Optimate 6 manual



Document MSI MotherboardSafety InformationThe components included in this package are prone to damage from electrostatic discharge (ESD). Please adhere to the following instructions to ensure successful computer assembly. Ensure that all components are securely connected. component or fail to start. Hold the motherboard by the edges to avoid touching sensitive components. It is recommended to wear an electrostatic discharge (ESD) wrist strap is not available, discharge yourself of static electricity by touching another metal object before handling the motherboard. Store the motherboard is not installed. Before turning on the computer, ensure that there are no loose screws or metal components on the motherboard or anywhere within the computer case. Do not boot the computer before installation is completed. This could cause permanent damage to the components as well as injury to the user. If you need help during any installation step, please consult a certified computer technician. Always turn off the power supply and unplug the p user guide for future reference. Keep this motherboard away from humidity. Make sure that your electrical outlet provides the same voltage as is indicated on the PSU to the electrical outlet. Place the power cord such a way that people can not step on it. Do not place anything over the power cord. All cautions and warnings on the motherboard should be noted. If any of the following situations arises, get the motherboard has been dropped and damaged. The motherboard has obvious sign of breakage. Do not leave this motherboard in an environment above 60°C (140°F), it may damage the motherboard. Specifications CPUSupports 10th Gen Intel® Core[™] Processors, 11th Gen Intel® Core[™] Processors, Pentium® Gold and Celeron® Processors processor socket LGA1200* Please go to intel.com for compatibility information.ChipsetIntel® H510/ B560 chipset Memory2x DDR4 memory slots, supports 1R 2133/ 2666/ 2933 MHz for 10th Gen Intel® CPU (by JEDEC & POR)Max overclocking frequency (For B560M PRO-E/ PLUS/ B560M-X):1DPC 1R Max speed up to 4800 MHz1DPC 2R Max speed up to 4600+ MHzSupports Intel® Extreme Memory Profile (XMP)* Please refer to www.msi.com for more information on compatible memory. Expansion Slots1x PCIe x16 slot (From CPU)Support up to PCIe 4.0 for 11th Gen Intel® CPUSupport up to PCIe 3.0 for 10th Gen Intel® CPU1x PCIe 3.0 x1 slot (From PCH)1x M.2 slot with E key for WiFi module only(M2 2) (For H510M BOMBER) Onboard Graphics1x HDMI 2.0b with HDR port, supports a maximum resolution of 4K 60Hz*/**1x VGA port, supports a maximum resolution of 2048×1536 60Hz, 1920×1200 60Hz (For H510M PRO/ H installed.AudioRealtek® ALC897 Codec 7.1-Channel High Definition AudioLAN1x Intel® I219V 1Gbps LAN controller Storage4x SATA 6Gb/s ports (From H510/ B560 Chipset)1x M.2 slot (Key M) (For H510M PRO/ x4Supports 2242/ 2260/ 2280 storage devices* SATA4 will be unavailable when installing M.2 SATA SSD in the M2_1 slot.USBIntel® H510/ B560 Chipset4x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 2.0 ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel, 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel), 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel), 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel), 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel), 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel), 2 ports available through the internal USB connector)6x USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the back panel), 2 ports available through the internal USB 3.2 Gen 1 5Gbps ports (2 Type-A ports on the available through the internal USB 2.0 connector1x 8-pin ATX main power connector1x 8-pin ATX main power connector1x 4-pin CPU fan connector1x 4-pin system fan connector1x front panel audio connector2x system panel connectors1x serial port connector1x Clear CMOS jumper1x TPM module connectors1x PS/2 keyboard/ mouse combo port1x VGA port (For H510M PRO/ H510M-A PRO/ H510M BOMBER/ B560M PRO-E/ B560M PLUS)1x DisplayPort (For H510M PRO)1x HDMI port4x USB 2.0 ports2x USB 3.2 Gen 1 5Gbps Type-A ports1x LAN(RJ45) port3x audio jacksLED Feature4x EZ Debug LED1x 4-pin RGB LED connector (For H510M PRO)1x 3-pin RAINBOW temperature detectionCPU/System fan speed detectionCPU/System fan speed controlForm Factor9.29 x 7.95 in. (23.6 cm x 20.2 cm)BIOS Features1x 256 Mb flashUEFI AMI BIOSACPI 6.2, SMBIOS 3.0Multi-languageSoftwareMSI CenterIntel Extreme Tuning UtilityCPU-Z MSI GAMINGGoogle Chrome[™], Google Toolbar, Google DriveNorton¹¹ Internet Security SolutionMSI Center FeaturesLAN ManagerMystic Light Extension (RGB) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User ScenarioHardware MonitorFrozr AI CoolingLEDMystic Light Extension (RAINBOW) (For H510M PRO)User Scena PRO)Mystic light SYNC (For H510M PRO)EZ LED Control (For H510M PRO)EZ DEBUG LEDPerformanceLightning Gen 4 PCI-E SlotDDR4 BoostCore Boost2oz Copper thickened PCBProtectionExperienceMSI CenterFrozr AI CoolingClick BIOS 5CPU Cooler TuningRear I/O PanelLAN Port LED Status TableAudio 7.1-channel ConfigurationTo configure 7.1-channel audio, you have to connect front audio I/O module to JAUD1 connector and follow the below steps. Click on the Realtek HD Audio Manager > Advanced Settings to open the dialog below. Select Mute the rear output device, when a front headphone plugged in. Plug your speakers to audio jacks on rear and front I/O panel. When you plug into a device at an audio jack, a dialogue window will pop up asking you which device is current connected. Overview of Components* Distance from the center of the CPU into the center of th removing the CPU. Please retain the CPU protective cap after installing the processor. MSI will deal with Return Merchandise Authorization (RMA) requests if only the motherboard comes with the protective cap on the CPU socket. When installing a CPU, always remember to install a CPU heatsink. A CPU heatsink is necessary to prevent overheating and maintain system stability. Confirm that the CPU heatsink has formed a tight seal with the CPU before booting your system. Overheating can seriously damage the CPU and motherboard. Always make sure the cooling fans work properly to protect the CPU from overheating. Be sure to apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation. Whenever the CPU is not installed, always protect the CPU socket pins by covering the socket with the plastic cap. If you purchased a separate CPU and heatsink/ cooler, Please refer to the documentation in the heatsink/ cooler package for more details about installation. DIMM SlotsPlease install the memory module into the DIMM slot as shown below. Important to ensure system stability for Dual channel mode, memory modules must be of the same type, number and density. Some memory modules must be of the same type, number and density. Presence Detect (SPD). Go to BIOS and find the DRAM Frequency if you want to operate the memory at the memory cooling system for full DIMMs installation or overclocking. The stability and compatibility of installed memory module depend on installed CPU and devices when overclocking.Please refer to www.msi.com for more information on compatible memory.M2 1: M.2 Slot (Key M)Please install the M.2 Slot (Key M)Please install the M.2 Slot (Key E)Please install the Wi-Fi module into M.2 2 slot as shown below.PCI E1~2: PCIe Expansion SlotsImportantWhen adding or removing expansion cards, always turn off the power supply and unplug the power cable from the power outlet. Read the expansion card's documentation to check for any necessary additional hardware or software changes. If you install a large and heavy graphics card, you need to use a tool such as MSI Gaming Series Graphics Card Bolster to support its weight to prevent deformation of the slot.SATA1~4: SATA 6Gb/s Connectors These connectors are SATA 6Gb/s interface ports. Each connector can connect to one SATA device.ImportantPlease do not fold the SATA cables have identical plugs on either sides of the cable. However, it is recommended that the flat connector be connected to the motherboard for space saving purposes.SATA1 will be unavailable when installing M.2 SATA SSD in the M2 1 slot.JAUD1: Front Audio Connector This connector addio jacks on the front panel.JFP1, JFP2: Front Panel Connectors These connectors and LEDs on the front panel.ATX PWR1, CPU_PWR1: Power cables are securely connected to a proper ATX power supply. ImportantMake sure that all the power cables are securely connectors allow you to connect on ATX power supply. ConnectorThis connector allows you to connect USB 2.0 ports on the front panel.ImportantNote that the VCC and Ground pins must be connectorThis connector allows you to connect USB 3.2 Gen 1 5Gbps ports on the front panel.ImportantNote that the Power and Ground pins must be connectors provide constant 12V output and adjust fan speed with speed control signal. When you plug a 3-pin (Non-PWM) fan to a fan connector in PWM mode, the fan speed will always maintain at 100%, which might create a lot of noise.ConnectorDefault fan modeMax. currentMax. powerCPU FAN1PWM mode2A24WSYS FAN1DC mode1A12WImportantYou can adjust fan speed in BIOS > Hardware Monitor.JTPM1: TPM Module ConnectorThis connector is for TPM (Trusted Platform Module). Please refer to the TPM security platform manual for more details and usages. JCI1: Chassis Intrusion Switch cable. Using Chassis Intrusion Connector This connector to the chassis intrusion Switch cable. Using Chassis Intrusion Switch cable. BIOS > Security > Chassis Intrusion Configuration.Set Chassis Intrusion to Enabled.Press F10 to save and exit and then press the Enter key to select Yes.Once the chassis Intrusion WarningGo to BIOS > Security > Chassis Intrusion Configuration.Set Chassis Intrusion to Reset.Press F10 to save and exit and then press the Enter key to select Yes.JCOM1: Serial Port ConnectorThis connector allows you to connect the optional serial port with bracket.JBAT1: Clear CMOS (Reset BIOS) JumperThere is CMOS memory onboard that is external powered from a battery located on the motherboard to save system configuration data. If you want to clear the system configuration, set the jumpers to clear the computer and unplug the power cord and power on the computer.EZ Debug LEDThese LEDs indicates GPU is not detected or fail.DRAM - indicates GPU is not detected or fail.BOOT - indicates GPU is not latest utilities and drivers at www.msi.comInstalling Windows ® 10 installation disc/USB into your computer POST (Power-On Self Test) to get into Boot Menu.Select the Windows ® 10 installation disc/USB from the Boot Menu.Press any key when screen shows Press any key to boot from CD or DVD... message.Follow the instructions on the screen to install Windows ® 10.Installing DriversStart up your computer in Windows® 10.Insert MSI® Drive disc into the optical drive.Click the Select to choose what happens with this disc pop-up notification, then select Run DVDSetup.exe to open the installer. If you turn off the AutoPlay feature from the Windows Control Panel, you can still manually execute the DVDSetup.exe from the root path of the MSI Drive disc. The installer will find and list all necessary drivers in the Drivers/Software tab. Click the Install button in the lower-right corner of the window. The drivers installation will then be in progress, after it has finished it will prompt you to restart. Click OK button to finish. Restart your computer. MSI Center MSI Center is an application that helps you easily optimize game settings and smoothly use content creation softwares. It also allows you to control and synchronize LED light effects on PCs and other MSI products. With MSI Center, you can customize ideal modes, monitor system performance, and adjust fan speed.MSI Center User Guidelf you would like to know more information about MSI Center, please refer to or scan the QR code to access. Important Functions may vary depending on the product you have. UEFI BIOS is compatible. with UEFI (Unified Extensible Firmware Interface) architecture. UEFI has many new functions and advantages that traditional BIOS cannot achieve, and it will completely replace BIOS in the future. The MSI UEFI as the default boot mode to take full advantages that traditional BIOS cannot achieve and it will completely replace BIOS in the future. guide refers to UEFI BIOS unless otherwise noted. UEFI AdvantagesFast booting - UEFI can directly boot the operating system and save the BIOS self-test process. And also eliminates the time to switch to CSM mode during POST. Supports for hard drive partitions with a GUID Partition Table (GPT). Supports unlimited number of partitions. Supports full capabilities of new devices - new devices may not provide backward compatibility. Supports with the startup process. Incompatible UEFI Cases 32-bit Windows operating system - this motherboard supports only 64-bit Windows 10 operating system. Older graphics card - the system will detect your graphics card. When display a warning message There is no GOP (Graphics card or using integrated graphics from CPU for having normal function. How to check the BIOS mode? Power on your computer. Press Delete key, when the Press DEL key to enter Setup Menu, F11 to enter Boot Menu message appears on the screen. BIOS SetupThe default settings offer the optimal performance for system stability in normal conditions. You should always keep the default settings to avoid possible system damage or failure booting unless you are familiar with BIOS. Important BIOS items are continuously update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be for reference only. You could also refer to the HELP information panel for BIOS screens, options and settings will vary depending on your system. Entering BIOS setupPress Delete key, when the Press DEL key to enter Setup Menu, F11 to enter Boot Menu message appears on the screen during the boot process.Function keyF1: General HelpF2: Add/ Remove a favorite itemF3: Enter Favorites menuF4: Enter CPU Specifications menuF5: Enter Memory-Z menuF6: Load optimized defaultsF7: Switch between Advanced mode and EZ modeF8: Load Overclocking ProfileF9: Save Overclocking ProfileF10: Save Change and Reset*F12: Take a screenshot and save it to USB flash drive (FAT/ FAT32 format only).Ctrl+F: Enter Search page* When you press F10, a confirmation. Select between Yes or No to confirm your choice.BIOS User GuideIf you'd like to know more instructions on setting up the BIOS, please refer to or scan the QR code to access. Resetting BIOSYou might need to restore the default BIOS and press F6 to load optimized defaults. Short the Clear CMOS jumper on the motherboard. Important Be sure the computer is off before clearing CMOS data. Please refer to the Clear CMOS jumper/ button section for resetting BIOS.Updating BIOS.Updating BIOS.Updating BIOS with M-FLASHBefore update file into the USB flash drive.Updating BIOS.Insert the USB flash drive that contains the update file into the USB port.Please refer the following methods to enter flash mode.Reboot and press Ctrl + F5 key during POST and click on Yes to reboot the system. Select a BIOS file to perform the BIOS update process. When prompted click on Yes to start recovering BIOS.After the flashing process is 100% completed, the system will reboot automatically.Updating the BIOS installed and the internet connection is set properly.Please close all other application software before updating the BIOS. To update BIOS. Install and launch MSI Center and go to Support page.Select Live Update and click on Advance button.Select the BIOS file and click on Install button on it. The system will automatically restart to update BIOS.After the flashing process is 100% completed, the system will restart automatically.FAQ'SIs this motherboard compatible with my CPU?Please refer to the specification page for the motherboard to check if your CPU is supported. Does this motherboard ?Please refer to the user manual for your CPU for installation instructions. How many USB 2.0 ports are there on this motherboard? There are 4 SATA ports on this motherboard? There are 6 USB 2.0 ports on this motherboard? There are 6 USB 3.0 ports on is the most powerful motherboard for gaming? The Best AMD Gaming Motherboards: X570(S), B550, TRX40, X470 and B450. AMD's current flagship X570/X570S chipset brings with it full support for PCIe 4.0, including devices connected to both its CPU-integrated and chipset-based PCIe controllers, and the transfer rate between the CPU and chipset is likewise doubled. Do motherboards matter for gaming? Motherboards do not directly influence your gaming performance at all. What your motherboard type will do, is allow your graphics card and processor to perform better (or worse). It's sort of similar to a Solid State Drive's impact on FPSWhat is the most powerful motherboard for gaming? The Best AMD Gaming Motherboards: X570(S), B550, TRX40, X470 and B450. AMD's current flagship X570/X570S chipset brings with it full support for PCIe 4.0, including devices connected to both its CPU-integrated and chipset-based PCIe controllers, and the transfer rate between the CPU and chipset is likewise doubled. What makes a computer fast? Having a processor with more cores and a higher clock speed means that you can interact with more applications, more quickly. Good ratings in these fields are what makes your computer faster. For the most rigorous routines, whether it's gaming or video editing, 4.0 GHz is a good baseline for processor speed. What RAM is compatible with MSI motherboard?The minimum memory configuration is usually 8GB on most of MSI Desktop (DT). 8GB memory size is good for common usage. How do I setup my Msi Gaming pc?You can physically confirm that they are seated correctly by giving them a good push plug in the power cable to the back of your power supply. Some systems have a power switch that needs to be turned.MSI Motherboard/B560M-A-PRODocuments / ResourcesMSI MSI Motherboard [pdf] User ManualMSI, H510M PRO, H510M BOMBER, B560M PRO-E, B560M PLUS, B560M-X, MotherboardReferences