplexed Command, Address and Data Bus
  - Serial IRQ Interface Compatible with Serialized IRQ Support for PCI Systems
  - PME Interface
- Operating Temperature Range of 0°C to +70°C
- 3.3-Volt I/O
- 100-pin TQFP RoHS Compliant Package
- System Watch Dog Timer (WDT)
- Battery Backed Resources
  - Power-Fail Status Register
  - VBat backed 64 byte memory
- Two EC-based SMBus 2.0 Host Controllers
  - Allows Master or Dual Slave Operation
  - Controllers are Fully Operational on Standby Power
  - DMA-driven I<sup>2</sup>C Network Layer
  - I<sup>2</sup>C Datalink Compatibility Mode
  - Multi-Master Capable
  - Supports Clock Stretching
  - Programmable Bus Speeds
  - 400 KHz Capable
  - Hardware Bus Access “Fairness” Interface
  - Detects SMBus Time-outs
  - One controller can be multiplexed onto a low voltage SMBus
- PECI Interface 2.0
  - Supports PECI REQUEST# and PECI READY signaling
- Temperature reading from PCH over SMBus
- Temperature reading from AMD-TSI over SMBus
- Temperature Monitor
  - Monitoring up to 2 Remote Thermal Diodes plus an Anti-Parallel Remote Thermal Diode
- Built-in ADC supports temperature readings from -63 degrees Celsius to +192 degrees Celsius
  - Supports monitoring of discrete diodes (3904 type diodes)
  - Supports monitoring substrate diodes (45nm & 65nm processor diodes)
- Temperature resolution is 0.125 degrees Celsius
- Internal Ambient Temperature Measurement
- Out-of-limit Temperature Event reporting
- Bi-directional PROCHOT# Pin
  - Interrupt generation for PROCHOT Assert events
  - May be used by AMTA and PTTA features to adjust fan control limits
  - May be configured to force fans on full
  - Supports PROCHOT Assertions to external CPU
  - Supports PROCHOT Throttle Events to external CPU
  - Supports Interrupt Event to Host
- PWM (Pulse width Modulation) Outputs (3)
  - Multiple Clock Rates
  - 16-bit ON and 16-bit OFF Counters
- Fan tachometer Inputs (4)
  - Programmable to monitor standard tachometer outputs or locked rotor alarm outputs
  - Generate tachometer event when speed of fan drops below programmed limit
- Internal clock sources
  - A Ring Oscillator generates 64 MHz clock
  - SIO clocks derived from a 96MHz PLL synchronized to a 14.318MHz clock input
  - Main ring generates 32kHz standby clock when external 32.768KHz clock source is off
- Low Battery Warning
- Programmable Wake-up Event Interface
- General Purpose Input/Output Pins (45 total)
- System Management Interrupt (SMI)
- GLUE Logic
  - 2 Buffered PCI Reset Outputs
  - Power OK Signal Generation

# SCH5620

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- Power Sequencing
- Power Supply Turn On Circuitry
- Resume Reset Signal Generation
- Speaker output
- Keyboard Controller
  - 8042 Software Compatible
  - 8 Bit Microcomputer
  - 2k Bytes of Program ROM
  - 256 Bytes of Data RAM
  - Four Open Drain Outputs Dedicated for Keyboard/Mouse Interface
  - Asynchronous Access to Two Data Registers and One Status Register
  - Supports Interrupt and Polling Access
  - 8 Bit Counter Timer
  - Port 92 Support
  - Fast Gate A20 and KRESET Outputs
- Serial Port
  - One Full Function Serial Port
  - High Speed NS16C550A Compatible UART with Send/Receive 16-Byte FIFOs
  - Programmable Baud Rate Generator
  - Modem Control Circuitry
  - Any LPC Address Configurable. 15 IRQ Options

## General Description

The SCH5620 is a 3.3V PC 2001 compliant Super I/O controller with an LPC interface. All legacy drivers used for Super I/O components are supported making this interface transparent to the supporting software. The LPC bus also supports power management, such as wake-up and sleep modes.

The SCH5620 provides temperature monitoring with auto fan control. The temperature monitor is capable of monitoring up to three external diodes, one internal ambient temperature sensor or retrieving temperatures from external processors that implement the PECI

Interface. This device offers programmable automatic fan control support based on one or more of these measured temperatures. There are three pulse width modulation (PWM) outputs with high frequency support as well as four fan tachometer inputs. In addition, there is support for a bi-directional PROCHOT# pin that may be used to generate an interrupt, adjust the programmed temperature limits in the auto fan control logic, or force the PWM outputs on full. The RRCC feature provides a linear relationship of temperature to fan speed.

The Glue Logic includes various power management logic; including generation of RSMRST# and Power OK signal generation. The part also provides a low battery warning circuit.

The SCH5620 provides 45 General Purpose I/O control pins, which offer flexibility to the system designer.

The SCH5620 incorporates the following Super I/O components: one serial port that is 16C550A UART compatible; and a keyboard/mouse controller that uses an 8042 micro controller.

The SCH5620 is ACPI 1.0b/2.0 compatible and supports multiple low power-down modes. It incorporates sophisticated power control circuitry (PCC), which includes keyboard and mouse wake-up events.

The SCH5620 incorporates a high-performance embedded microcontroller. The SCH5620 communicates with the system host using the Intel® Low Pin Count bus.

The SCH5620 is directly powered by two separate suspend supply planes (VBAT and VTR) and senses a third runtime power plane (VCC) to provide “instant on” and system power management functions. The SCH5620 also contains an integrated VTR Reset Generator and a system power management interface that supports low-power states and can drive state changes as a result of hardware wake events as defined by the SCH5620 wake interface.

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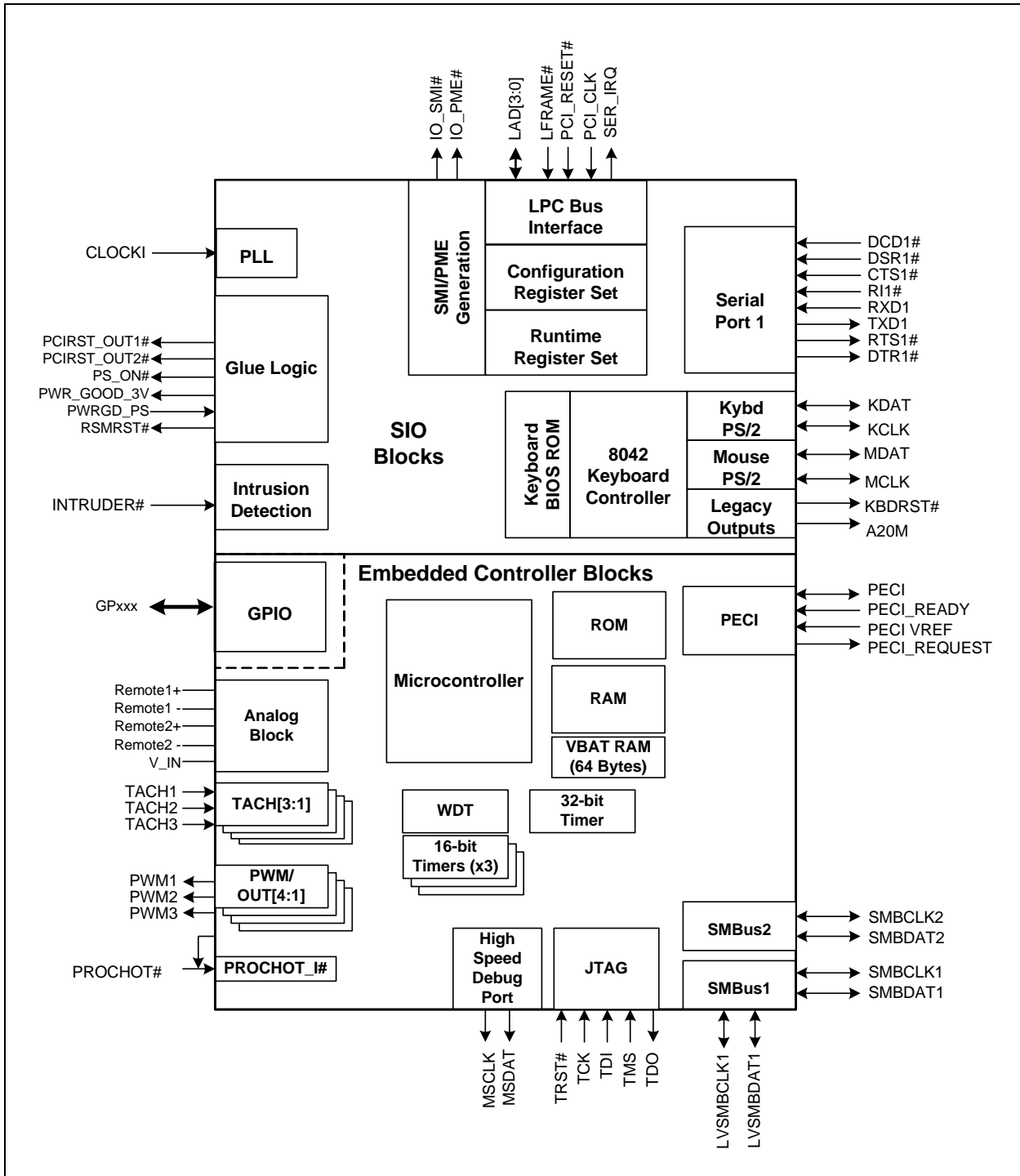
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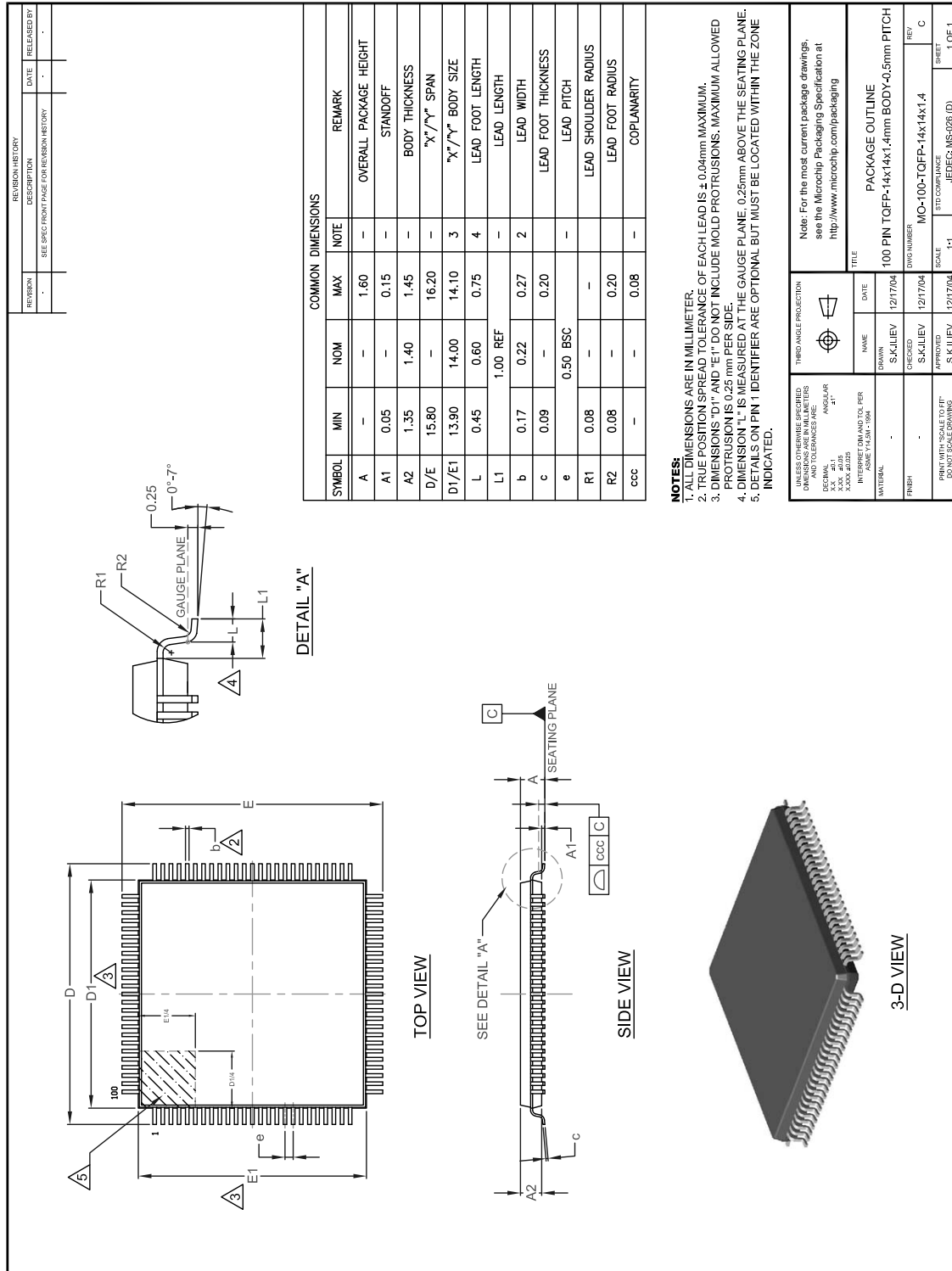
## BLOCK DIAGRAM

FIGURE 1: SCH5620 BLOCK DIAGRAM



## PACKAGE OUTLINE

FIGURE 2: 100-PIN TQFP, 14MM X 14MM X 1.4MM BODY, 0.5MM PITCH



# SCH5620

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## APPENDIX A: PRODUCT BRIEF REVISION HISTORY

TABLE A-1: REVISION HISTORY

Revision	Section/Figure/Entry	Correction
DS00001790A (07-08-14)	REV A replaces previous SMSC version Rev. 0.30 (01-25-10)	

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# SCH5620

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<u>PART NO.</u> <sup>(1)</sup>	-	<u>XXX</u> <sup>(2)</sup>	-	<u>IXI</u> <sup>(3)</sup>
Device		Package		Tape and Reel Option
Device:		SCH5620 <sup>(1)</sup>		
Package:		MT = 100-pin TQFP <sup>(2)</sup> RoHS Compliant package		
Tape and Reel Option:		Blank = Tray packaging		
		TR = Tape and Reel <sup>(3)</sup>		

**Example:**  
SCH5620-MT = 100-pin TQFP

**Note 1:** These products meet the halogen maximum concentration values per IEC61249-2-21.

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ISBN: 9781632763402

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