PCM-9593

Intel Core i7/i5/Celeron 5.25" SBC with VGA/LVDS/DVI/HDMI/2Mini PCIe/3 SATA
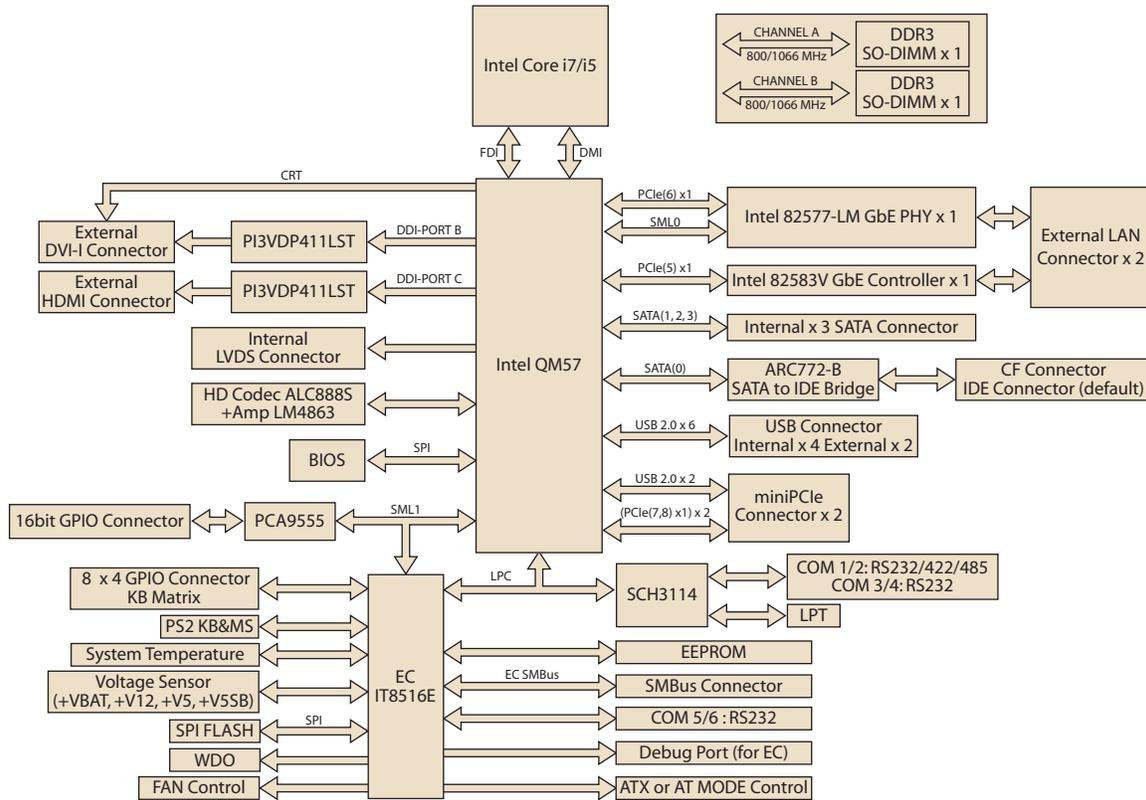
Preliminary

Features

- Supports Intel Core i7 and i5 mobile processor (BGA) with Intel QM57 chipset
- Supports wide range DC power supply from 9 ~ 32V
- Supports a variety of display devices of VGA, DVI, HDMI, and LVDS
- 2 Giga LAN, 2 Mini PCIe, 3 SATA
- Supports embedded software APIs and Utilities

Software APIs: Watchdog | I²C | GPIO | H/W Monitor | Brightness | Backlight On/Off

Utility: BIOS flash | eSOS | Monitoring | Flash Lock | Embedded Security ID

Windows Embedded | Linux | QNX

CE FCC

Specifications

Processor System	CPU	Intel Core i7 (LV)	Intel Core i7 (ULV)
	Max. Speed	2.0 GHz	1.06 GHz
	L2 Cache	4 MB	4 MB
	Chipset	QM57	
	BIOS	AMI 64 Mbit	
Memory	Technology	DDR3 800/1066	
	Max. Capacity	8 GB	
	Socket	2 x SO-DIMM	
SSD	CompactFlash	Card Type I, Type II	
I/O Interface	LPT	1	
	RS-232	4	
	RS-232/422/485	2 (Default RS-422/485, RS-232 by optional request)	
	PS2 K/B	1	
	PS2 Mouse	1	
	USB	6 x USB 2.0	
	Audio	HD Audio, ALC888 Codec, Line-in, Line-out, Mic-in	
	GPIO	16-bit GPIO	
	IrDA	115kbps (optional by request) shared from COM2	
SATA	Max. Data Transfer Rate	300 MB/s	
	Channel	3	
EIDE	Mode	-	
	Channel	-	
Expansion Slot	PCI/104-Plus	-	
	PCI slot	-	
	Mini-PCIe	2	
Ethernet	Speed	10/100/1000 Mbps	
	Controller	Intel 82577-LM, 82583V	
	Interface	2 x RJ45 connector	
Display	Controller	Integrated Gfx Gen5.75 with shared VGA memory TBD MB, supports DirectX 10 and OpenGL 2.1	
	LVDS	Single channel 18/24-bit/ dual channel 36/48-bit LVDS, max. resolution 1920 x 1200	
	DVI	Up to 1920 x 1200 resolution	
	HDMI	Up to 1920 x 1200 resolution	
	VGA	Up to 2048 x 1536 resolution	
	Dual Independent Display	Support 2 simultaneous displays	
Environment	Operating Temperature	0 ~ 60° C (32 ~ 140° F)	
	Operating Humidity	95% @ 60° C Relative Humidity	
Power	Power Type	AT/ ATX mode	
	Power Supply Voltage	9 V ~ 32 V (± 10%) wide range input	
	Power Consumption Typical (XP)		
	Power Consumption Max, Test in HCT		
	Power Management	APM, ACPI	
	Battery	Lithium 3 V/196 mAH	
Watchdog Timer	Output	System reset	
	Interval	Programmable 1 ~ 255 sec	
Physical Characteristics	Dimensions (L x W)	203 x 146 mm (8" x 5.75")	
	Weight	0.85 kg (1.87 lb) (with Heatsink)	

Board Diagram

Intel Core i7/i5

CHANNEL A
800/1066 MHz → DDR3 SO-DIMM x 1

CHANNEL B
800/1066 MHz → DDR3 SO-DIMM x 1

FDI | DMI

CRT

External DVI-I Connector ← PI3VDP411LST ← DDI-PORT B

External HDMI Connector ← PI3VDP411LST ← DDI-PORT C

Internal LVDS Connector

HD Codec ALC888S +Amp LM4863

BIOS — SPI

16bit GPIO Connector ↔ PCA9555 — SML1

Intel QM57

PCIe(6) x1 | Intel 82577-LM GbE PHY x 1 → External LAN Connector x 2
SML0

PCIe(5) x1 | Intel 82583V GbE Controller x 1

SATA(1, 2, 3) | Internal x 3 SATA Connector

SATA(0) | ARC772-B SATA to IDE Bridge ↔ CF Connector IDE Connector (default)

USB 2.0 x 6 | USB Connector Internal x 4 External x 2

USB 2.0 x 2
(PCIe(7,8) x1) x 2 | miniPCIe Connector x 2

LPC

8 x 4 GPIO Connector KB Matrix
PS2 KB&MS
System Temperature
Voltage Sensor (+VBAT, +V12, +V5, +V5SB)
SPI FLASH — SPI
WDO
FAN Control

EC IT8516E

SCH3114 | COM 1/2: RS232/422/485 COM 3/4: RS232
| LPT

EC SMBus
EEPROM
SMBus Connector
COM 5/6 : RS232
Debug Port (for EC)
ATX or AT MODE Control

Ordering Information

PN	CPU	CRT	LVDS	DVI	HDMI	LAN	Audio	USB 2.0	RS-232	RS-422/485	Expansion	Thermal
PCM-9593FG-U0A1E	LV: 2.0 GHz	Yes	Yes	Yes	Yes	2 GE	HD	6	4	2	2 x Mini-PCIe	Active
PCM-9593FG-S0A1E	ULV: 1.06 GHz	Yes	Yes	Yes	Yes	2 GE	HD	6	4	2	2 x Mini-PCIe	Active

Optional Accessories

Part No.	Description
PCM-10586-9593E	Wiring kit for PCM-9593
1703100260	USB cable

Packing List

Part No.	Description	Quantity
	PCM-9593 SBC	1
	Startup Manual	1
	Utility CD	1

Rear I/O

Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. Provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

Software APIs

Control

GPIO

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off a device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus

SMBus is the System Management Bus defined by Intel® Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

I²C

I²C is a bi-directional two wire bus that was developed by Philips for use in their televisions in the 1980s.
The I²C API allows a developer to interface with an embedded system environment and transfer serial messages using the I²C protocols, allowing multiple simultaneous device control.

Display

Brightness Control

The Brightness Control API allows a developer to interface with an embedded device to easily control brightness.

Backlight

The Backlight API allows a developer to control the backlight (screen) on/off in an embedded device.

Monitor

Watchdog

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own.
A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

Hardware Monitor

The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

Hardware Control

The Hardware Control API allows developers to set the PWM (Pulse Width Modulation) value to adjust fan speed or other devices; it can also be used to adjust the LCD brightness.

Power Saving

CPU Speed

Make use of Intel SpeedStep technology to reduce power power consumption. The system will automatically adjust the CPU Speed depending on system loading.

System Throttling

Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. These APIs allow the user to lower the clock from 87.5% to 12.5%.

Software Utilities

BIOS Flash

The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up current BIOS by copying it from the flash chip to a file on customers' disk. The BIOS Flash utility also provides a command line version and API for fast implementation into customized applications.

Embedded Security ID

The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge and innovation, but it is easily copied! The Embedded Security ID utility provides reliable security functions for customers to secure their application data within embedded BIOS.

Monitoring

The Monitoring utility allows the customer to monitor system health, including voltage, CPU and system temperature and fan speed. These items are important to a device; if critical errors happen and are not solved immediately, permanent damage may be caused.

eSOS

The eSOS is a small OS stored in BIOS ROM. It will boot up in case of a main OS crash. It will diagnose the hardware status, and then send an e-mail to a designated administrator. The eSOS also provides remote connection: Telnet server and FTP server, allowing the administrator to rescue the system.

Flash Lock

Flash Lock is a mechanism that binds the board and CF card (SQFlash) together. The user can "Lock" SQFlash via the Flash Lock function and "Unlock" it via BIOS while booting. A locked SQFlash cannot be read by any card reader or boot from other platforms without a BIOS with the "Unlock" feature.