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WWW.BIOSTAR.COM.TW

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CE

Dichiarazione di conformità sintetica
Ai sensi dell'art. 2 comma 3 del D.M. 275 del 30/10/2002
Si dichiara che questo prodotto è conforme alle normative vigenti e soddisfa i requisiti essenziali richiesti dalle direttive 2004/108/CE, 2006/95/CE e 1999/05/CE quando ad esso applicabili

Short Declaration of conformity
We declare this product is complying with the laws in force and meeting all the essential requirements as specified by the directives 2004/108/CE, 2006/95/CE and 1999/05/CE whenever these laws may be applied

Table Of Contents

Chapter 1: Introduction

1.1 Before You Start

Thank you for choosing our product. Before you start installing the motherboard, please make sure you follow the instructions below:

- Prepare a dry and stable working environment with sufficient lighting.
- Always disconnect the computer from power outlet before operation.
- Before you take the motherboard out from anti-static bag, ground yourself properly by touching any safely grounded appliance, or use grounded wrist strap to remove the static charge.
- Avoid touching the components on motherboard or the rear side of the board unless necessary. Hold the board on the edge, do not try to bend or flex the board.
- Do not leave any unfastened small parts inside the case after installation. Loose parts will cause short circuits which may damage the equipment.
- Keep the computer from dangerous area, such as heat source, humid air and water.
- The operating temperatures of the computer should be 0 to 45 degrees Celsius.
- To avoid injury, be careful of:
  Sharp pins on headers and connectors
  Rough edges and sharp corners on the chassis
  Damage to wires that could cause a short circuit

1.2 Package Checklist

- Serial ATA Cable x2
- Rear I/O Panel for ATX Case x1
- Quick Installation Guide x1
- Fully Setup Driver DVD x1

Note

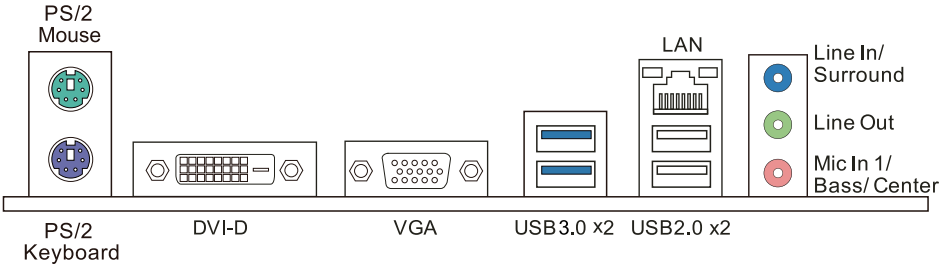
» *The package contents may be different due to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.*

1.3 Specifications

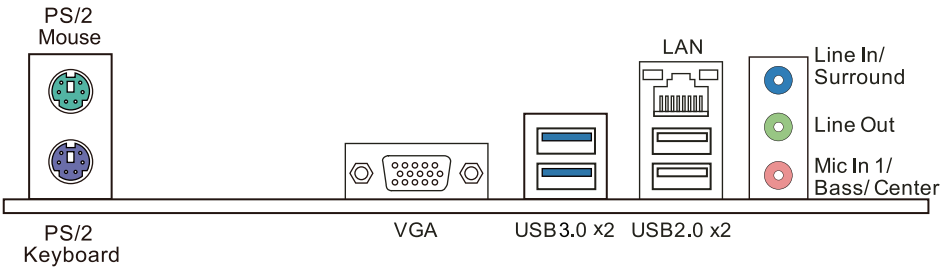
Specifications	
CPU Support	Socket FM2+ supports AMD FM2+/FM2 A-series APU Maximum CPU TDP (Thermal Design Power): 100Watt * Please refer to www.biostar.com.tw for CPU support list.
Chipset	AMD A70M FCH
Memory	Supports Dual Channel DDR3 800/ 1066/ 1333/ 1600/ 1866/ 2133/ 2400(OC)/ 2600(OC) 2 x DDR3 DIMM Memory Slot, Max. Supports up to 32 GB Memory Each DIMM supports non-ECC 512MB/ 1/ 2/ 4/ 8/ 16 GB DDR3 module * Please refer to www.biostar.com.tw for Memory support list.
Storage	AMD A70M FCH 4x SATA 6Gb/s Connector Supports RAID 0,1,10 & AHCI
LAN	Realtek RTL 8111G 10/ 100/ 1000 Mb/s auto negotiation, Half / Full duplex capability
Audio Codec	ALC662 5.1 Channels, High Definition Audio
USB	AMD A70M FCH 4x USB 3.0 port (2 on rear I/Os and 2 via internal headers) 6x USB 2.0 port (2 on rear I/Os and 4 via internal headers)
Expansion Slots	1x PCI Slot 1x PCIe x1 Slot 1x PCIe 3.0 x16 Slot (Only FM2+ processors can support PCIe 3.0)
Rear I/Os	1x PS/2 Mous 1x PS/2 Keyboard 1x DVI Port (A70MD PRO/A68MD PRO) 1x VGA Port 1x LAN port 2x USB 3.0 Port 2x USB 2.0 Port 3x Audio Jack
Internal I/Os	4x SATA 6.0Gb/s Connector 2x USB 2.0 Header (each header supports 2 USB 2.0 ports) 1x USB 3.0 Header (each header supports 2 USB 3.0 ports) 1x 4-Pin Power Connector 1x 24-Pin Power Connector 1x CPU Fan Connector 1x System Fan Connector 1x Front Panel Header 1x Front Audio Header 1x Clear CMOS Header 1x Serial Port Header
Form Factor	microATX Form Factor, 226 mm x 174 mm
OS Support	Windows XP/ 7/ 8/ 8.1/10 (*Some CPUs may not support Windows XP.) Biostar reserves the right to add or remove support for any OS with or without notice.

1.4 Rear Panel Connectors

A70MD PRO/A68MD PRO



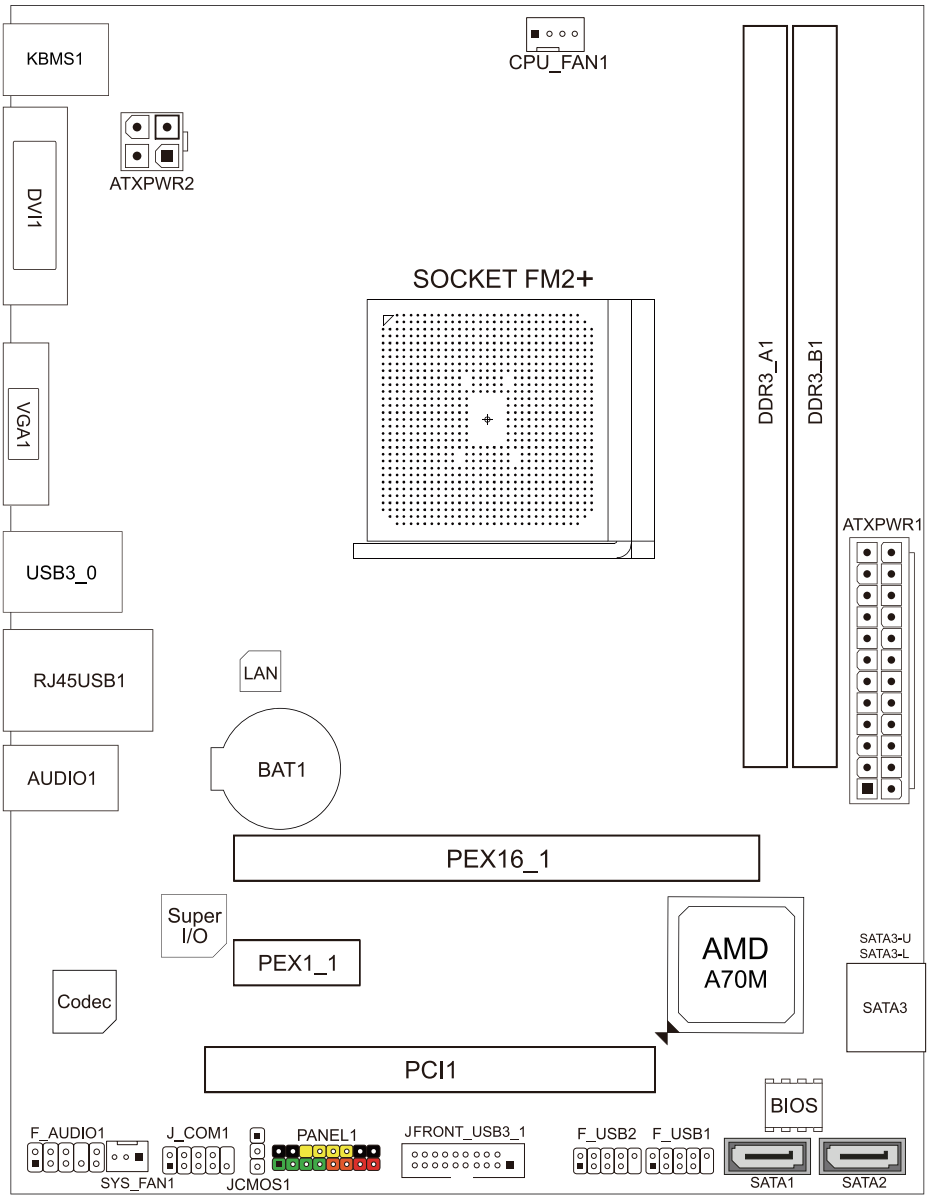
A70MG PRO



Note

- » *DVI-D / VGA output require an AMD family processor with intedrated graphics.*
- » *Since the audio chip supports High Definition Audio Specification, the function of each audio jack can be defined by software. The input / output function of each audio jack listed above represents the default setting. However, when connecting external microphone to the audio port, please use the Line In (Blue) and Mic In (Pink) audio jack.*
- » *Maximum resolution*
  VGA: 1920 x 1600 @60Hz
  DVI-D: 1920 x 1200 @60Hz / 2560 x 1600 @60Hz

1.5 Motherboard Layout



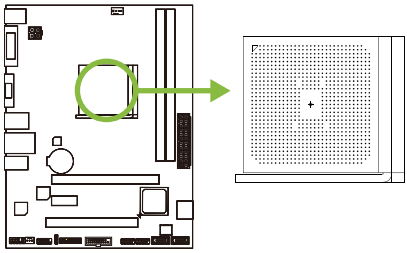
Note

» ■ *represents the 1st pin.*

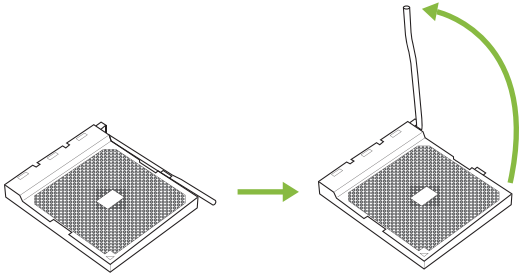
Chapter 2: Hardware installation

2.1 Install Central Processing Unit (CPU)

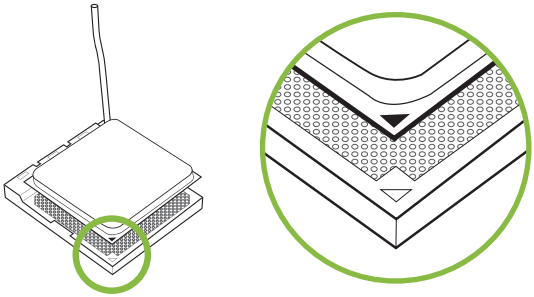
Step 1: Locate the CPU socket on the motherboard



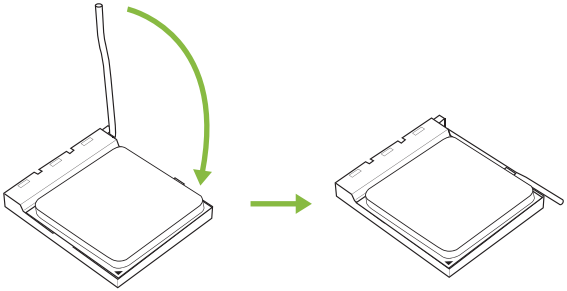
Step 2: Pull the socket locking out from the socket and then raise the lever up to a 90-degree angel.



Step 3: Look for the white triangle on socket, and the gold triangle on CPU should point towards this white triangle. The CPU will fit only in the correct orientation.

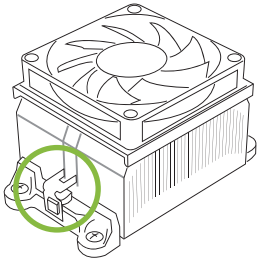


Step 4: Hold the CPU down firmly, and then close the lever to locked the position

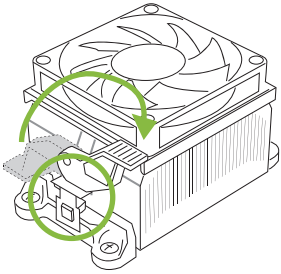


2.2 Install a Heatsink

Step 1: Place the heatsink and fan assembly onto the retention frame. Match the heatsink clip with the socket mounting-lug. Hook the spring clip to the mounting-lug.



Step 2: On the other side, push the retention clip straight down to lock into the plastic lug on the retention frame, and then press down the locker until it stops.



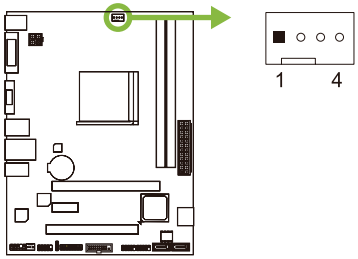
Note

» *Do not forget to connect the CPU fan connector.*
» *For proper installation, please kindly refer to the installation manual of your CPU heatsink.*

2.3 Connect Cooling Fans

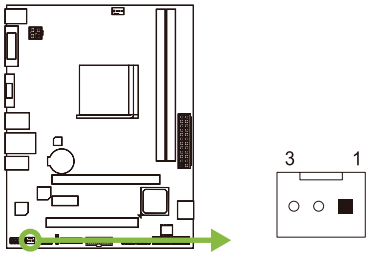
These fan headers support cooling-fans built in the computer. The fan cable and connector may be different according to the fan manufacturer.

CPU_FAN1: CPU Fan Header



Pin	Assignment
1	Ground
2	+12V
3	FAN RPM rate sense
4	Smart Fan Control (By Fan)

SYS_FAN1: System Fan Header



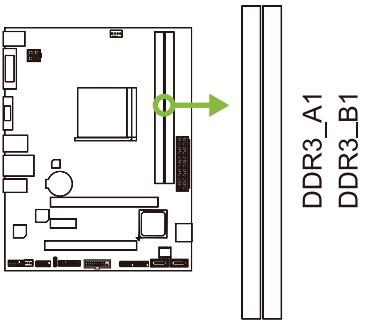
Pin	Assignment
1	Ground
2	+12V
3	FAN RPM rate sense

Note

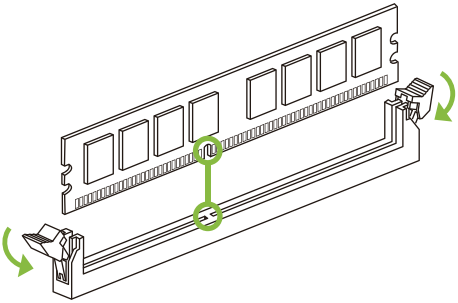
» *CPU_FAN1, SYS_FAN1 support 4-pin and 3-pin head connectors. When connecting with wires onto connectors, please note that the red wire is the positive and should be connected to pin#2, and the black wire is Ground and should be connected to pin#1(GND).*

2.4 Install System Memory

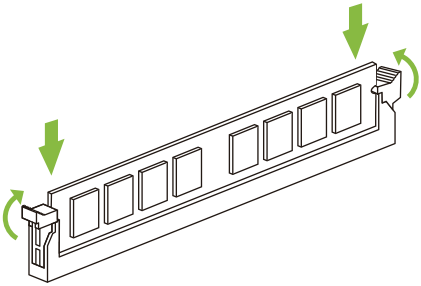
DDR3 Modules



Step 1: Unlock a DIMM slot by pressing the retaining clips outward. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



Step 2: Insert the DIMM vertically and firmly into the slot until the retaining clips snap back in place and the DIMM is properly seated.



Note

» *If the DIMM does not go in smoothly, do not force it. Pull it all the way out and try again.*

Memory Capacity

DIMM Socket Location	DDR3 Module	Total Memory Size
DIMMA1	4GB/8GB/16GB	Max is 32GB.
DIMMB1	4GB/8GB/16GB	

Dual Channel Memory Installation

Please refer to the following requirements to activate Dual Channel function:
Install memory module of the same density in pairs, shown in the table.

Dual Channel Status	DDR3_A1	DDR3_B1
Disabled	O	X
Disabled	X	O
Enabled	O	O

(O means memory installed, X means memory not installed.)

Note

» *When installing more than one memory module, we recommend to use the same brand and capacity memory on this motherboard.*

2.5 Expansion Slots

PEX16_1: PCI-Express Gen3 x16 Slot

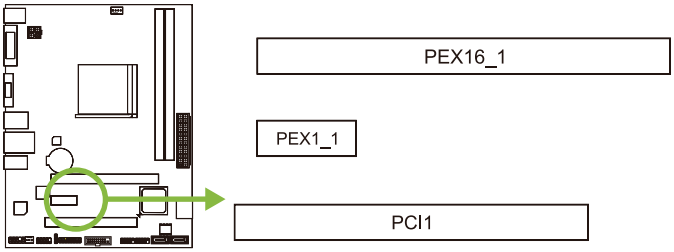
- PCI-Express 3.0 compliant.
- Maximum theoretical realized bandwidth of 16GB/s simultaneously per direction, for an aggregate of 32GB/s totally.

PEX1_1: PCI-Express Gen3 x1 Slot

- PCI-Express 3.0 compliant.
- Data transfer bandwidth up to 1GB/s per direction; 2GB/s in total

PCI1: Peripheral Component Interconnect Slot

- This motherboard is equipped with 1 standard PCI slot. PCI stands for Peripheral Component Interconnect, and it is a bus standard for expansion cards.



Install an Expansion Card

You can install your expansion card by following steps:

- Read the related expansion card's instruction document before install the expansion card into the computer.
- Remove your computer's chassis cover, screws and slot bracket from the computer.
- Place a card in the expansion slot and press down on the card until it is completely seated in the slot.
- Secure the card's metal bracket to the chassis back panel with a screw.
- Replace your computer's chassis cover.
- Power on the computer, if necessary, change BIOS settings for the expansion card.
- Install related driver for the expansion card.

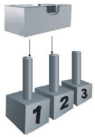
2.6 Jumper & Switch Setting

The illustration shows how to set up jumpers. When the jumper cap is placed on pins, the jumper is “close”, if not, that means the jumper is “open”.

Pin opened

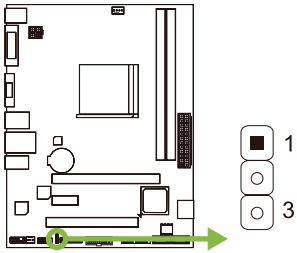
Pin closed

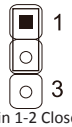
Pin 1-2 closed



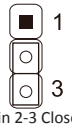
JCMOS1: Clear CMOS Jumper

The jumper allows users to restore the BIOS safe setting and the CMOS data. Please carefully follow the procedures to avoid damaging the motherboard.





Pin 1-2 Close:
Normal Operation (default).



Pin 2-3 Close:
Clear CMOS data.

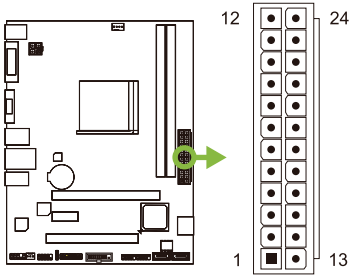
Clear CMOS Procedures:

1. Remove AC power line.
2. Set the jumper to “Pin 2-3 close”.
3. Wait for five seconds.
4. Set the jumper to “Pin 1-2 close”.
5. Power on the AC.
6. Load Optimal Defaults and save settings in CMOS.

2.7 Headers & Connectors

ATXPWR1: ATX Power Source Connector

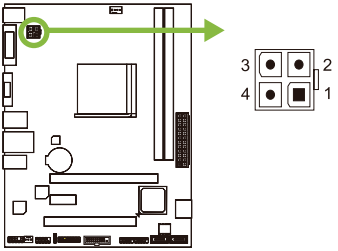
For better compatibility, we recommend to use a standard ATX 24-pin power supply for this connector. Make sure to find the correct orientation before plugging the connector.



Pin	Assignment	Pin	Assignment
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	Ground	3	Ground
16	PS_ON	4	+5V
17	Ground	5	Ground
18	Ground	6	+5V
19	Ground	7	Ground
20	NC	8	PW_OK
21	+5V	9	Standby Voltage+5V
22	+5V	10	+12V
23	+5V	11	+12V
24	Ground	12	+3.3V

ATXPWR2: ATX Power Source Connector

This connector will provide +12V to CPU power circuit.



Pin	Assignment
1	+12V
2	+12V
3	Ground
4	Ground

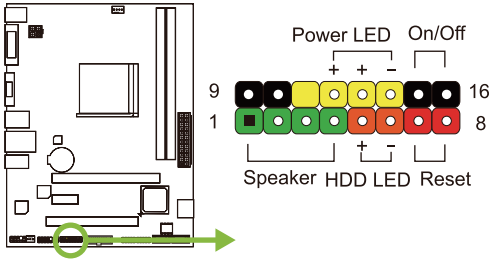
Note

» *Before you power on the system, please make sure that both ATXPWR1 and ATXPWR2 connectors have been plugged-in.*

» *Insufficient power supplied to the system may result in instability or the peripherals not functioning properly. Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices.*

PANEL1: Front Panel Header

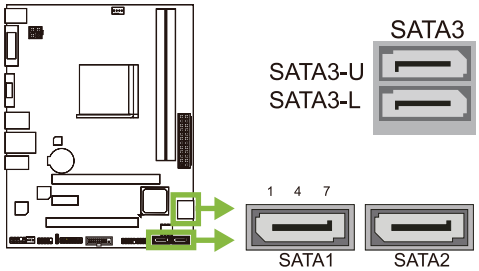
This 16-pin header includes Power-on, Reset, HDD LED, Power LED, and speaker connection.



Pin	Assignment	Function	Pin	Assignment	Function
1	+5V	Speaker Connector	9	N/A	N/A
2	N/A		10	N/A	
3	N/A		11	N/A	N/A
4	Speaker		12	Power LED (+)	Power LED
5	HDD LED (+)	Hard drive LED	13	Power LED (+)	
6	HDD LED (-)		14	Power LED (-)	
7	Ground	Reset button	15	Power button	Power-on button
8	Reset control		16	Ground	

SATA1~SATA3: Serial ATA 6.0 Gb/s Connectors

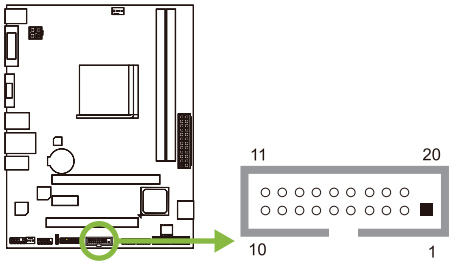
These connectors connect to SATA hard disk drives via SATA cables.



Pin	Assignment
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

JFRONT_USB3_1: Header for USB 3.0 Ports at Front Panel

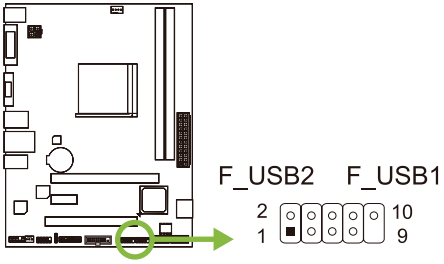
This header allows user to add additional USB ports on the PC front panel, and also can be connected with a wide range of external peripherals.



Pin	Assignment	Pin	Assignment
1	VBUS0	11	D2+
2	SSRX1-	12	D2-
3	SSRX1+	13	Ground
4	Ground	14	SSTX2+
5	SSTX1-	15	SSTX2-
6	SSTX1+	16	Ground
7	Ground	17	SSRX2+
8	D1-	18	SSRX2-
9	D1+	19	VBUS1
10	ID	20	Key

F_USB1/2: Header for USB 2.0 Ports at Front Panel

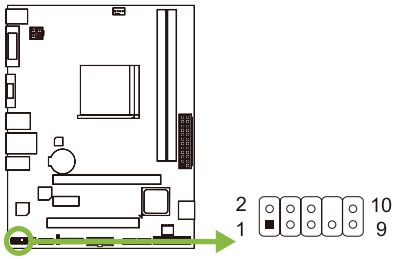
This header allows user to add additional USB ports on the PC front panel, and also can be connected with a wide range of external peripherals.



Pin	Assignment
1	+5V (fused)
2	+5V (fused)
3	USB-
4	USB-
5	USB+
6	USB+
7	Ground
8	Ground
9	Key
10	NC

F_AUDIO1: Front Panel Audio Header

This header allows user to connect the chassis-mount front panel audio I/O which supports HD and AC'97 audio standards.



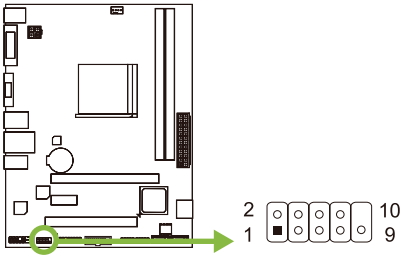
HD Audio		AC'97	
Pin	Assignment	Pin	Assignment
1	Mic Left in	1	Mic In
2	Ground	2	Ground
3	Mic Right in	3	Mic Power
4	GPIO	4	Audio Power
5	Right line in	5	RT Line Out
6	Jack Sense	6	RT Line Out
7	Front Sense	7	Reserved
8	Key	8	Key
9	Left line in	9	LFT Line Out
10	Jack Sense	10	LFT Line Out

Note

- » *It is recommended that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high definition audio capability.*
- » *Please try to disable the "Front Panel Jack Detection" if you want to use an AC'97 front audio output cable. The function can be found via O.S. Audio Utility.*

J_COM1: Serial Port Connector

The motherboard has a serial port header for connecting RS-232 Port.



Pin	Assignment
1	Carrier detect
2	Received data
3	Transmitted data
4	Data terminal ready
5	Signal ground
6	Data set ready
7	Request to send
8	Clear to send
9	Ring indicator
10	Key

Chapter 3: UEFI BIOS & Software

3.1 UEFI BIOS Setup

- The BIOS Setup program can be used to view and change the BIOS settings for the computer. The BIOS Setup program is accessed by pressing the <DEL> key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins.
- For further information of setting up the UEFI BIOS, please refer to the UEFI BIOS Manual on our website.

3.2 BIOS Update

The BIOS can be updated using either of the following utilities:

- BIOSTAR BIOS Flasher: Using this utility, the BIOS can be updated from a file on a hard disk, a USB drive (a flash drive or a USB hard drive), or a CD-ROM.
- BIOSTAR BIOS Update Utility: It enables automated updating while in the Windows environment. Using this utility, the BIOS can be updated from a file on a hard disk, a USB drive (a flash drive or a USB hard drive), or a CD-ROM, or from the file location on the Web.

BIOSTAR BIOS Flasher

Note

» *This utility only allows storage device with FAT32/16 format and single partition.*
» *Shutting down or resetting the system while updating the BIOS will lead to system boot failure.*

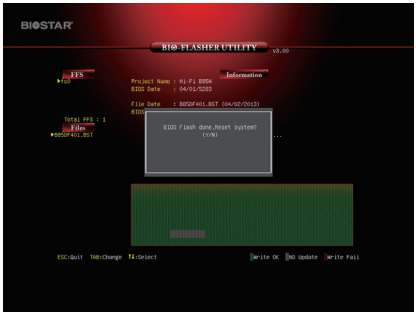
Updating BIOS with BIOSTAR BIOS Flasher

1. Go to the website to download the latest BIOS file for the motherboard.
2. Then, copy and save the BIOS file into a USB flash (pen) drive.
3. Insert the USB pen drive that contains the BIOS file to the USB port.
4. Power on or reset the computer and then press <F12> during the POST process.

5. After entering the POST screen, the BIOS-FLASHER utility pops out. Choose <fs0> to search for the BIOS file.

6. Select the proper BIOS file, and a message asking if you are sure to flash the BIOS file. Click “Yes” to start updating BIOS.

7. A dialog pops out after BIOS flash is completed, asking you to restart the system. Press the <Y> key to restart system.



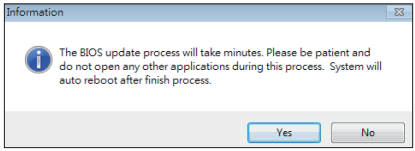
8. While the system boots up and the full screen logo shows up, press <DEL> key to enter BIOS setup.
After entering the BIOS setup, please go to the <Save & Exit>, using the <Restore Defaults> function to load Optimized Defaults, and select <Save Changes and Reset> to restart the computer. Then the BIOS Update is completed.

BIOS Update Utility (through the Internet)

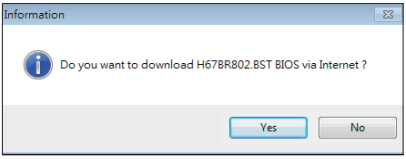
1. Installing BIOS Update Utility from the DVD Driver.
2. Please make sure the system is connected to the internet before using this function.

3. Launch BIOS Update Utility and click the “Online Update” button on the main screen.

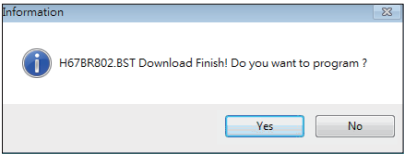
4. An open dialog will show up to request your agreement to start the BIOS update. Click “Yes” to start the online update procedure.



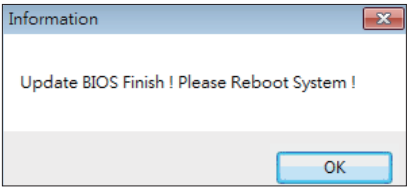
5. If there is a new BIOS version, the utility will ask you to download it. Click “Yes” to proceed.



6. After the download is completed, you will be asked to program (update) the BIOS or not. Click “Yes” to proceed.



7. After the updating process is finished, you will be asked you to reboot the system. Click “OK” to reboot.



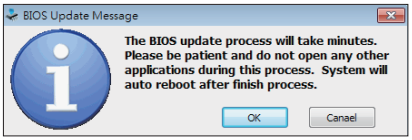
8. While the system boots up and the full screen logo shows up, press <DEL> key to enter BIOS setup.
After entering the BIOS setup, please go to the <Save & Exit>, using the <Restore Defaults> function to load Optimized Defaults, and select <Save Changes> and <Reset> to restart the computer. Then, the BIOS Update is completed.

BIOS Update Utility (through a BIOS file)

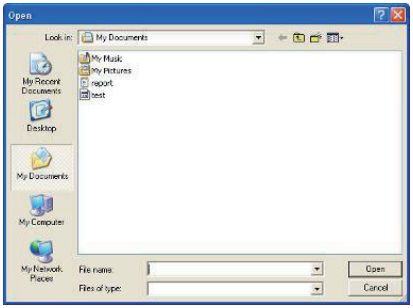
1. Installing BIOS Update Utility from the DVD Driver.
2. Download the proper BIOS from http://www.biostar.com.tw/

3. Launch BIOS Update Utility and click the “Update BIOS” button on the main screen.

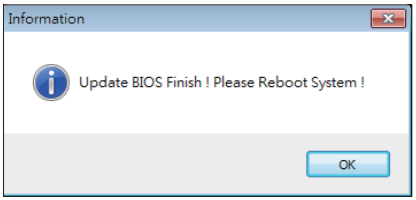
4. A warning message will show up to request your agreement to start the BIOS update. Click “OK” to start the update procedure.



5. Choose the location for your BIOS file in the system. Please select the proper BIOS file, and then click on “Open”. It will take several minutes, please be patient.



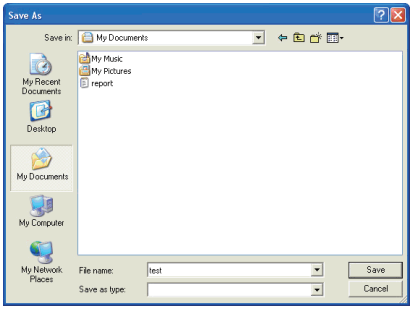
6. After the BIOS Update process is finished, click on “OK” to reboot the system.



7. While the system boots up and the full screen logo shows up, press <DEL> key to enter BIOS setup.
After entering the BIOS setup, please go to the <Save & Exit>, using the <Restore Defaults> function to load Optimized Defaults, and select <Save Changes and Reset> to restart the computer. Then, the BIOS Update is completed.

Backup BIOS

Click the Backup BIOS button on the main screen for the backup of BIOS, and select a proper location for your backup BIOS file in the system, and click “Save”.



3.3 Software

Installing Software

1. Insert the Setup DVD to the optical drive. The driver installation program would appear if the Auto-run function has been enabled.
2. Select Software Installation, and then click on the respective software title.
3. Follow the on-screen instructions to complete the installation.

Launching Software

After the installation process is completed, you will see the software icon showing on the desktop. Double-click the icon to launch it.

Note

» *All the information and content about following software are subject to be changed without notice. For better performance, the software is being continuously updated.*

» *The information and pictures described below are for your reference only. The actual information and settings on board may be slightly different from this manual.*

BIOScreen Utility

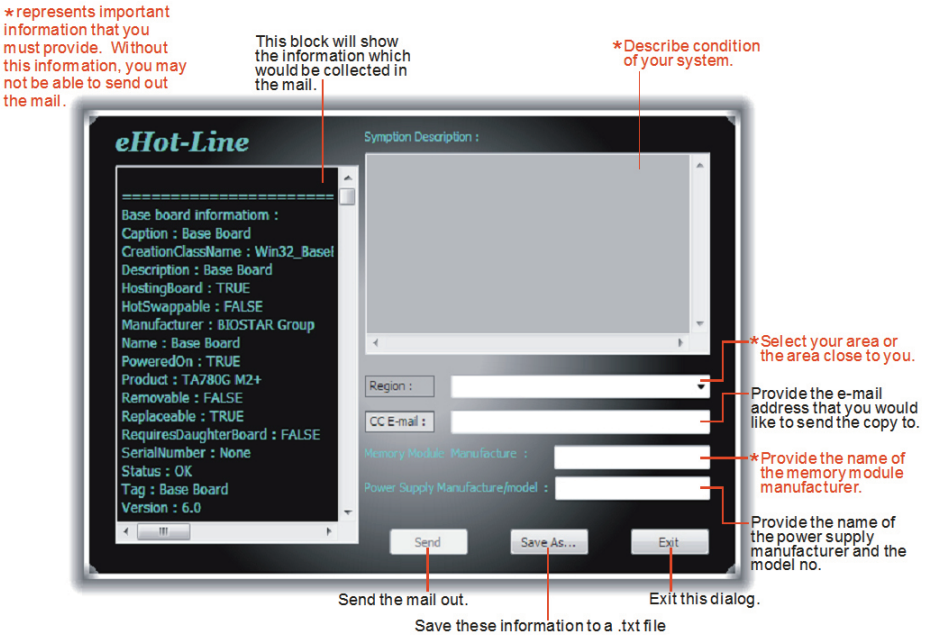
This utility allows you to personalize your boot logo easily. You can choose BMP as your boot logo so as to customize your computer.

Please follow the step-by-step instructions below to update boot logo:

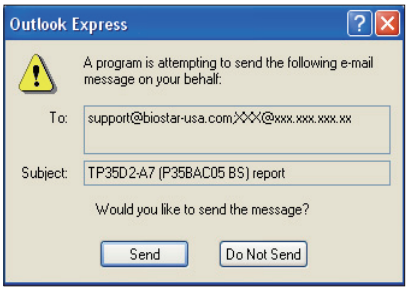
- Load Image: Choose the picture as the boot logo.
- Transform: Transform the picture for BIOS and preview the result.
- Update Bios: Write the picture to BIOS Memory to complete the update.

eHot-Line

eHot-Line is a convenient utility that helps you to contact with our Tech-Support system. This utility will collect the system information which is useful for analyzing the problem you may have encountered, and then send these information to our tech-support department to help you fix the problem.

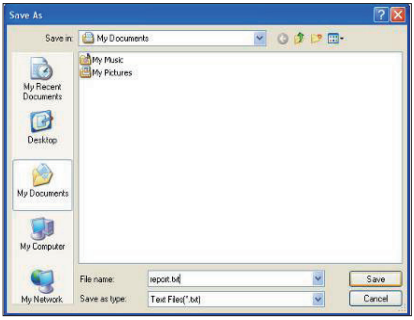


After filling up this information, click “Send” to send the mail out. A warning dialog would appear asking for your confirmation; click “Send” to confirm or “Do Not Send” to cancel.

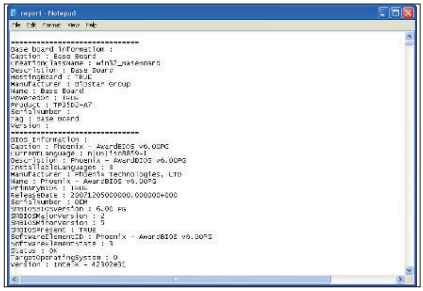


If you want to save this information to a .txt file, click “Save As...” and then you will see a saving dialog appears asking you to enter file name.

Enter the file name and then click “Save”. Your system information will be saved to a .txt file.



Open the saved .txt file, you will see your system information including motherboard/BIOS/CPU/ video/device/OS information. This information is also concluded in the sent mail.



Note

- » *Before you use this utility, please set Outlook Express as your default e-mail client application program.*
- » *We will not share customer’s data with any other third parties, so please feel free to provide your system information while using eHot-Line service.*
- » *If you are not using Outlook Express as your default e-mail client application, you may need to save the system information to a .txt file and send the file to our tech support with other e-mail application. Go to the following website http://www.biostar.com.tw/app/en/about/contact.php for getting our contact information.*

Chapter 4: Useful help

4.1 Driver Installation

After you installed your operating system, please insert the Fully Setup Driver DVD into your optical drive and install the driver for better system performance.
You will see the following window after you insert the DVD

The setup guide will auto detect your motherboard and operating system.

A. Driver Installation

To install the driver, please click on the Driver icon. The setup guide will list the compatible driver for your motherboard and operating system. Click on each device driver to launch the installation program.

B. Software Installation

To install the software, please click on the Software icon. The setup guide will list the software available for your system, click on each software title to launch the installation program.

C. Manual

Aside from the paperback manual, we also provide manual in the Driver DVD. Click on the Manual icon to browse for available manual.

Note

» *If this window didn't show up after you insert the Driver DVD, please use file browser to locate and execute the file SETUP.EXE under your optical drive.*

» *You will need Acrobat Reader to open the manual file. Please download the latest version of Acrobat Reader software from http://get.adobe.com/reader/*

4.2 AMI BIOS Beep Code

Boot Block Beep Codes

Number of Beeps	Description
Continuing	Memory sizing error or Memory module not found

POST BIOS Beep Codes

Number of Beeps	Description
1	Success booting.
8	Display memory error (system video adapter)

4.3 Troubleshooting

Probable	Solution
1. There is no power in the system. Power LED does not shine; the fan of the power supply does not work 2. Indicator light on keyboard does not shine.	1. Make sure power cable is securely plugged in. 2. Replace cable. 3. Contact technical support.
System is inoperative. Keyboard lights are on, power indicator lights are lit, and hard drives are running.	Using even pressure on both ends of the DIMM, press down firmly until the module snaps into place.
System does not boot from a hard disk drive, but can be booted from optical drive.	1. Check cable running from disk to disk controller board. Make sure both ends are securely plugged in; check the drive type in the standard CMOS setup. 2. Backing up the hard drive is extremely important. All hard disks are capable of breaking down at any time.
System only boots from an optical drive. Hard disks can be read, applications can be used, but system fails to boot from a hard disk.	1. Back up data and applications files. 2. Reformat the hard drive. Re-install applications and data using backup disks.
Screen message shows “Invalid Configuration” or “CMOS Failure.”	Review system’s equipment. Make sure correct information is in setup.
System cannot boot after user installs a second hard drive.	1. Set master/slave jumpers correctly. 2. Run SETUP program and select correct drive types. Call the drive manufacturers for compatibility with other drives.

CPU Overheated

If the system shutdown automatically after power on system for seconds, that means the CPU protection function has been activated.

When the CPU is over heated, the motherboard will shutdown automatically to avoid a damage of the CPU, and the system may not power on again.

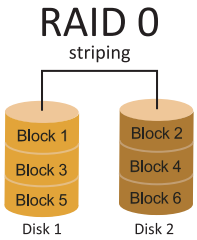
In this case, please double check:
1. The CPU cooler surface is placed evenly with the CPU surface.
2. CPU fan is rotated normally.
3. CPU fan speed is fulfilling with the CPU speed.

After confirmed, please follow steps below to relief the CPU protection function.
1. Remove the power cord from power supply for seconds.
2. Wait for seconds.
3. Plug in the power cord and boot up the system.

Or you can:
1. Clear the CMOS data. (See “Close CMOS Header: JCMOS1” section)
2. Wait for seconds.
3. Power on the system again.

4.4 RAID Functions

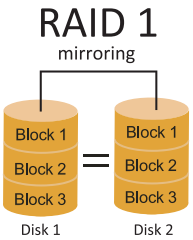
RAID Definitions



In a RAID 0 system data are split up in blocks that get written across all the drives in the array. By using multiple disks (at least 2) at the same time, this offers superior I/O performance. This performance can be enhanced further by using multiple controllers, ideally one controller per disk.

Features and Benefits

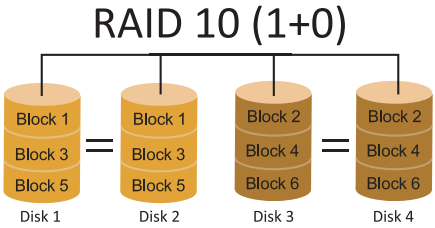
- Drives: Minimum 2, and maximum is up to 6 or 8. Depending on the platform.
- Uses: Intended for non-critical data requiring high data throughput, or any environment that does not require fault tolerance.
- Benefits: provides increased data throughput, especially for large files. No capacity loss penalty for parity.
- Drawbacks: Does not deliver any fault tolerance. If any drive in the array fails, all data is lost.
- Fault Tolerance: No.
- Total Capacity: (Minimal. HDD Capacity) x (Connected HDDs Amount)



Data are stored twice by writing them to both the data disk (or set of data disks) and a mirror disk (or set of disks) . If a disk fails, the controller uses either the data drive or the mirror drive for data recovery and continues operation. You need at least 2 disks for a RAID 1 array.

Features and Benefits

- Drives: Minimum 2, and maximum is 2.
- Uses: RAID 1 is ideal for small databases or any other application that requires fault tolerance and minimal capacity.
- Benefits: Provides 100% data redundancy. Should one drive fail, the controller switches to the other drive.
- Drawbacks: Requires 2 drives for the storage space of one drive. Performance is impaired during drive rebuilds.
- Fault Tolerance: Yes.



RAID 10 combines the advantages (and disadvantages) of RAID 0 and RAID 1 in one single system. It provides security by mirroring all data on a secondary set of disks (disk 3 and 4 in the drawing below) while using striping across each set of disks to speed up data transfers.

Features and Benefits

- Drives: Minimum 4, and maximum is 6 or 8, depending on the platform.
- Benefits: Optimizes for both fault tolerance and performance, allowing for automatic redundancy. May be simultaneously used with other RAID levels in an array, and allows for spare disks.
- Drawbacks: Requires twice the available disk space for data redundancy, the same as RAID level 1.
- Fault Tolerance: Yes.

4.5 AMD DUAL Graphics Technology

AMD Dual Graphics Technology Introduction

When user adds a PCIE display adapter, it can be integrated with IGD to show better performance. To make the two video devices work simultaneously and normally, please refer to the following setting.

AMD Dual Graphics Requirement

- Dual Graphics only supports with dual channel memory configuration
- Operating System: Windows 7 / Windows 8 / Windows 8.1
- Supported Dual Graphics Combinations:

Kaveri APUs			
AMD Radeon™ Graphics Card	A10-Series Radeon™ R7	A8-Series Radeon™ R7	A6-Series Radeon™ R5
"Oland" XT, R7 250	●(Note2)	●(Note2)	Under Investigation
"Oland" Pro 6CU, R7 240	●(Note2)	●(Note2)	
"Oland" Pro 5CU, R7 240	●(Note2)	●(Note2)	
"Oland" Pro 64b, R7 240	--	--	
Richland APUs			
AMD Radeon™ Graphics Card	A10-Series HD 8670D	A8-Series HD8570D	A6-Series HD 8470D
"Oland" XT, HD 8870	●	●	●(Note2)
"Oland" Pro, HD 8850	●	●	●
"Turks" XT, HD 6670	●	●	●
"Turks" Pro, HD 6570	●	●	●
"Caicos" Pro, HD 6450	●	●	●
Trinity APUs			
AMD Radeon™ Graphics Card	A10-Series HD 7660D	A8-Series HD7560D	A6-Series HD 7540D
"Turks" XT, HD 6670	●	●	--
"Turks" Pro, HD 6570	●	●	●
"Caicos" Pro, HD 6450	--	--	●

» ● *Recommended graphics cards for AMD dual-graphics*

Note

» *A4-Series CPUs do not support Dual Graphics.*

» *Only available for DDR3 graphics memory*

» *The information described above in this manual is for your reference only and the actual information and settings on board may be different from this manual. For further AMD Dual Graphics information, please visit the following website: http://www.amd.com*

APPENDIX I: Specifications in Other Languages

Arabic

المواصفات	
قاعدة وحدة المعالجة المركزية	المأخذ FM2+/FM2 لمعالج ايه إم دى AMD تسلسل A الحد الأقصى للطاقة الحرارية في تصميم المعالج (thermal design power – TDP): 100 واط. * يرجى الرجوع إلى الموقعwww.biostar.com.tw لقائمة دعم المعالج CPU.
مجموعة الشرائح	AMD A70M FCH
الذاكرة	تدعم قناة مزدوجة دي. دي. ار. 3DDR 800 / 1066 / 1333 / 1600 / 1866/ 2133 /(OC)2400 /(OC)2600 x2 دي. دي. ار. 3DDR فتحات الذاكرة المزدوجة DIMM، تتحمل كحد أقصى 32 جيجابايت ذاكرة كل فتحة مزدوجة DIMM تتحمل دون ECC 512 ميجا بايت /1/2/4/8/16 جيجابايت دي. دي. ار 3DDR * يرجى الرجوع إلى الموقعwww.biostar.com.tw لقائمة دعم الذاكرة.
التخزين	ايه إم دى AMD A70M FCH : وصلة x4 ساتا SATA 6 جيجا بايت / الثانية تتحمل رايد RAID 10 / 0 / 1 / AHCI
شبكة محلية LAN	ريياليتيك رت ل RTL 8111G, REALTEK 10 / 100 / 1000 ميجابايت / الثانية ، تحديد تلقائي ، النصف / القدرة القصوى المزدوجة
الترميز الصوتي	ALC662 5.1 قنوات عالية الدقة
ناقل متسلسل عام USB	يه إم دى FCH AMD A70M منافذ x 4 ناقل متسلسل عام USB 3.0 (2 في المداخل والمخارج الخلفية و 2 من خلال الموزع الداخلي) منافذ x 6 ناقل متسلسل عام USB 2.0 (2 في المداخل والمخارج الخلفية و 4 من خلال الموزع الداخلي)
فتحات التوسع	1 x فتحة منفذ الملحقات الإضافية PCI x1 فتحة منفذ الملحقات الإضافية PCIe x1 1 x فتحة منفذ الملحقات الإضافية PCIe 16 x3.0
المداخل والمخارج الخلفية	1 x PS/2 الفارة 1 x PS/2 لوحة المفاتيح للكمبيوت فتحة توصيل عدد 1 x واجهة مرنية رقمية DVI (A70MD PRO/A68MD PRO) فتحة توصيل عدد 1 x منظومة العرض المرني VGA فتحة لتوصيل عدد 1 x الشبكة المحلية LAN فتحة توصيل عدد 2 x ناقل متسلسل عام USB 3.0 فتحة توصيل عدد 2 x ناقل متسلسل عام USB 2.0 فتحة توصيل عدد 3 x جاك للصوت
المداخل والمخارج الداخلية	وصلة 4 x SATA 6 جيجابايت / الثانية موزع x2 ناقل متسلسل عام USB 2.0 (كل موزع يتحمل فتحتين ناقل متسلسل عام USB 2.0) موزع x1 ناقل متسلسل عام USB 3.0 (كل موزع يتحمل فتحتين ناقل متسلسل عام USB 3.0) موصلة للطاقة 1 x 4 دبابيس وصلة للطاقة x1 24 دبوس وصلة 1 x مروحة تبريد وحدة المعالجة المركزية وصلة 1 x مراوح تبريد المنظومة موزع 1 x اللوحة الأمامية موزع 1 x الصوت الأمامي موزع 1 x سيموس مباشر موزع 1 x فتحة تسلسلية
عامل الشكل	عامل شكل مدد التكنولوجيا المتقدمة microATX ، 226 مم x 174 مم
أنظمة التشغيل المدعومة	ويندوز إكس بي windows xp / ويندوز 7 / ويندوز 8 / ويندوز 8.1 / ويندوز 10 بيوستار BIOSTAR تحتفظ بحق إضافة أو أزلة الدعم لأي نظام تشغيل مع أو بدون أنظار.

German

Spezifikationen	
CPU-Unterstützung	Anschluss-FM2+/FM2 für AMD A-Serie Maximale CPU TDP (Thermal Design Power): 100 Watt * Bitte konsultieren Sie www.biostar.com.tw für CPU-Unterstützungsliste
Chipset	AMD A70M FCH
Festplattenspeicher	Unterstützt zweikanaliges DDR3 800/ 1066/ 1333/ 1600/ 1866/ 2133/ 2400(OC)/ 2600(OC) 2 x DDR3 DIMM-SpeicherSlot, Max. Uterstützung bis zu 32 GB-Speicher Jedes DIMM unterstützt nicht-ECC 512MB/ 1/ 2/ 4/ 8/ 16 GB DDR3-Module * Bitte konsultieren Sie www.biostar.com.tw für für Speicherunterstützung Liste.
Arbeitsspeicher	AMD A70M FCH: 4x SATA 6Gb-Verbindung Unterstützt RAID 0,1,10 & AHCI
LAN	Realtek RTL 8111G 10/ 100/ 1000 Mb Auto-Negotiation, Halb- / Voll-Duplex-fähig
Audio-Codec	ALC662 5.1 Kanäle, HD-Audio
USB	AMD A70M FCH: 4x USB 3.0-Port (2 hintere I/Os und 2 via interne Header) 6x USB 2.0-Port (2 hintere I/Os und 4 via interne Header)
Erweiterungsanschlüsse	1x PCI-Slot 1x PCIe x1-Slot 1x PCIe 3.0 x16-Slot
Hintere I/Os	1x PS/2-Maus 1x PS/2-Keyboard 1x DVI-Port (A70MD PRO/A68MD PRO) 1x VGA-Port 1x LAN-Port 2x USB 3.0-Port 2x USB 2.0-Port 3x Audio Jack
Interne I/Os	4x SATA 6.0Gb/s-Verbinung 2x USB 2.0-Header (jeder Header unterstützt 2 USB 2.0-Ports) 1x USB 3.0-Header (jeder Header unterstützt 2 USB 3.0-Ports) 1x 4-Pin-Stromverbindung 1x 24-Pin-Stromverbindung 1x CPU-Ventilatorverbindung 1x System-Ventilatorverbindung 1x Header für Frontpanel 1x Header für Frontaudio 1x Header für klares CMOS 1x Serieller Port-Header
Formfaktor	microATX Formfaktor, 226 mm x 174 mm
OS-Unterstützung	Windows XP/ 7/ 8/ 8.1/10 Biostar reserves the right to add or remove support for any OS with or without notice

Russian

Спецификации	
Поддержка центрального процессора	Сокет FM2+/FM2 для процессоров AMD серии A Максимальный термопакет центрального процессора (TDP): 100 ватт * Перечень поддержки центрального процессора смотрите на www.biostar.com.tw.
Набор микросхем	AMD A70M FCH
Память	Поддерживает двухканальный DDR3 800/ 1066/ 1333/ 1600/ 1866/ 2133/ 2400(OC)/ 2600(OC) 2 гнезда платы памяти DDR3 DIMM, максимальная память до 32 Гб Каждый модуль DIMM поддерживает модуль не-ECC 512 Мб/ 1/ 2/ 4/ 8/ 16 Гб DDR3 * Перечень поддержки памяти смотрите на www.biostar.com.tw.
Накопитель	AMD A70M FCH: Соединитель 4x SATA 6 Гб/с Поддерживает RAID 0,1,10 & AHCI
Локальная сеть	Realtek RTL 8111G Автосогласование 10/ 100/ 1000 Мб/с, работает в полно/полудуплексном режиме
Аудиокодек	ALC662 Каналы 5.1, высококачественное аудио
USB	AMD A70M FCH: 4 портов USB 3.0 (2 сзади ввода-вывода и 2 через внутренние контакты) 6 портов USB 2.0 (2 сзади ввода-вывода и 4 через внутренние контакты)
Гнезда расшир.	1x гнезда PCI 1x гнезда PCIe x1 1x PCIe 3.0 x16 гнездо
Задняя плата ввода-вывода	1 мышь PS/2 1 клавиатура PS/2 1 порт DVI (A70MD PRO/A68MD PRO) 1 порт VGA 1 порт локальной сети 2 порта USB 3.0 2 порта USB 2.0 3 гнезд для подключения наушников
Внутр. Плата ввода-вывода	Соединитель 4x SATA 6Гб/с 2 контакта USB 2.0 (каждый контакт поддерживает 2 порта USB 2.0) 1 контакта USB 3.0 (каждый контакт поддерживает 2 порта USB 3.0) 1 4-выводный разъем питания 1 24-выводный разъем питания 1 разъем вентилятора ЦП 1 разъема вентилятора системы 1 контакт передней панели 1 контакт передней аудиопанели 1 контакт микросхемы Clear CMOS 1 контакт последовательного порта
Конструктив	Форм-фактор microATX, 226 мм x 174 мм
Поддержка ОС	Windows XP/ 7/ 8/ 8.1/10 Biostar оставляет за собой право добавлять или удалять поддержку любой ОС, с уведомлением или без.

Spanish

Especificaciones	
Compatibilidad con el procesador	Ranura FM2+/FM2 para procesador AMD serie - A Alimentación de Proyección Térmica (TDP – Thermal Design Power): 100Watt *Por favor consultar con www.biostar.com.tw para la lista de compatibilidad con el procesador.
Tipo de Placa	AMD A70M FCH
Memoria	Soporta DDR3 800/ 1066/ 1333/ 1600/ 1866/ 2133/ 2400(OC)/ 2600(OC) Doble Canal 2x DDR3 DIMM Ranura de memoria Soporta hasta 32 GB Memoria Cada DIMM soporta un modulo non-ECC 512MB/ 1/ 2/ 4/ 8/ 16 GB DDR3 *Por favor consultar con www.biostar.com.tw para la lista de compatibilidad con el memoria.
Almacenamiento de información	AMD A70M FCH: Conector 4x SATA 6Gb/s Soporta RAID 0,1,10 & AHCI
LAN	Realtek RTL 8111G 10/ 100/ 1000 Mb/s auto negociación, capacidad dúplex Mitad/Completo
Códec Audio	ALC662 Canales Audio de Alta Definición 5.1
USB	Plataforma AMD A70M FCH: Ranura 4x USB 3.0 (2 en las entradas/salidas posteriores y 2 por los distribuidores internos) Ranura 6x USB 2.0 (2 en las entradas/salidas posteriores y 4 por los distribuidores internos)
Ranuras de Extinción	Ranura 1x PCI Ranura 1x PCIe x1 Ranura 1x PCIe 3.0 x16
Panel trasero de E/S	Ratón 1x PS/2 Teclado 1x PS/2 Ranura 1x DVI (A70MD PRO/A68MD PRO) Ranura 1x VGA Ranura 1x LAN Ranura 2x USB 3.0 Ranura 2x USB 2.0 Socket audio 3x
Conectores en placa	Conector 4x SATA 6Gb's Distribuidor 2x USB 2.0 (cada distribuidor soporta 2 ranuras USB 2.0) Distribuidor 1x USB 3.0 (cada distribuidor soporta 2 ranuras USB 3.0) Conector con 4 patillas x1 Conector con 24 patillas x1 Conector Ventilador procesador x1 Conector Ventilador Sistema x1 Distribuidor Panel Frontal x1 Distribuidor Audio Frontal x1 Distribuidor CMOS Directo x1 Distribuidor Ranura Serie x1
Factor de Forma	Factor de Forma microATX, 226 mm x 174 mm
Soporte OS	Windows XP/ 7/ 8/ 8.1/10 Biostar reserva su derecho de añadir o retirar el soporte para cada OS con o sin notificación.

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คุณสมบัติ	
ซีพียู	ซ็อกเก็ต FM2/FM2+ สำหรับโปเซสเซอร์ AMD A-series CPU TDP (Thermal Design Power) สูงสุด: 100Watt * เข้าชมได้ที่ www.biostar.com.tw สำหรับรายการซีพียูที่สนับสนุน
ชิพเซ็ต	AMD A70M FCH
หน่วยความจำ	สนับสนุน Dual Channel DDR3 800/ 1066/ 1333/ 1600/ 1866/ 2133(OC)/ 2400(OC) รองรับหน่วยความจำ 2 สล็อต DDR3 DIMM สูงสุดถึง 32 GB ทุก DIMM สนับสนุนโมดูล non-ECC 512MB/ 1/ 2/ 4/ 8/ 16 GB DDR3 * เข้าชมได้ที่ www.biostar.com.tw สำหรับรายการหน่วยความจำที่สนับสนุน
สตอเรจ	AMD A70M FCH: 4x SATA 6Gb/s พอร์ตเชื่อมต่อ สนับสนุน RAID 0,1,10 & AHCI
แลน	Realtek RTL 8111G 10/ 100/ 1000 Mb/s การเจรจาอัตโนมัติ, ความสามารถในการเพล็กซ์ Half / Full
ออดิโอ โคเดก	ALC662 5.1 Channels, High Definition Audio
ยูเอสบี	AMD A70M FCH: 4x USB 3.0 พอร์ต (2 พอร์ตด้านหลัง I/O และ 2 พอร์ต ผ่านพอร์ตเชื่อมต่อด้านใน) 6x USB 2.0 พอร์ต (2 พอร์ตด้านหลัง I/O และ 4 พอร์ต ผ่านพอร์ตเชื่อมต่อภายใน)
สล็อตขยายเพิ่มเติม	1x PCI สล็อต 1x PCIe 2.0 x1 สล็อต 1x PCIe 3.0 x16 สล็อต
พอร์ต I/O ด้านหลัง	1x PS/2 เมาส์ 1x PS/2 คีย์บอร์ด 1x DVI-D พอร์ต (A70MD PRO/A68MD PRO) 1x VGA พอร์ต 1x LAN พอร์ต 2x USB 2.0 พอร์ต 2x USB 3.0 พอร์ต 3x Audio Jack
พอร์ต I/O ด้านใน	4x SATA III พอร์ตเชื่อมต่อ 2x USB 2.0 พอร์ตเชื่อมต่อ (หัวเชื่อมต่อทุกตัวรองรับ 2 พอร์ต USB 2.0) 1x USB 3.0 พอร์ตเชื่อมต่อ (หัวเชื่อมต่อทุกตัวรองรับ 2 พอร์ต USB 3.0) 1x 4-Pin Power พอร์ตเชื่อมต่อ 1x 24-Pin Power พอร์ตเชื่อมต่อ 1x พอร์ตเชื่อมต่อ CPU Fan 1x พอร์ตเชื่อมต่อระบบ Fan 1x พอร์ตเชื่อมแต่แผงด้านหน้า 1x พอร์ตเชื่อมต่อออดิโอด้านหน้า 1x พอร์ต Clear CMOS 1x พอร์ตเชื่อมต่อ Serial Port
รูปแบบจากโรงงาน	ขนาน uATX จากโรงงาน, 226มม. x 174มม.
สนับสนุน OS	Windows XP/ 7/ 8/ 8.1/10 Biostar ขอสงวนสิทธิ์ในการเพิ่มหรือถอดการสนับสนุนสำหรับระบบปฏิบัติการ OS ต่างๆ โดยไม่ต้องแจ้งให้ทราบล่วงหน้า