

NXE-IQM57A MotherBoard Hardware Document

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Document Revision History

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I. Introduction

The **NXE-IQM57A** motherboard offers high reliability industrial application solution. This motherboard have featuring the Intel Mobile i series processor (1'st generation) with integrated HD Graphics controller and Intel QM57 PCH chipset. Additional H/W platform features DDR3 1066 / 800 System memory, SATA2(3Gbps) port, Mini PCI-Express x1 slot, Giga-bit LAN based on PCI-Express x1 interface, HDMI, LVDS, PCI, Universal Serial Bus 2.0 and PCI audio solution with HD audio CODEC. This motherboard supports to Intel Active Management Technology (iAMT) for System Management.

1. General description

- θ Main board
 - PCB size in the special form factor
 - 170mm * 170mm * 1.6T (8 Layers)
- θ Processors
 - **Support PGA-988A Package**
 - **Support Arrandale MCP Mobile Processor**
 - **Core i7-600, i5-500, i3-300 and Celeron P4500 mobile series processor**
 - **Integrated HD Graphics controller**
 - **Dual display capable**
 - **Integrated Memory controller**
 - **Support DDR3-1066/800**
- θ Main Chipset
 - Platform Controller Hub (PCH) : **Intel 82QM57**
 - LPC SIO Controller : **ITE8781F**
 - Ethernet PHY controller : **Intel WG82577LM**
 - HD Audio CODEC : **RealTek ALC662 HD CODEC**
 - LVDS Transmitter : **Chrontel CH7308**
 - HDMI Transmitter : **Pericom PI3VDP411LS**
 - Clock Generator : **ICS9LPR502xGLF (TSSOP / CK505) + IDT2305**
 - DC-DC Subsystem : **Intersil ISL62882HRTZ (IMVP-6.5)**
- θ Memory Subsystem
 - System Memory
 - Support for DDR3 at 1066 and 800 memory
 - Support up to 8GB Maximum memory (4GB per Channel)
 - Non-ECC, Unbuffered DDR3 SO-DIMMs Only
 - 64-bit wide data bus per channel
 - Support 1-Gb and 2-Gb DRAM Technology
 - Support for x8 and x16 devices DDR3 SO-DIMM
 - Support for DDR3 On-Die Termination (ODT)
 - Flash Memory (SPI) : programmable 64-Mb Flash memory for BIOS and AMT firmware
- θ Integrated Graphics controller
 - 5th-generation graphics core
 - Support Dynamic Video Memory technology (Intel DVMT)
 - Support Intel Clear Video Technology
 - MPEC2 Hardware Acceleration
 - WMV9/VC1 Hardware Acceleration
 - AVC Hardware Acceleration
 - High Quality Scaling
 - Integrated 12 Execution Units (EU)
- θ Display Interface
 - Analog and Digital ports are supported through the Intel 5 series chipset PCH
 - Support 1-LVDS, 1-VGA(analog) and 2-HDMI ports
 - Support Up to 2-Independent display at once
 - Support Up to 1920 x 1080 resolution for LVDS

- Support Up to 1920 x 1200 @60Hz for HDMI (Not Tested)
- Support Up to 2048 x 1536 @75Hz for VGA (Not Tested)

- ① Intel Virtualization Technology (Intel VT)
 - Support VT-d
 - Intel VT-d 1.0a spec.
 - Support VT-x
 - Support by Processor core

- ① Integrated Serial ATA Host Controller
 - Support Up to 2 ports
 - Data transfer rates up to 3.0 Gb/s (SATA II)
 - Integrated AHCI controller
 - Support RAID mode for RAID 0/1
 - Support SATA spec. Rev.1.0

- ① USB Controllers
 - Integrated Universal Host Controller Interface (UHCI) controller (USB 1.1)
 - Integrated Enhanced Host Controller Interface (EHCI) controller (USB 2.0)
 - Support Up to 8 ports (Rear-4ports, Internal-4ports)
 - Support legacy Keyboard / Mouse

- ① Ethernet Subsystem
 - Support 10/100/1000 Mbps
 - Supports IEEE802.3
 - PCI Express based interface connection
 - Automatic MDI/MDIX crossover at all speeds of operation

- ① Super I/O Subsystem
 - Complies with LPC Interface spec. rev1.1
 - Fan Speed controller
 - Provide Smart Guardian Fan speed automatic control
 - CPU Fan and System Fan control
 - Monitor for CPU and system Fan speed
 - Monitoring for CPU and system temperature
 - Support 4-standard serial port (Integrated 16C550 UART)
 - Support Watch Dog Timer
 - Time resolution 1-minute or 1-second
 - Support up to 65535-minutes or 65535-seconds

- ① Audio Subsystem
 - RealTek ALC662 CODEC
 - High Definition Audio Codec
 - All DAC support independent 44.1k/48k/96kHz sample rate
 - All ADC support independent 44.1k/48k/96kHz sample rate
 - Software selectable boost gain (+10/+20/+30dB) for analog microphone input
 - Supports Line-out, Mic.-in and internal Line-out

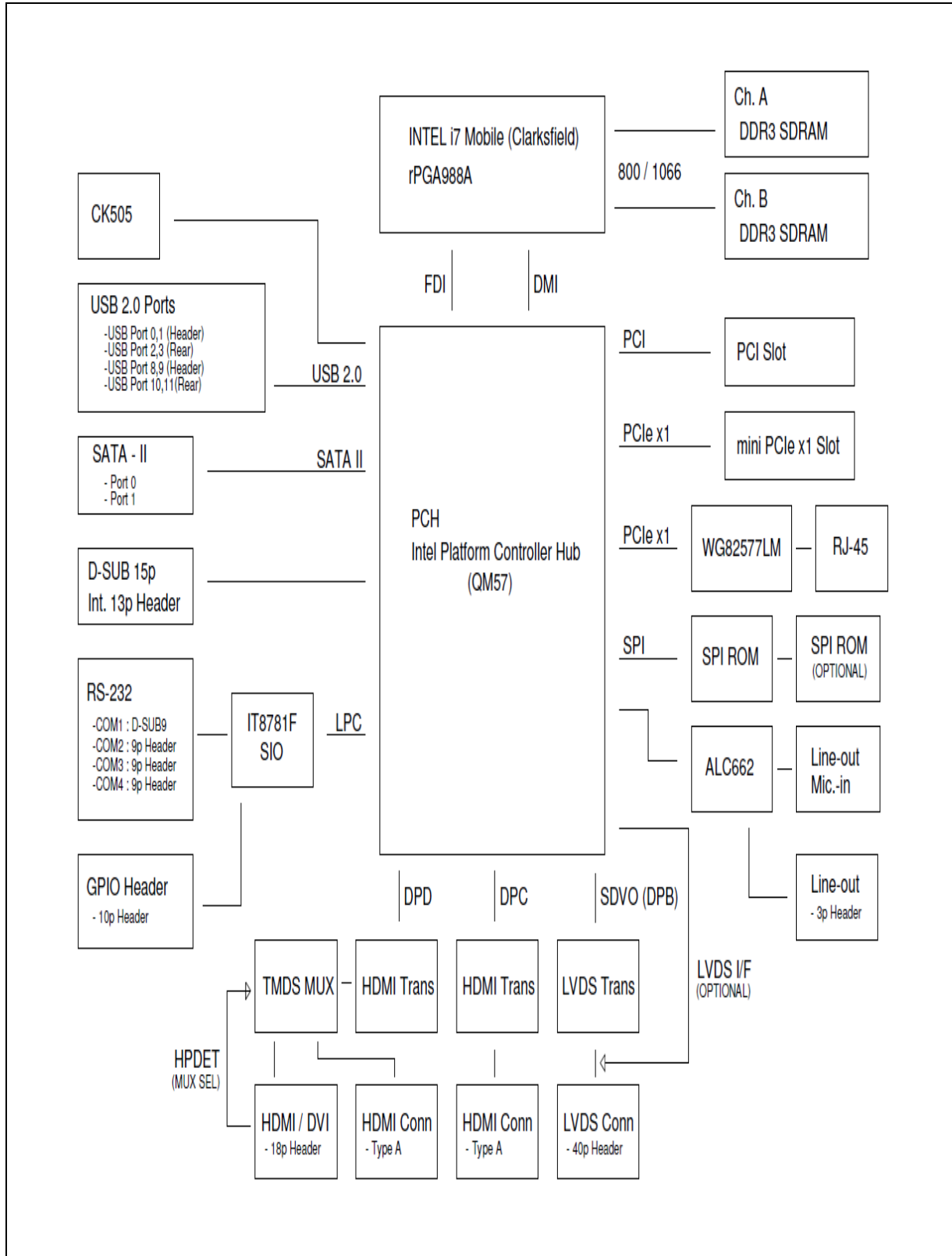
- ① PCI Interface Subsystem
 - Supports PCI Rev 2.3 spec at 33MHz
 - Support for 64-bit addressing on PCI using DAC protocol

- ① PCI Express Subsystem
 - Support mini-PCIe x1 slot
 - PCI Express 2.0 spec. running at 2.5GT/s
 - Support for full 2.5Gb/s bandwidth in each direction

- ① Active Management Technology Subsystem (iAMT)
 - Support advanced manageability feature
 - Client manageability using the wired network
 - Support KVM / Serial over Lan function

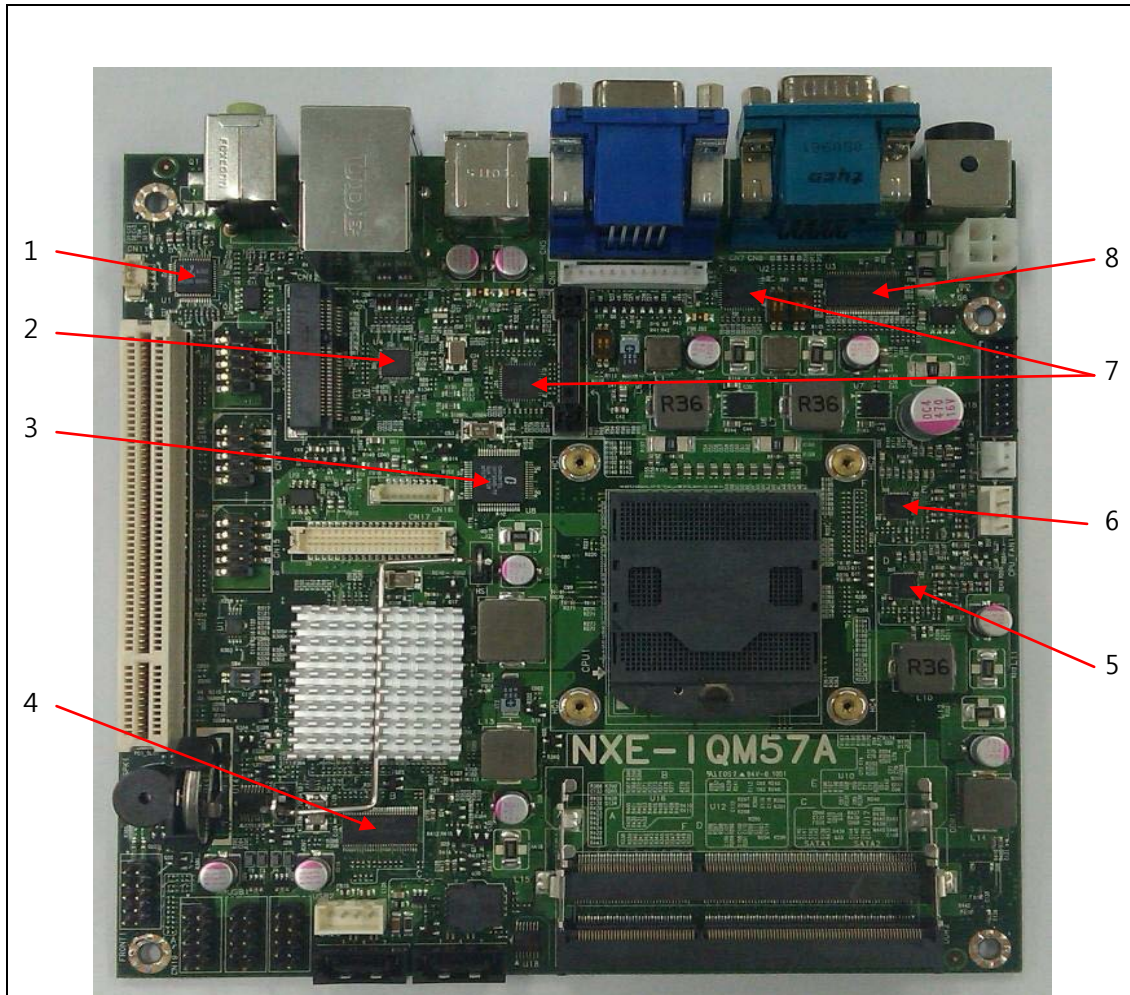
- Support IDE-R function
- θ I/O Subsystem
 - Internal Interface connector
 - Two SATA Connector (SATA-II, 3.0Gbps)
 - One 4P +12V DC-input Power Connector
 - Two 2*5-1 Header Connectors for four USB2.0 Interface
 - Three 2*5-1 Header for RS-232 Interface
 - One CPU FAN Connector (4P) with fan control
 - One System FAN Connector (3P)
 - One 2*20 Header Connector for LVDS (Dual-channel support)
 - One 1*8 LCD Inverter Connector with brightness control
 - One 1*3 Header for Audio-out
 - One 2*9 Header Connector for HDMI/DVI
 - One 1*13 Header Connector for VGA
 - One 1*4 Header Connector for DC-output (for SATA Power)
 - One 2*5 Header for Power switch, HDD/PWR LED and Reset switch
 - One 2*5 Header for GPIO
 - One two-channel half-pitch DIP switch for RTC Reset
 - External Interface connector (Rear-port)
 - Two HDMI ports
 - One D-SUB15 (RGB connector)
 - Four USB 2.0 ports
 - One 10/100/1000 Gbps Ethernet port
 - One Serial port (D-Sub 9p)-COM1
 - One Line-out, One Mic-in
 - One +12V DC-input DIN-422 jack
- θ Miscellaneous part
 - Battery: Coin Type (CR2032)
 - One Power LED for system power ready indication (standby power LED)

2. Functional Block Diagram

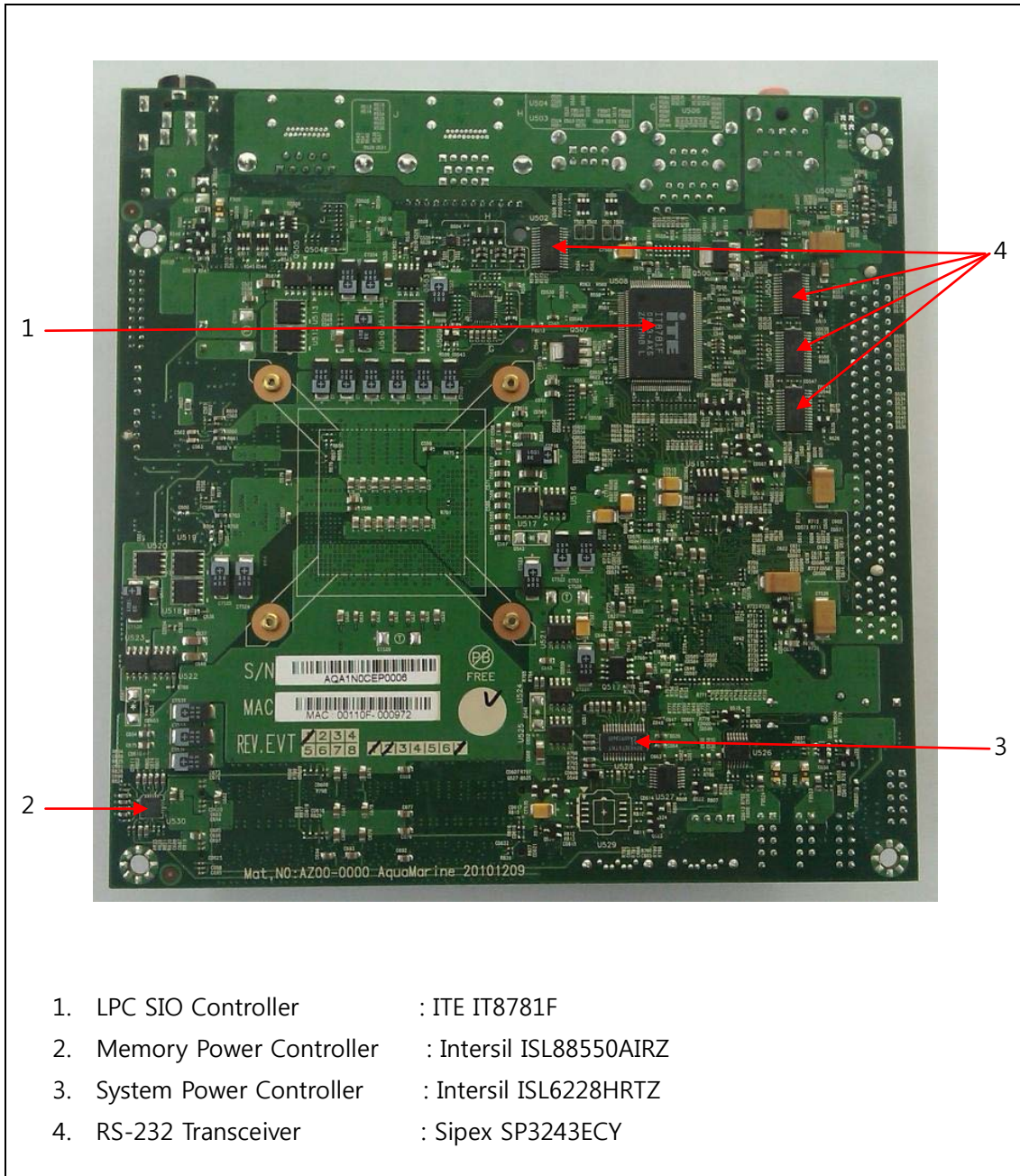


II. System Overview

1. NXE-IQM57A Mother-Board



- | | |
|-------------------------|---------------------------|
| 1. Audio CODEC | : RealTek ALC662 |
| 2. Ethernet PHY | : Intel WG82577LM |
| 3. LVDS Transmitter | : Chronitel CH7308B |
| 4. Clock Generator | : ICS 9LPR502SGLF |
| 5. GFX Power Controller | : Intersil ISL62882HRTZ |
| 6. CPU Power Controller | : Intersil ISL62882HRTZ |
| 7. HDMI Transmitter | : Pericom PI3VDP411LS |
| 8. HDMI MUX | : Pericom PI3HDMI1210-ABE |



2. Upgradeability

2-1. Processor

- Available CPUs
 - Mobile i series arrandale MCP proecssor
 - Core i7-600 series
 - Core i5-500 series
 - Core i3-300 series
 - Celeron P4500 processor
 - Support rPGA-988A package processor
 - Support Max 35W TDP

2-2. Memory

The NXE-IQM57A motherboard has two Small Outline Dual Inline Memory Module (SO-DIMM), minimum 512MB to maximum 8GB memory size. The BIOS detects the memory type, size, and speed through SMBUS interface between the core chipset and SO-DIMM module automatically.

The motherboard supports the following memory features

- Maximum memory size: 8GB
- Support DDR3-1066, DDR3-800
- Two Memory Channel configurations: Dual-channel Symmetric or Dual-channel Asymmetric
- 64-bit wide per channel
- 1Gb and 2Gb memory technologies supported
- Support for x8 and x16 unbuffered non-ECC DDR3 devices
- Support for DDR3 On-Die Termination (ODT)
- Supports partial writes to memory using data mask signals (DM)
- Support Intel Flex Memory Technology mode

2-3 BIOS

θ SPI Flash (64M-bit, 64Kbyte x 128blocks)

The NXE-IQM57A motherboard uses a AMI BIOS which is stored in the flash memory. An old version of the BIOS can be updated to the newer version using the flash utility. And OEM logo and SETUP default values can be changed using the AMI utility.

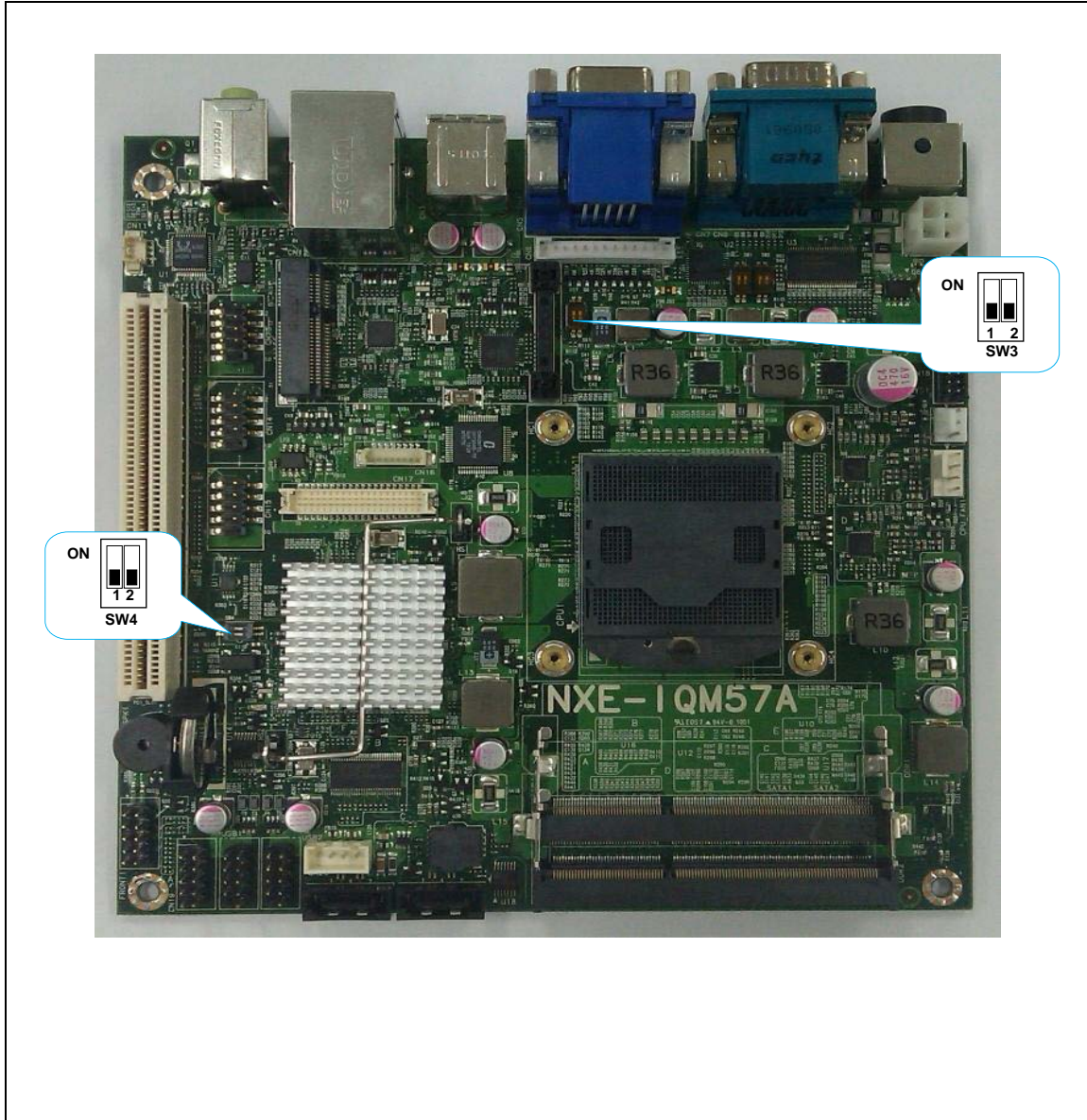
θ BIOS Specification

- Includes the Video BIOS for integrated Graphic Controller
- Supports PCI2.2, PnP1.0a, SMBIOS2.3, CDROM Boot 1.01, UUID, PXE boot, and so on
- Supports S0,S1,S3,S4 and S5 state of ACPI Rev1.0b
- Supports AMT 6.0

► For more details, refer to the BIOS documentation.

III. Jumpers , Connectors & Ports Descriptions

1. Board Switch Settings



1-1. RTC Clear Switch Descriptions (SW4, 1.27mm Half-Pitch)

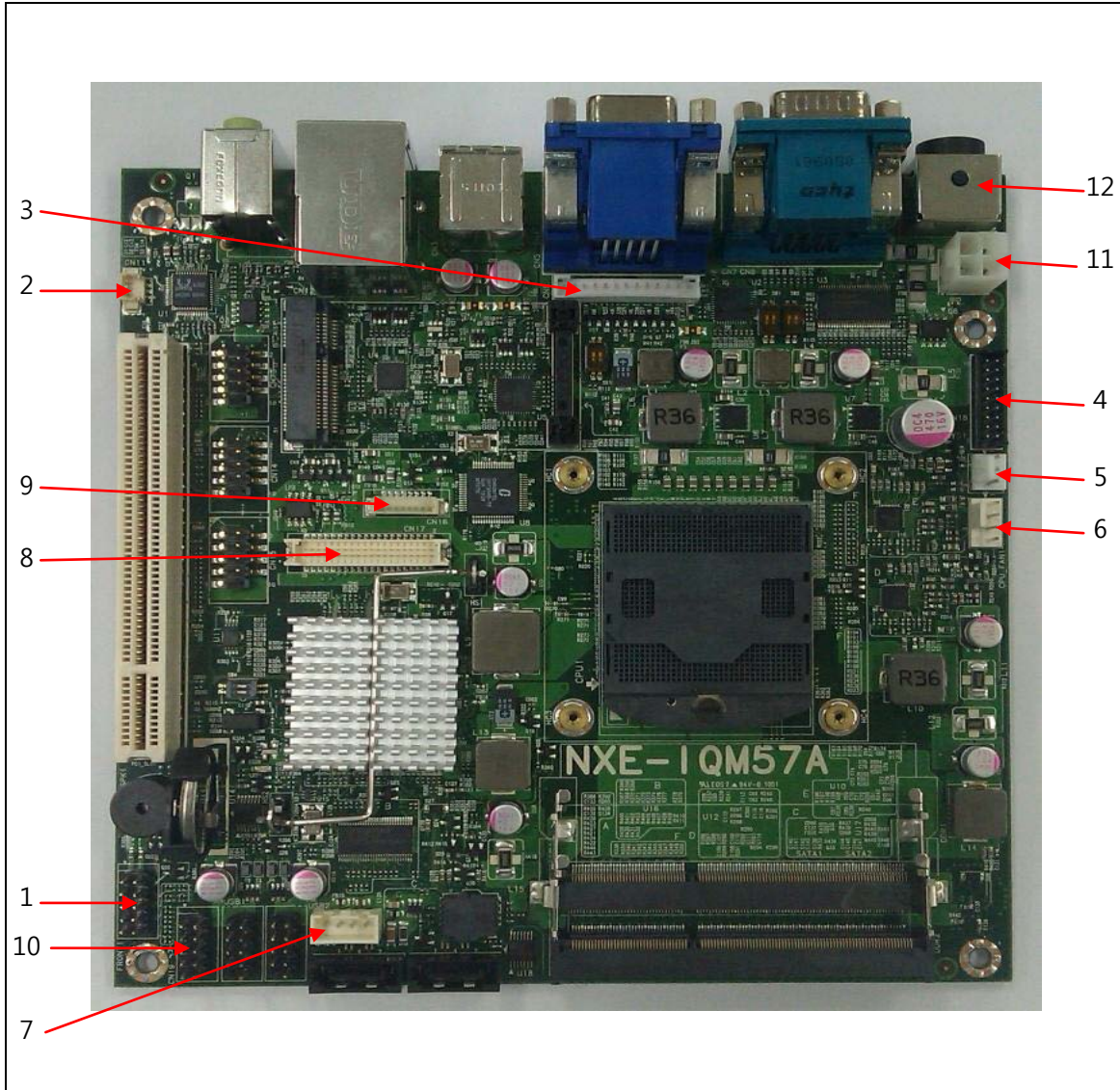
Channel	Function	ON	OFF	Remarks
1	CMOS Clear	Clear	Normal	
2	System RTC Clear	Clear	Normal	

1-2. Internal HDMI/DVI Switch Descriptions (SW3, 1.27mm Half-Pitch)

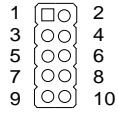
Channel	Function	ON	OFF	Remarks
1	EQ0	-	-	
2	OC1	DVI	HDMI	Internal Connector

2. I/O Headers & Connectors Descriptions

2-1. Motherboard Internal Connectors

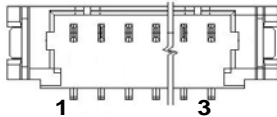


1) Front IO Connector (Front1, 2.54mm normal pin header)



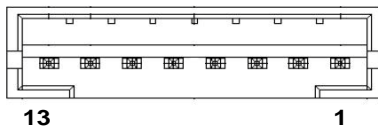
Pin number	Signal description
1	HDD LED +
2	SYSTEM LED +
3	HDD LED -
4	SYSTEM LED -
5	GND
6	GND
7	Power Button Switch
8	System Reset switch
9	GND
10	GND

2) Internal Audio Connector (CN11, 12505WS-03 / YeonHo)



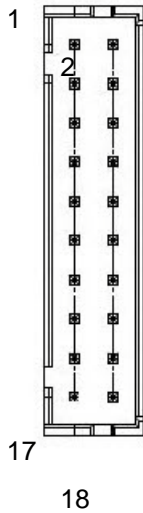
Pin number	Signal description
1	Line-Out Right
2	Ground
3	Line-Out Left

3) Internal VGA Connector (CN6, 20010WS-13 / YeonHo)



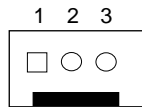
Pin number	Signal description
1	RED
2	GND
3	BLUE
4	GND
5	GREEN
6	GND
7	DDC DATA
8	GND
9	HSYNC
10	VSYNC
11	GND
12	DDC CLK
13	VCC (+5V)

4) Internal HDMI/DVI Connector (CN18, YDW200-18 / YeonHo)



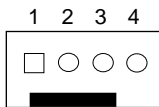
Pin number	Signal description
1	GND
2	CLK-
3	CLK+
4	GND
5	DATA2-
6	DATA2+
7	GND
8	DATA1+
9	DATA1-
10	GND
11	DATA0-
12	DATA0+
13	GND
14	DDC DATA
15	DDC CLK
16	GND
17	Hot Plug Detect
18	VCC(+5)

5) System Fan Connector (SYS1, HF0803E / FOXCONN)



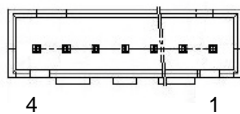
Pin number	Signal description
1	GND
2	+12V
3	Fan Tachometer

6) CPU Fan Connector (CPU_FAN1, 1470947-1 / AMP)



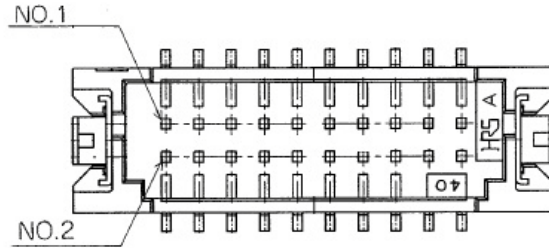
Pin number	Signal description
1	GND
2	+12V
3	Fan Tachometer
4	Fan Control

7) SATA Power Connector (CN20, SMW250-04 / YeonHo)



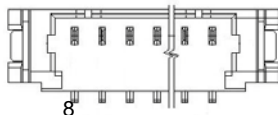
Pin number	Signal description
1	+12V
2	GND
3	GND
4	+5V

8) LVDS I/F Connector (CN17, DF13A-40DP-1.25V / Hirose)



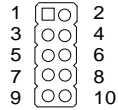
Pin number	Signal description	Pin number	Signal description
1	TX0-	21	TX7+
2	TX0+	22	TX_CLK2-
3	TX1-	23	TX_CLK2+
4	TX1+	24	GND
5	TX2-	25	PULL-UP(+5V)
6	TX2+	26	PULL-DOWN(GND)
7	GND	27	GND
8	TX_CLK1-	28	GND
9	TX_CLK1+	29	GND
10	TX3-	30	+5V
11	TX3+	31	+5V
12	TX4-	32	+5V
13	TX4+	33	+3.3V
14	GND	34	+3.3V
15	TX5-	35	+12V
16	TX5+	36	+12V
17	GND	37	+12V
18	TX6-	38	+12V
19	TX6+	39	+12V
20	TX7-	40	+12V

9) LVDS Inverter Connector (CN16, 12505WS-08A00 / YeonHo)



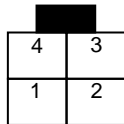
Pin number	Signal description
1	+12V
2	+12V
3	+12V
4	BACK-LIGHT ENABLE
5	BRIGHTNESS ADJ
6	GND
7	GND
8	GND

10) GPIO I/F Connector (CN19, 2.54mm Normal Pin Header)



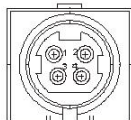
<i>Pin number</i>	<i>Signal description</i>
1	+5V
2	GPIO5(default:GPI)
3	GPIO1(default:GPO)
4	GPIO6(default:GPI)
5	GPIO2(default:GPO)
6	GPIO7(default:GPI)
7	GPIO3(default:GPO)
8	GPIO8(default:GPI)
9	GPIO4(default:GPO)
10	GND

11) System Power Input Connector (CN10, ABA-POW-003-K04 / Lotes)



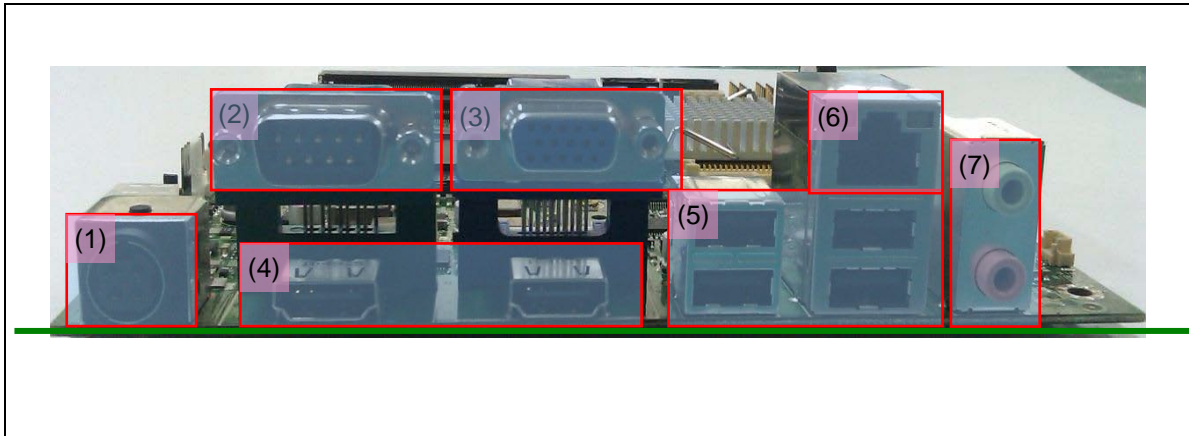
<i>Pin number</i>	<i>Signal description</i>
1	GND
2	GND
3	+12V_IN
4	+12V_IN

12) DC-In Jack (CN9, Power DIN-422)



<i>Pin number</i>	<i>Signal description</i>
1	GND
2	+12V_IN
3	GND
4	+12V_IN

2-2. Motherboard Rear-port Connectors



No.	Functions	Location	Note
(1)	+12V DC-In Jack (Power DIN422)	CN9	
(2)	COM1 Serial port	CN8	
(3)	VGA output port (analog)	CN5	
(4)	HDMI output port	CN4, CN7	
(5)	USB 2.0 port	CN3, CN2	
(6)	10/100/1000 Gbps Ethernet port	CN2	
(7)	Audio port - Lime : Line-out - Pink : Mic-in	CN1	