

AMD FX™ Series Processors

User Guide

AMD FX™ Processors unlock maximum, unrestrained processing performance for extreme responsiveness you can see and feel.

Maximum Performance

- The industry's first 8-core desktop processor
- Overclock with easy to use [AMD Overdrive™ technology](#)⁴
- Supreme power available from virtually every core configuration – also available in 6- and 4-core variants
- Aggressive performance for mega-tasking and intensive applications like video editing and 3D modeling

Innovative Architecture

- The industry's first native 8-core desktop processor for unmatched multitasking and pure core performance with "Bulldozer" architecture
- Can deliver the performance you need without raising power requirements

An Industry Leader in Price for the Performance

- Unlocked processors allow the maximum in tunable performance⁴
- [AMD Turbo Core technology](#)⁵ dynamically adjusts performance to give you the best experience, no matter what you are doing
- Get superior performance at a competitive price with unlocked technology

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Introduction

Before selecting a driver, first consider your circumstance and determine if you need to install, reinstall, or update the driver. Steps to install the display driver will vary depending on the circumstances.

Here are some reasons to **install** or **reinstall** a display driver:

- New install or upgrade of the operating system
- Resolve display issues or error messages that may be related to missing/corrupt files associated with the driver

Here are some reasons to **update** an existing display driver:

- Confirm compatibility and functionality with a newly installed graphics card
- Support a newly installed software i.e.; 3D games, design/productivity applications, and plug-ins
- Obtain bug fixes, new features, and performance improvements.

NOTE: Updating the graphics driver is not required even though a newer version is available. If there are no issues with the performance of your system, software, and graphics hardware, then updating the graphics driver is not recommended.

Now that the reasons to install/reinstall or update a graphics driver have been covered. Let us explore the available methods for locating a compatible driver on the AMD website and understand when and why to use each method.

Locating a Driver

There are currently two methods for locating a compatible graphics driver, both will be covered in more detail below, they are:

1. [AMD Driver Autodetect Tool](#)
2. [AMD Driver Download Page](#)

NOTE: AMD also provides drivers for other non-graphics products it designs such as: RAID, motherboard chipsets, and audio. Although drivers for these products are available for download from the AMD website, the installation and configuration support is provided by the system vendor or motherboard manufacturer. For a list of AMD Partners and their corresponding websites, refer to KB article: [GPU 91](#)

AMD Driver Autodetect Tool

The Autodetect tool is a small application that does not need to be installed. It is the recommended method for installing or updating the graphics driver. The tool is designed to provide only the latest official AMD Catalyst™ graphics driver.

The tool is designed to detect the model of the AMD graphics card and the version of the Microsoft® Windows operating system installed in your computer. If a new driver is available, the tool is designed to help you download it. After a successful download of the driver, the tool will provide you an option to install it.

If your system is not running Microsoft Windows or you are looking for an earlier driver or the latest beta driver, you can manually search for it on the AMD Driver Download page. Information on how to use the AMD Driver Download page is covered in the next section of this article.

To access more information about using the Autodetect tool and the link to download it, visit the [AMD Driver Autodetect Tool page](#).

NOTE: If the Autodetect tool doesn't locate a matching driver for your AMD graphics card and/or operating system, it could be that a driver is not available due to compatibility issues. The graphics hardware does not meet all the requirements of the operating system or vice versa. Another possible reason is that the graphics hardware or operating system has reached end of life and support has been discontinued. More information can be found in the following KB article: [GPU 125](#)

AMD Driver Download Page

If a driver is not found using the first method, you have an option to search for a compatible driver using the selector menu on AMD's driver download page. The driver selector menu allows you to specify your AMD graphics product, model, and operating system to search for the latest compatible driver. If a matching driver is found, it will take you the driver download page containing information about the driver, release notes, and the file download link.

This method is effective only if you know your AMD graphics product, model, and operating system. If you know your graphics product, model, and operating system and would like to learn how to use the driver selector menu to locate a matching driver, please follow the guide: [How to find the latest drivers for an AMD graphics card](#)

To proceed directly to the AMD Driver Download page, visit: www.amd.com/drivers

If you are unsure of your AMD graphics product, model, and/or operating system, the section below will explain how that information can be obtained and selected from the driver download page.

First let's understand the different types of AMD graphics products in its lineup. Choose your graphics product and the system it's used in from the list below:

- **APU (Accelerated Processing Unit):** These are processors that combine the CPU and the graphics processor (GPU) on a single chip. APUs are commonly used in desktop PCs, mobile notebooks, and workstation systems. The AMD A-Series APU is an example.
- **Desktop Graphics:** This technology is commonly used in home desktop PCs. The AMD Radeon™ HD series graphics cards are examples.

- **Notebook Graphics:** This technology is typically used in notebooks/laptops. The AMD Mobility Radeon™ HD series graphics cards are examples.
- **TV Tuner Products:** This refers to devices that allow desktop computers and notebooks to receive live broadcast video and HDTV content. AMD TV Wonder™ 750 series tuner cards are examples.
- **Workstation Graphics:** Workstation graphics technology is commonly found in computers used for business purposes. They are designed for use in the Computer Aided Design (CAD), Digital Content Creation (DCC) and simulation markets. AMD FirePro™ series graphics cards is an example.
- **Integrated Motherboard Graphics:** These graphics components are integrated into the motherboard of a computer system. The AMD Radeon™ HD4290 series graphics cards are examples.
- **Embedded Graphics:** This graphics technology is found in products built to deliver the high performance of desktop graphics for embedded applications often found in smaller form or thin clients. AMD 785E and AMD 780E graphics processors are examples.
- **MAC Graphics:** These are graphics products used in MAC computers. Apple Boot Camp drivers can be found in this product category.

The next selections on the menu are the graphics family and model. If you're unsure of the exact AMD graphics product you have, you can find it by reviewing the KB article: [How-To Identify the Manufacturer and Model of an AMD Graphics Card](#).

The last selection on the menu selection is the operating system. You must specify the operating system and version in order to search for a matching driver. To determine your Microsoft® Windows operating system version, take a look at Microsoft's KB article: [Which Windows operating system am I running?](#)

After you obtain the information about your AMD graphics product, for step by step instructions on how to use the driver selector menu to locate a matching driver, please refer to: [How to find the latest drivers for an AMD graphics card](#)

NOTE: If you are unable to find a driver by selecting your combination of AMD graphics product and operating system from the menu, it may be due to compatibility issues, such as the graphics hardware not meeting all the requirements of the operating system or vice versa. Another possible reason is that the graphics hardware or operating system has reached end of life and support has been discontinued. More information can be found in the following KB article: [GPU 125](#)

Installing, Reinstalling, or Updating the AMD Catalyst™ Driver

This section provides information on how to install, reinstall, or update the AMD Catalyst™ graphics driver and best practice procedures to consider when performing these actions.

Installing or updating a new driver:

For systems running Windows operating system, a driver install or update requires that the operating system is up to date with the latest service pack and Microsoft® .Net Framework. To check whether your Windows is up to date and the latest Microsoft.Net Framework is installed, please visit the Microsoft online article about [Windows Update](#).

Once you have determined that the operating system is up to date, you may proceed with installing or updating the driver. This can be done by simply double clicking the executable file.

Instructions for installing AMD Catalyst™ drivers on a Windows-based system can be found in the article: [How-To Install AMD Catalyst™ Drivers For A Windows® Based System](#)

NOTE: Users with systems running any version of Windows XP and Vista MUST uninstall the existing driver before reinstalling or updating the driver. For instructions on how to uninstall an existing AMD Catalyst™ graphics driver on a Windows based system, follow this guide: [How-To Uninstall AMD Catalyst™ Drivers From A Windows® Based System](#).

Reinstalling an existing driver:

To troubleshoot driver related issues by reinstalling the existing driver, it is recommended to **ALWAYS** uninstall the problematic driver first. However, before beginning the uninstall process it is recommended to ensure that Windows is up to date.

To check whether your Windows is up to date and the latest Microsoft® .Net Framework is installed, please visit the Microsoft online article about [Windows Update](#).

If Windows and its components are up to date, next proceed with uninstalling the graphics driver. For instructions on how to uninstall an existing AMD Catalyst™ graphics driver on a Windows based system, follow the guide: [How-To Uninstall AMD Catalyst™ Drivers From A Windows® Based System](#).

After the problematic driver has been uninstalled the driver package may be reinstalled. Instructions for installing AMD Catalyst™ drivers on Windows based system can be found in the article: [How-To Install AMD Catalyst™ Drivers For A Windows® Based System](#)

How-To Debug Driver Installation Problems

This last section covers potential issues that may cause the driver installation to fail and troubleshooting steps to resolve the install problems.

Driver installation failures may be caused by the following:

- The system not meeting the requirements of the graphics hardware and/or driver

- An outdated operating system or a missing required component such as the Microsoft® .Net Framework
- A corrupt system registry and existing driver files
- A background application such as antivirus preventing the driver installation

If the driver installation encounters a problem or an error preventing the process to complete, or the driver fails to load after installation, then it is recommended to perform the steps below:

- Ensure the system meets the requirements for the graphics hardware and/or driver
 - Requirements for AMD graphics products can be found on the [AMD Product Page](#)
 - Requirements for AMD Catalyst™ graphics drivers can be found in the release notes located on the driver download page
- Perform all available updates to the operating system
 - For Windows visit: [Windows Update](#)
- Use a third party cleaning tool (e.g. Driver Sweeper or CC Cleaner) to remove any remaining AMD graphics driver entries, affected registry entries, and corrupted files prior to installation of the AMD Catalyst™ driver. For support using these tools, please contact the respective software company that provides them.
- Temporarily disable the antivirus until the graphics driver has been successfully installed

These troubleshooting steps can resolve most driver installation problems. If the steps suggested did not fix your driver installation issue, check the [AMD Graphics Drivers and Software Download and Installation FAQ](#).

Additional information resources can be found searching:

- [AMD Support and Game Forums](#)
- [Top driver issues knowledgebase](#)
- AMD Catalyst™ driver release notes (located on the driver download page)

AMD FX™ Processors

Experience unmatched multitasking and pure core performance with the industry's first 8-core desktop processor, unlocked for your overclocking pleasure.¹ Push your core frequencies to the limit for the speed you crave with [AMD Turbo Core technology](#).⁵ Go beyond the limits of flat-out speed with easy-to-use [AMD OverDrive™ technology](#). Get all this impressive performance at an unbelievable price.

AMD FX™ 8-Core Processors

The industry's first native 8-core desktop processor for unmatched multitasking and pure core performance with "Bulldozer" architecture.

Features and Benefits

Each AMD FX™ Processor in a box comes with:

- A high-performance AMD processor
- AMD-qualified heat sink and fan with thermal interface
- Installation manual
- AMD processor case sticker
- Certificate of authenticity
- Three-year limited warranty

AMD PIB Package Benefits

- Each PIB is bar-coded for scanning and data tracking.
- Tamper-resistant packaging helps ensure processor authenticity.
- ***Featuring a 220 Watt TDP, the AMD FX™ 9000 Series processors have special system requirements including a robust liquid cooling system. For more information, see the [AMD FX™ 9000 Series system requirements page](#).**

AMD64 Technology	Yes
Simultaneous 32- & 64-bit computing	Yes
L1 Cache (Instruction + Data) per core	128KB (64KB + 64KB)
L2 Cache (1MB per core)	8MB or 6MB or 4MB
L3 Cache	8MB (shared L3)
HyperTransport™ Technology	HyperTransport™ Technology up to 4000MT/s full duplex, or up to 16.0GB/s I/O Bandwidth
Integrated DDR3 Memory Controller	Yes
Memory Controller Width	128-bit
Type of Memory Supported	Up to DDR3 1866
Memory Bandwidth	Up to 21 GB/s dual channel memory bandwidth
Total Processor-to-system Bandwidth (HyperTransport plus memory bandwidth)	Up to 37 GB/s
Process Technology	32 nanometer, SOI (silicon-on-insulator) Technology
Packaging	AM3+
Thermal Design Power	220W, 125W, & 95W
Manufacturing Sites	GLOBALFOUNDRIES Dresden, Germany

How-To Identify the Manufacturer and Model of an AMD Graphics Card

This article provides instructions on how to identify the model and manufacturer of an AMD graphics card, which may help with troubleshooting a technical issue, locating the appropriate graphics drivers, or validating a warranty submission.

For systems with the graphics driver already installed, there are two methods that the model of an AMD graphics card can be found:

1. [Using the AMD Radeon Settings](#)
2. [Using the AMD Catalyst™ Control Center](#)
3. [Using the Device Manager](#)

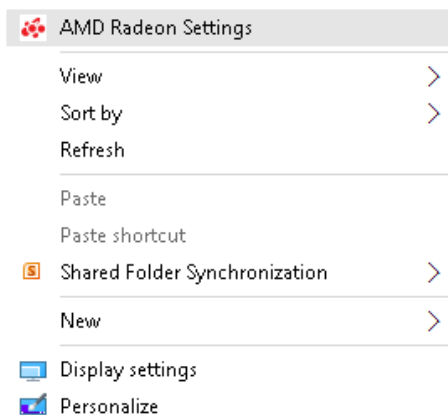
To identify the *manufacturer* and model of an AMD graphics card, the following methods can be used:

1. [By physical inspection](#)
2. [Using the Subsystem Vendor ID and Device ID of the graphics card](#)

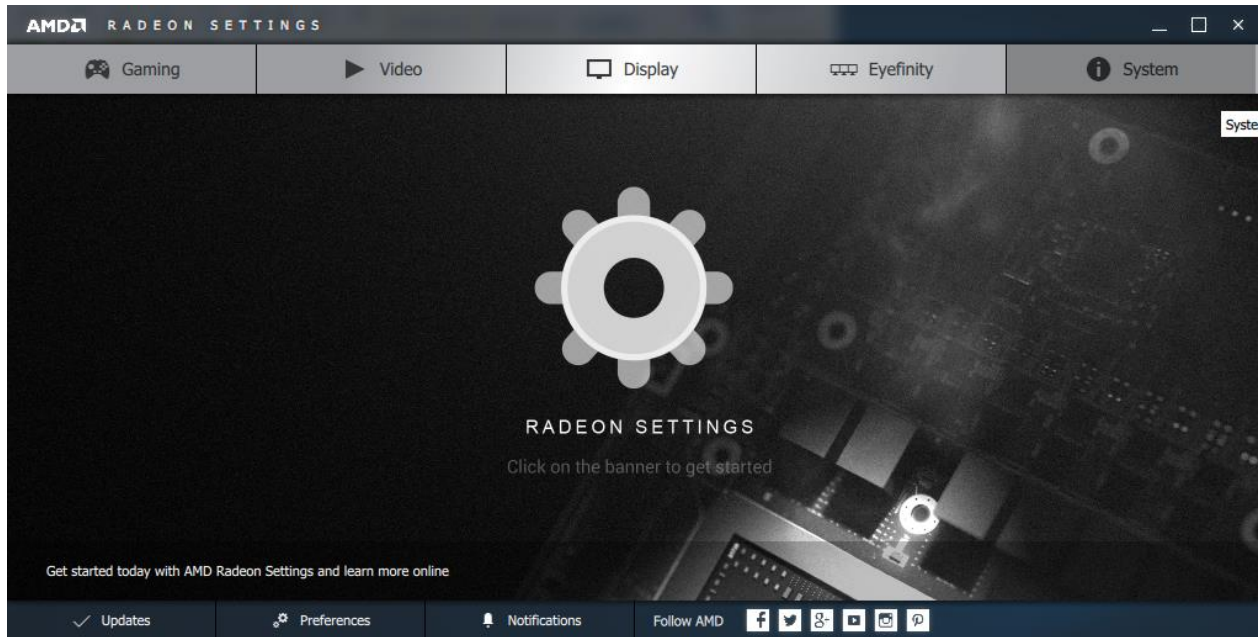
Using the AMD Radeon Settings:

Provided that the graphics drivers are correctly installed and functioning, the model of the graphics card may be found using the AMD Radeon Settings.

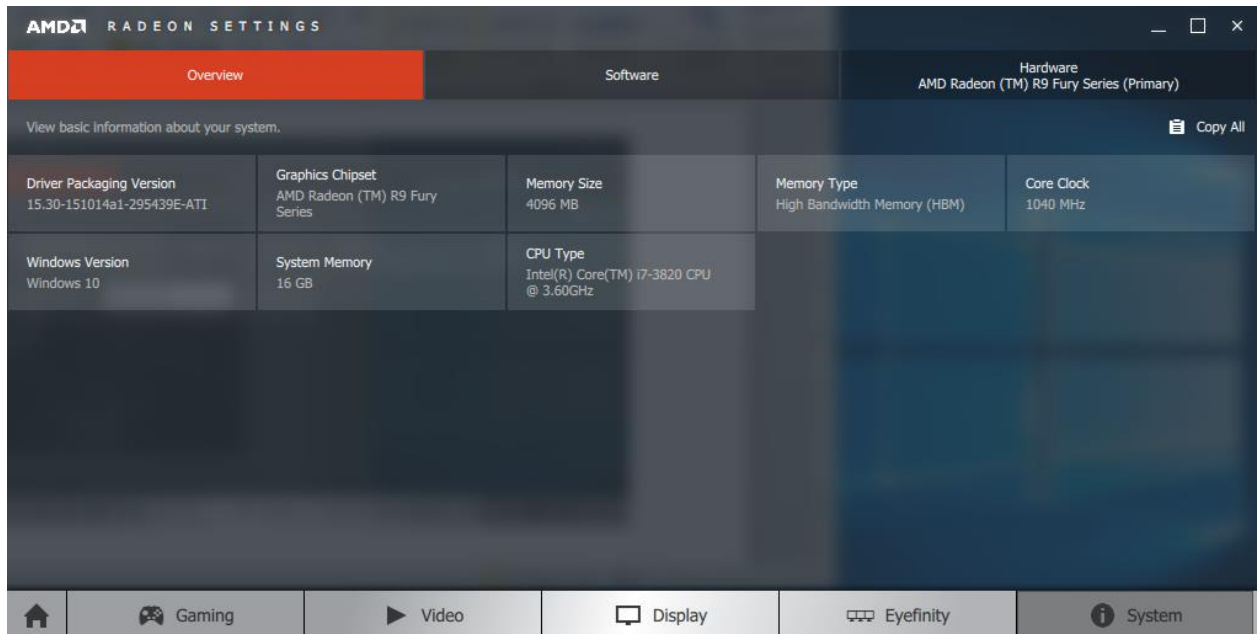
- Open the AMD Radeon Settings by Right-clicking on any empty space on the desktop. From the menu select **AMD Radeon Settings**.



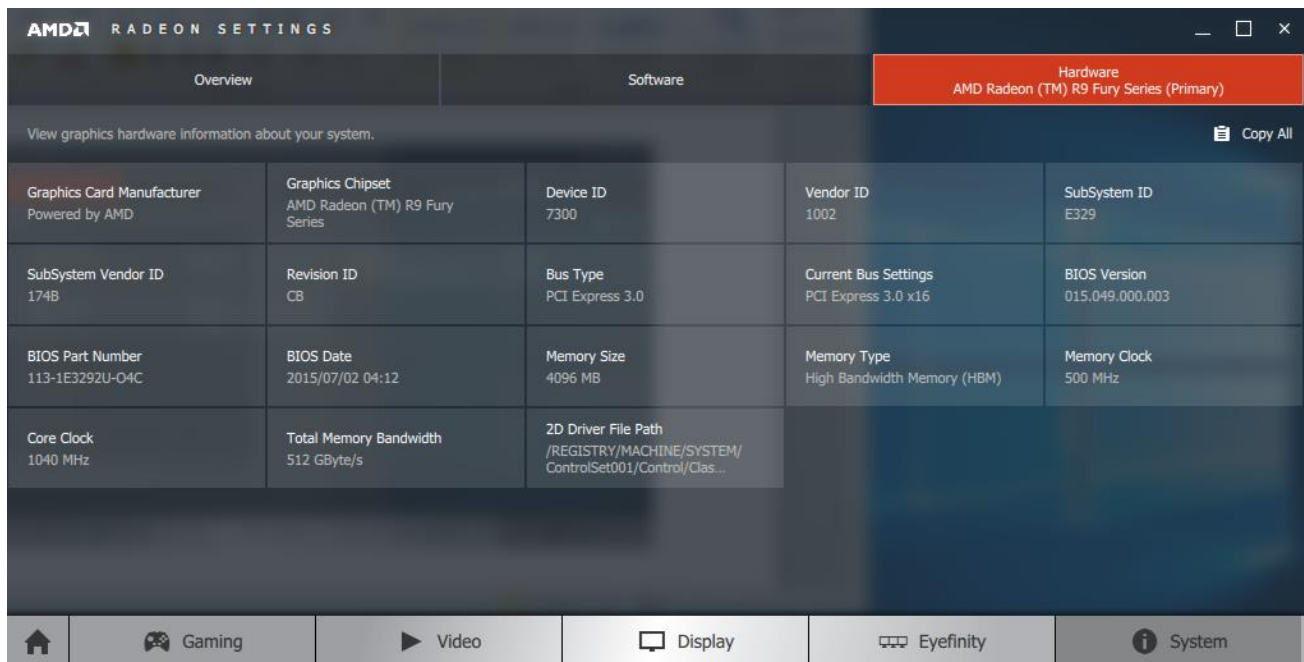
- In the AMD Radeon Settings click **System** located on the top right corner.



- Click the **Hardware** tab located on the top right corner



- The **Graphics Chipset** information should indicate the model of the graphics card.



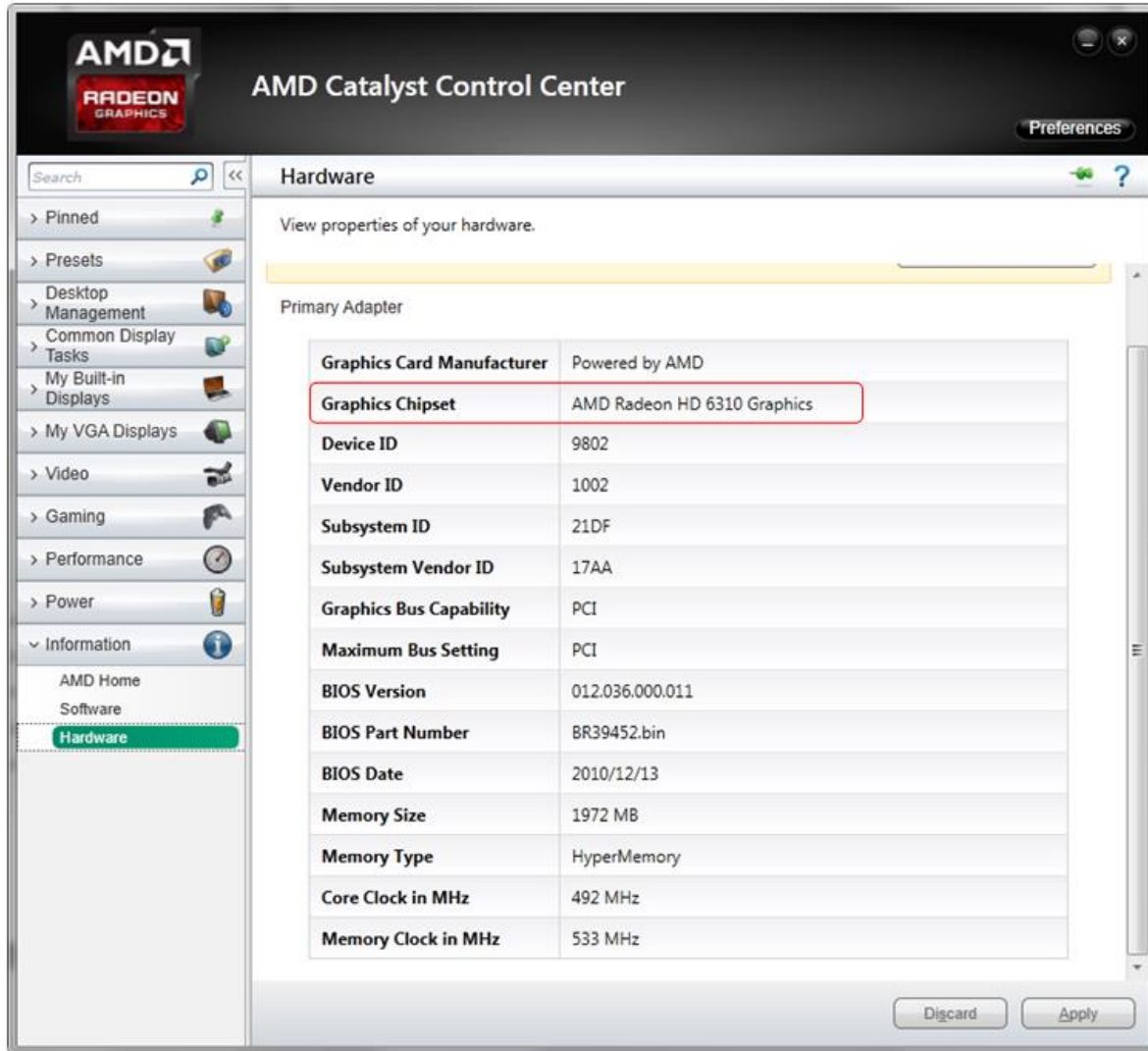
Using the AMD Catalyst™ Control Center:

Provided that the graphics drivers are correctly installed and functioning, the model of the graphics card may be found using the AMD Catalyst™ Control Center.

- Open the AMD Catalyst™ Control Center by opening the Start menu and select Search. In the Search box type "AMD Catalyst Control Center", then click on the AMD Catalyst Control Center icon.
- The AMD Catalyst Control Center can also be opened by right clicking any empty space on the desktop and from the menu select AMD Catalyst Control Center.
- If the AMD Catalyst Control Center is in Standard View mode, then scroll down to Information, select Product Summary, then select Hardware. The Graphics Chipset should indicate the model of the graphics card.



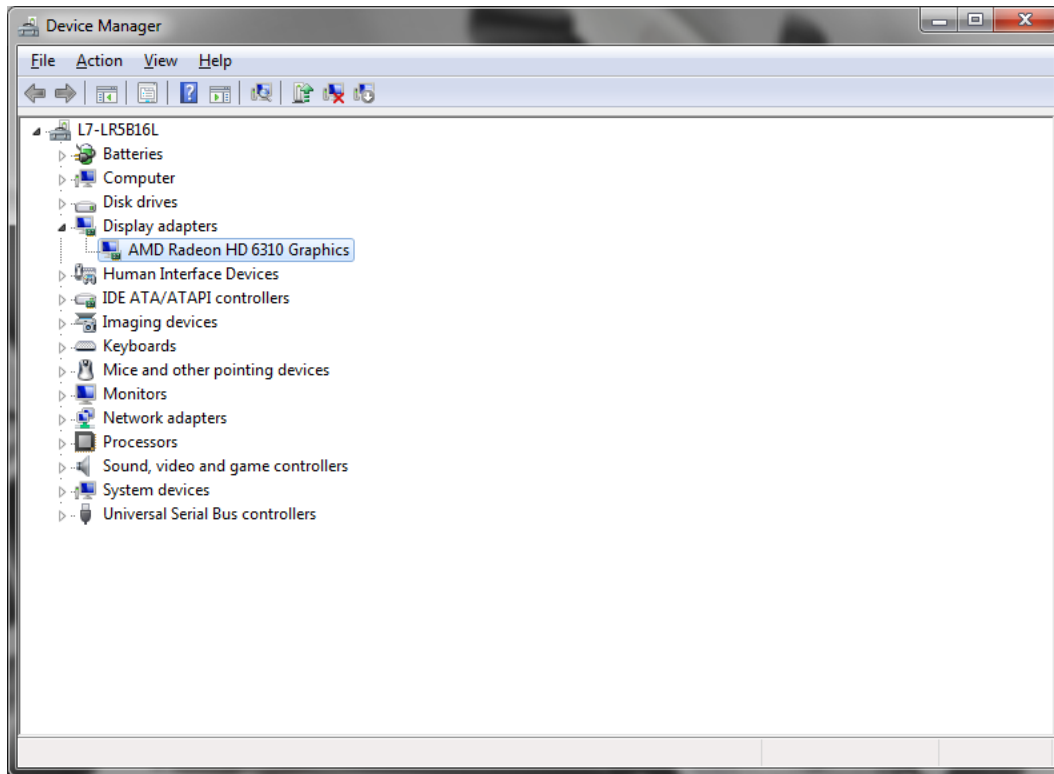
- If the AMD Catalyst Control Center is in Advance View mode, click on the Information tab located on the left side menu, then click Hardware. The Graphics Chipset should indicate the model of the graphics card.



Using the Device Manager:

Provided that the graphics drivers are correctly installed and functioning, the model of the graphics card may be found using the Device Manager.

- Click on the Start button
- Type in devmgmt.msc by using the Run command or Device Manager in the Search field
- Click OK or press Enter
- Click Display adapters to expand
- The graphics card model number should appear under Display adapters



By physical inspection:

The manufacturer or model of the graphics card should be located in one of two places.

- The manufacturer name and logo and the graphics card model should be printed somewhere on the retail packaging of the product.



- The model number should be printed on the barcode sticker located on the back of the graphics card.



Using the Subsystem Vendor ID and Device ID of the graphics card:

The manufacturer and model of the graphics card may be identified using its Subsystem Vendor ID and Device ID, respectively. This method can be used on a system that does not have the graphics driver installed.

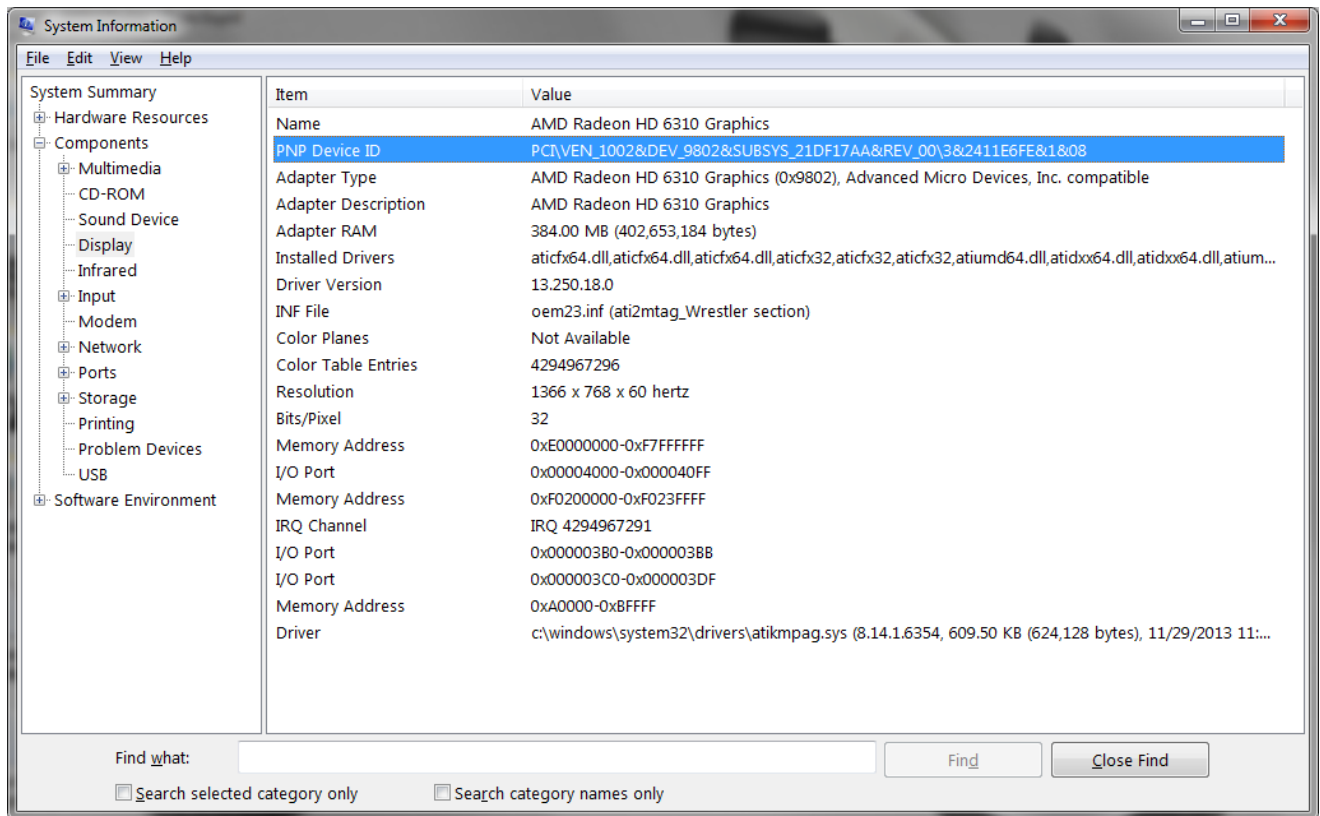
The graphics card Subsystem Vendor ID and Device ID may be located using the Windows® System Information tool.

To access the Windows® System Information tool:

- Click Start and type System Information in the Search field.
- Select System Information from the results
- Expand Components and select Display
- Note the PNP Device ID value on the right window pane

In the example shown below the PNP Device ID value is:

PCI\VEN_1002&DEV_9802&SUBSYS_21DF17AA&REV_00\...



NOTE: For the purpose of identifying the graphics card manufacturer and model, only the DEV and SUBSYS segment values will be used.

NOTE: Only the last four alphanumeric characters in the SUBSYS string segment are used to determine the Subsystem Vendor ID.

The highlighted segment in the value string indicates that the graphics card Device ID is **9802**, and the Subsystem Vendor ID is **17AA**.

PCI\VEN_1002&DEV_9802&SUBSYS_21DF17AA&REV_00\...

Once the graphics card Subsystem Vendor ID has been found, match it to the list below of manufacturers to identify the manufacturer or origin of the graphics card.

Subsystem Vendor ID	Manufacturer
1043	ASUSTeK
196D	Club 3D
1092	Diamond Multimedia
18BC	GeCube

1458	Gigabyte
17AF	HIS
16F3	Jetway
1462	MSI
174B	Sapphire
148C	PowerColor
1545	VisionTek
1682	XFx
1025	Acer
106B	Apple
1028	Dell
107B	Gateway
103C	HP
17AA	Lenovo
104D	Sony
1179	Toshiba

To identify the model of the graphics card using its Device ID, refer to a 3rd party resource: [PCIDatabase](#).

On the PCIDatabase website, enter the graphics card Device ID with the "0x" prefix in the Device Search field and click Search (as shown below).

Device Search:

The results should provide the model of the graphics card. For example: Using the Device ID 9802, the model of the graphics card is identified as AMD Radeon™ HD 6310.

Device Search Results

Returning 1 match for: "0x9802"
Sorted by: Device ID

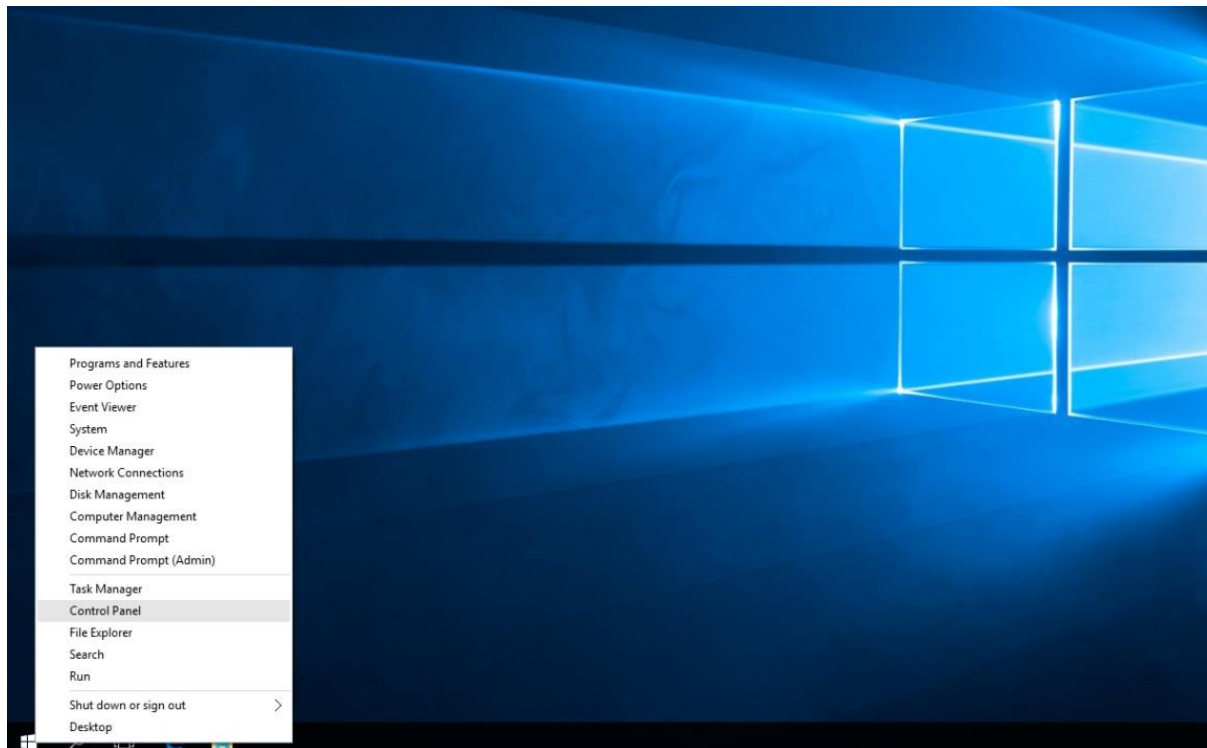
Device Id	Chip Description	Vendor Id	Vendor Name
0x9802	AMD Radeon™ HD 6310 Graphics	0x1002	Advanced Micro Devices, Inc.

How-To Uninstall AMD Radeon™ Software from a Windows® Based System

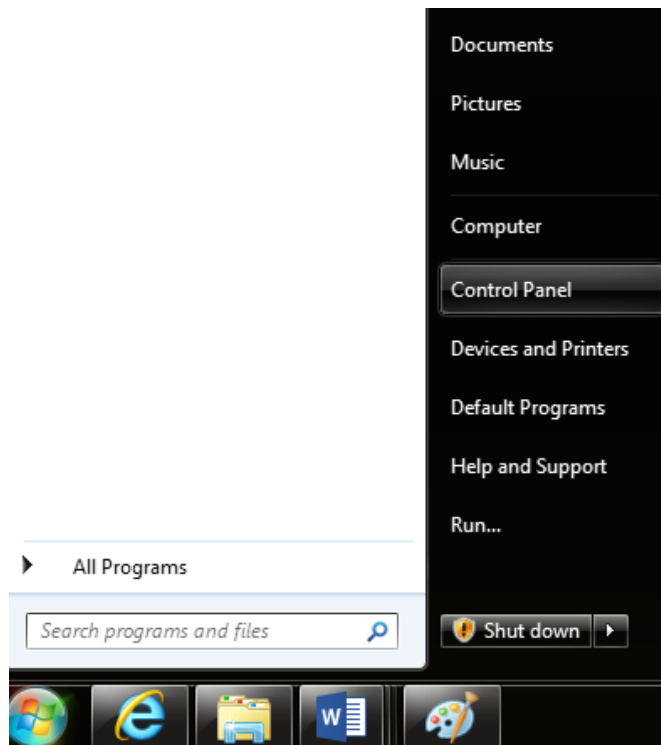
Article Number: GPU-629

This article provides step by step instructions on how to uninstall the AMD Radeon™ Software from a Windows® based system.

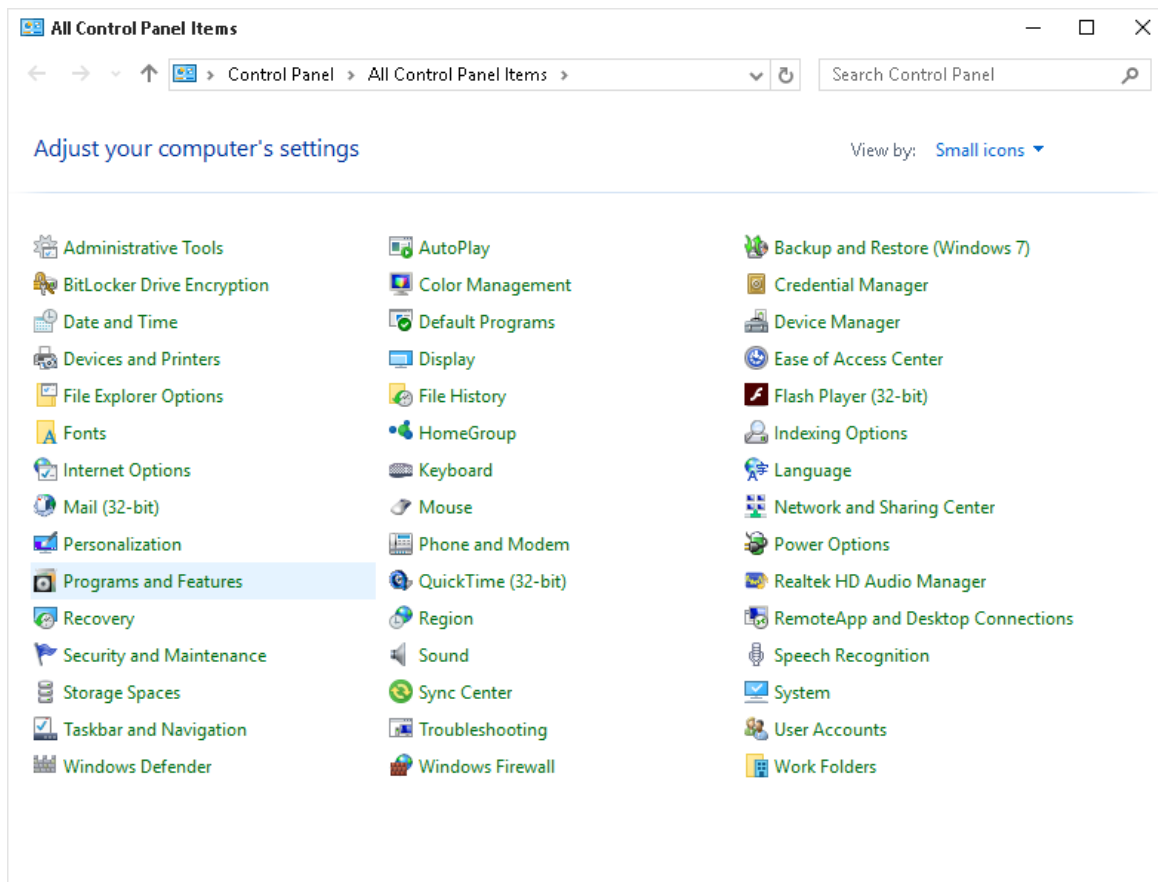
1. Start by opening the **Control Panel**
 - For Windows® 10/8.1, right-click on the Windows button and select **Control Panel** from the Context Menu



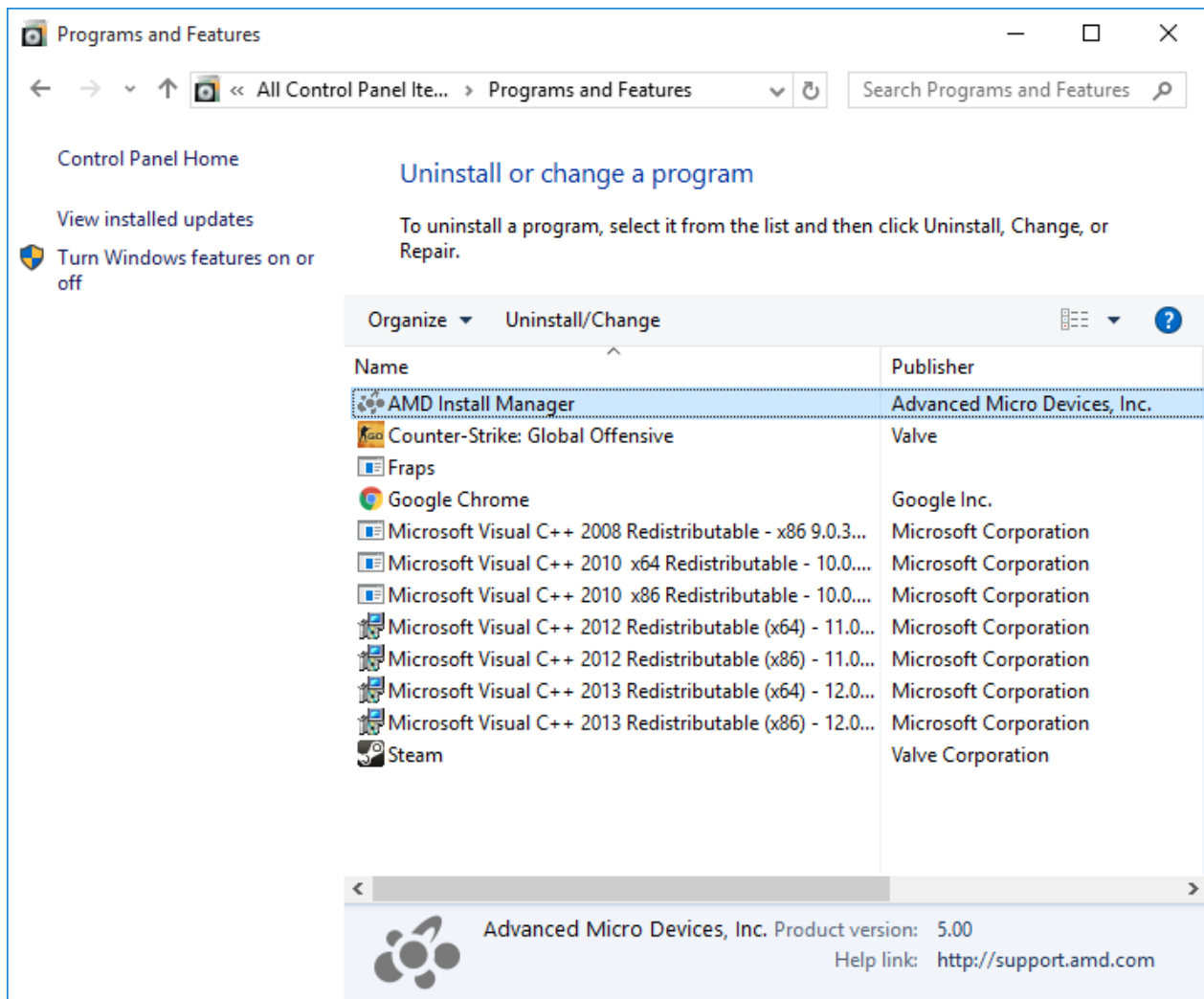
- For Windows® 7, click on the Windows button and select **Control Panel** from the Start Menu



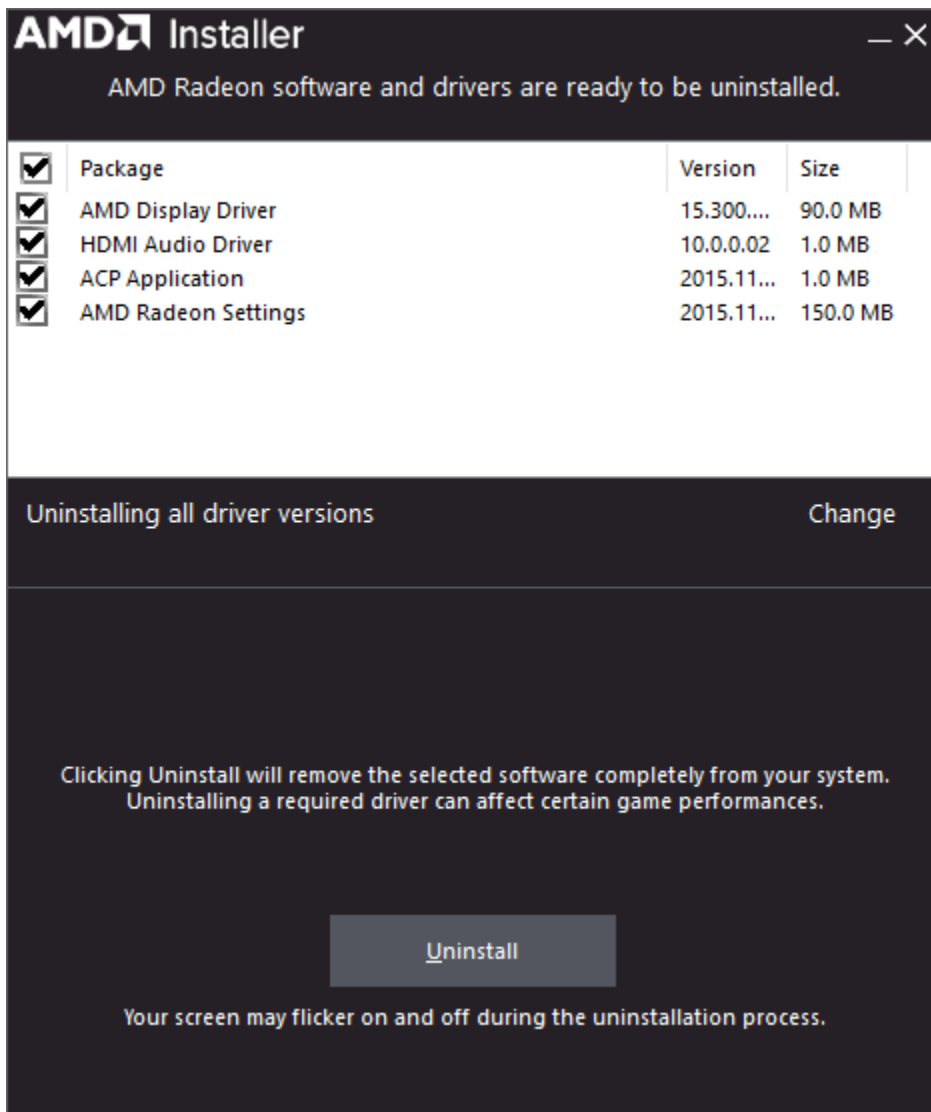
2. In the **Control Panel** select **Programs and Features**



3. Select **AMD Install Manager** and then click **Uninstall/Change**

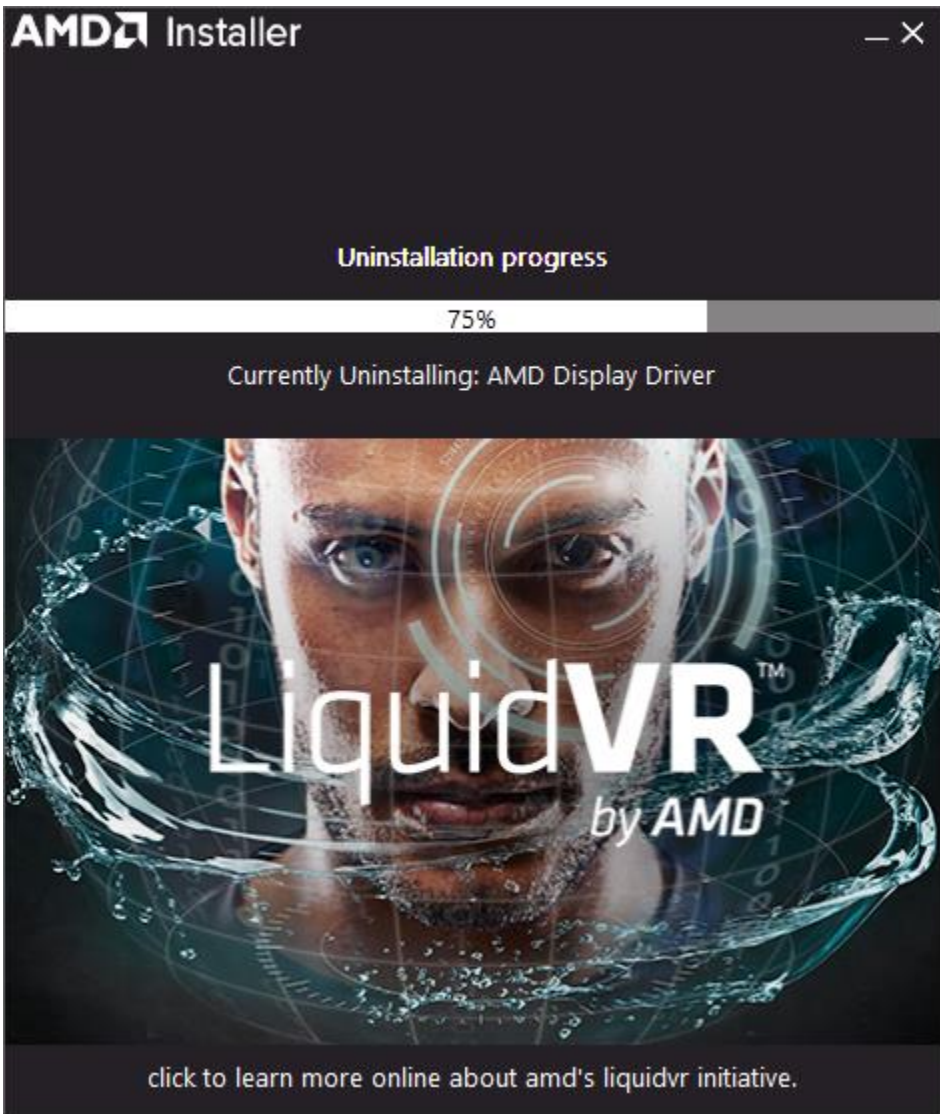


4. Check all items, and then click the **Uninstall** button.

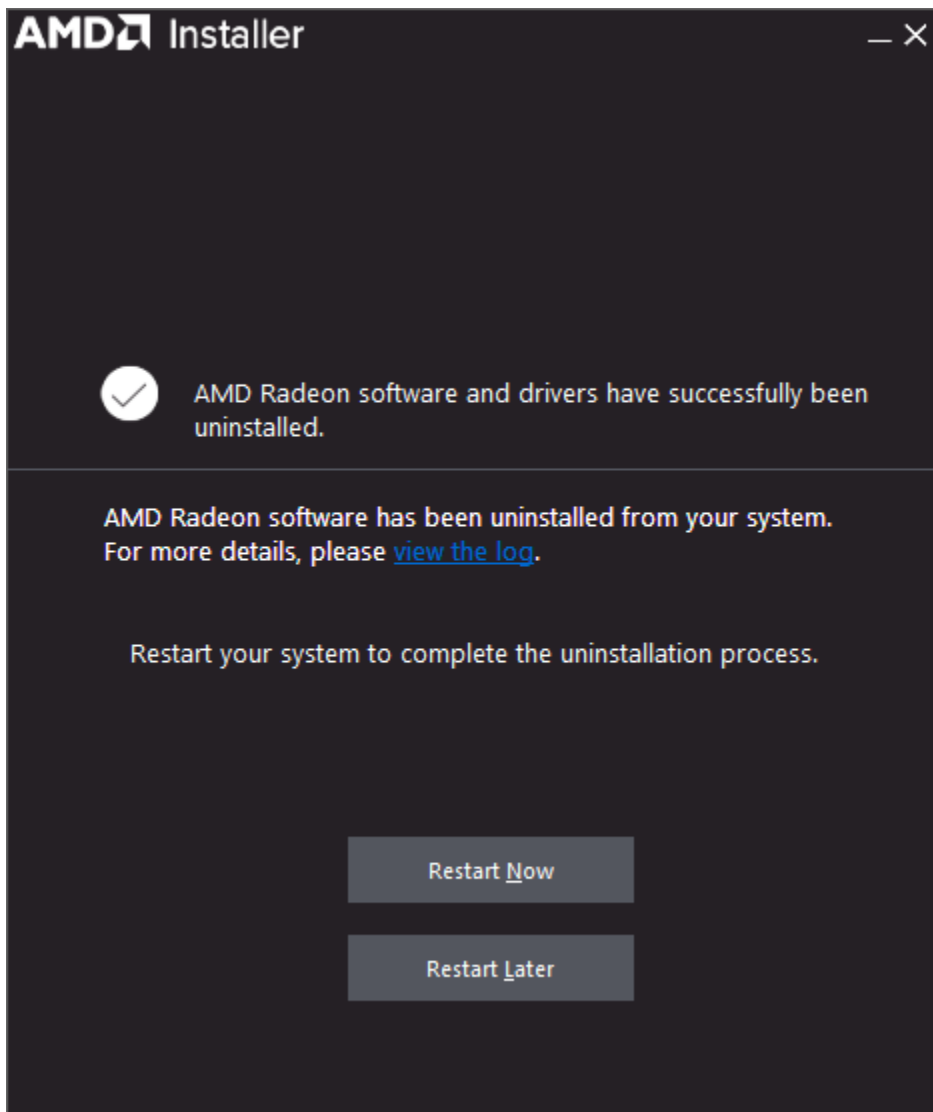


Note: If you had others versions of AMD drivers installed previously, you should get an additional prompt providing the options to remove All Versions or Current Version.

- Select **All Versions** to remove all AMD drivers and application components (recommended).
 - Select **Current Version** will uninstall only the latest version of the drivers and its related components.
5. The uninstall process will begin removing drivers and software components.



6. Select **Restart Now** to complete the uninstallation process.



7. To verify that the AMD Radeon Software has been removed from the system, return to the **Program and Features** list, and check that there are no AMD entries. If AMD specific entries are still listed, remove them using the above process.

AMD Clean Uninstall Utility

The AMD Clean Uninstall Utility will attempt to remove any previously installed AMD Catalyst™ display and audio drivers, and cleans up left-over files and registry entries from the system. This helps to prepare the system for a better driver installation experience.

NOTE: The AMD Clean Uninstall Utility should only be used if the normal uninstallation procedure using the Windows Control Panel's Programs and Features option is unsuccessful.

NOTE: All previous versions of AMD display and audio drivers as well as AMD software components will be removed by the AMD Clean Uninstall Utility. This utility removes the enumerations created under the display and audio registry keys resulting from multiple graphics cards.

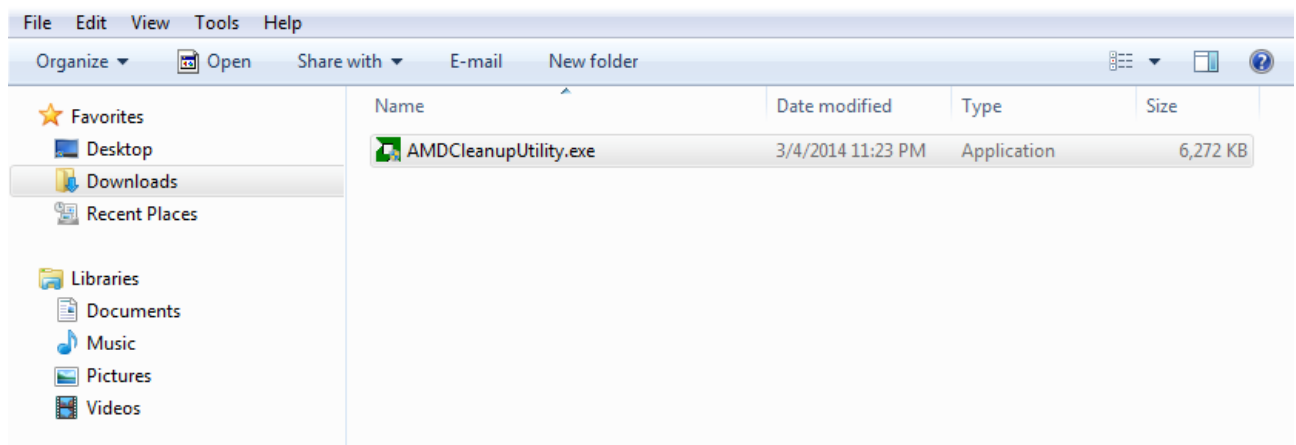
The AMD Clean Uninstall Utility can be downloaded from the following link:

- [AMD Clean Uninstall Utility](#)

NOTE: The AMD Clean Uninstall Utility is designed to be supported only on systems running Microsoft Windows® 7 and above.

How to use the AMD Clean Uninstall Utility:

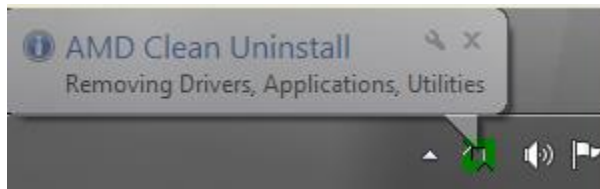
1. After downloading the AMD Clean Uninstall Utility, locate the file where it was saved and double click on the "AMDCleanupUtility.exe" icon.



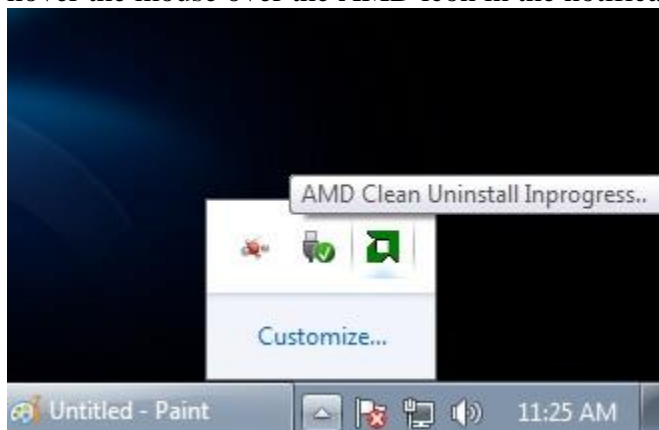
2. A warning message will appear stating that the AMD Clean Uninstall Utility will remove ALL AMD driver and application components.



- Click "**OK**" to continue
 - Click "**Cancel**" if you wish to exit the AMD Clean Uninstall Utility
3. After clicking "**OK**" the utility will be minimized to the notification area (system tray) and the progress will be displayed as a tooltip.

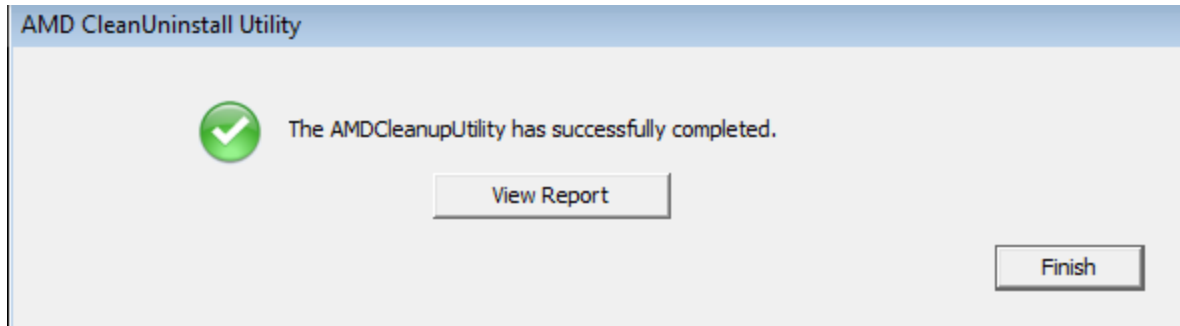


4. The uninstall process will continue to run in the background. To check the progress, hover the mouse over the AMD icon in the notification area.

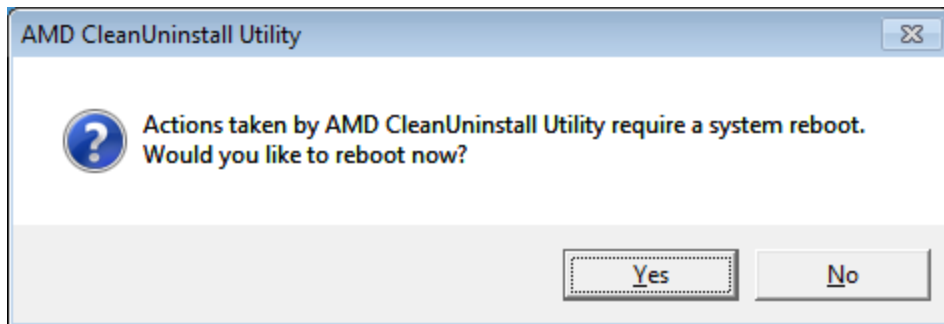


NOTE: While the uninstall process is running, the display may flicker or turn black for a few seconds. This is normal while the system is applying new settings.

5. Once the uninstallation process is finished, a message is displayed stating it has successfully completed. Click "**View Report**" to see the list of components that were uninstalled otherwise, click "**Finish**" to exit the utility.



- To finalize the uninstall process click "Yes" to reboot the computer.



NOTE: *The system must be rebooted after running this utility.*

Supported Operating Systems

- Windows 10 32-bit and 64-bit
- Windows 8.1 32-bit and 64-bit
- Windows 8 32-bit and 64-bit
- Windows 7 32-bit and 64-bit

Supported Hardware

- AMD Desktop Graphics
- AMD Professional Graphics
- AMD APU Graphics
- AMD Integrated Graphics

Troubleshooting:

If you run into any issues during the execution of the utility, you can recover the system to its prior state using the system restore point (AMD Cleanup Utility Restore Point) that is created by the utility before performing cleanup activity.

How-To Install AMD Radeon™ Software on a Windows® Based System

This article provides instructions on how to install AMD Radeon™ Software on a Windows® based system. The content of this article is organized into the following sections:

- Downloading the AMD Radeon™ Software
- System Requirements
- Installing the AMD Radeon™ Software

Downloading the AMD Radeon™ Software

There are two options to locate and download the latest version of the AMD Radeon™ Software:

1. Use the [AMD Driver AutoDetect Utility](#) to detect your AMD Radeon™ graphics card and Windows® operating system. If your graphics card and operating system is compatible with AMD Radeon™ Software, the utility will provide the option to download it.
2. Visit the [Drivers + Download Center page](#) and select the version of AMD Radeon™ Software for download. For instructions please refer to KB article: [How to find the latest drivers for an AMD graphics card](#).

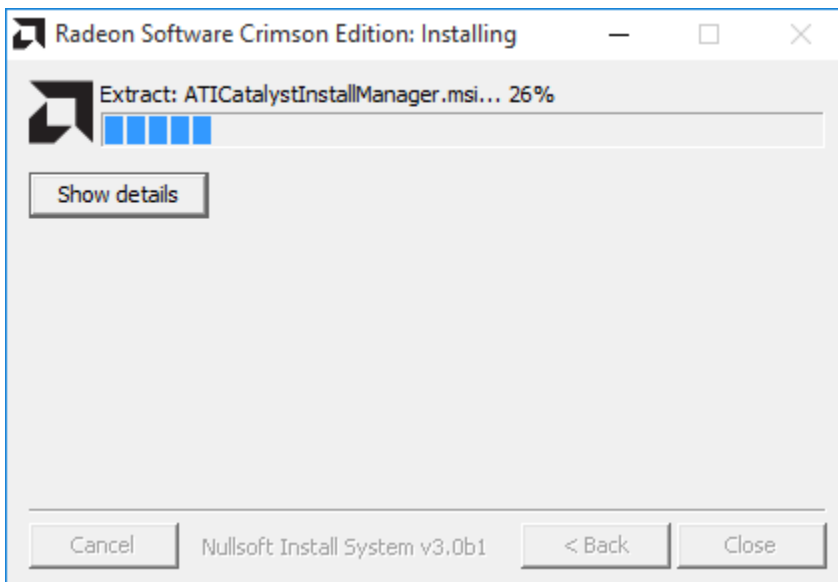
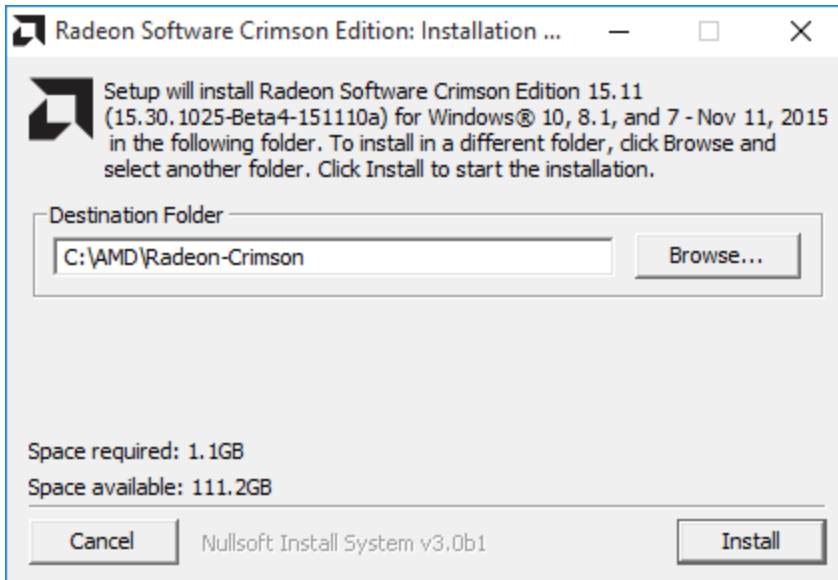
System Requirements

For information about the system requirements refer to the AMD Radeon™ Software release notes. Release notes are linked on the driver download page. System requirements may vary depending on the Windows® operating system installed.

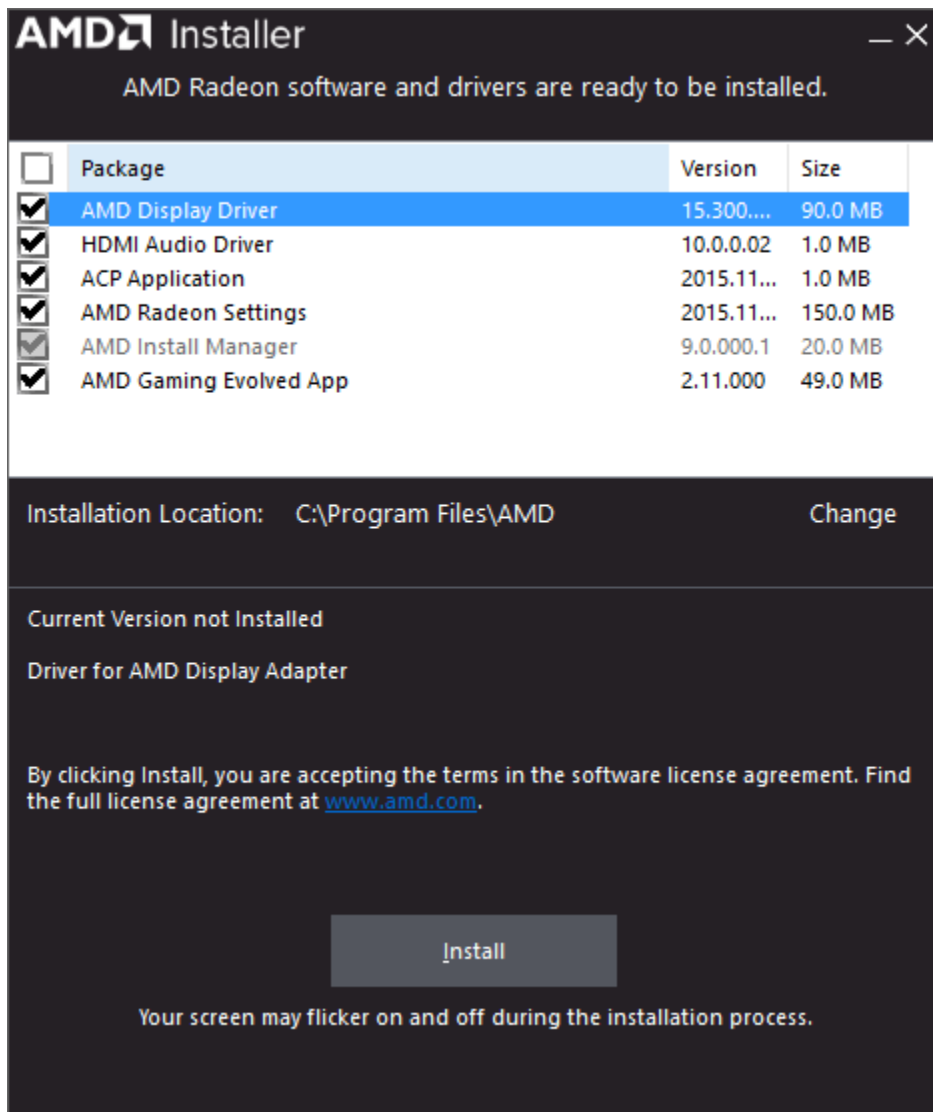
Note: AMD Radeon™ Software is only supported on Windows® 10, Windows 8.1, and Windows 7.

Installing the AMD Radeon™ Software

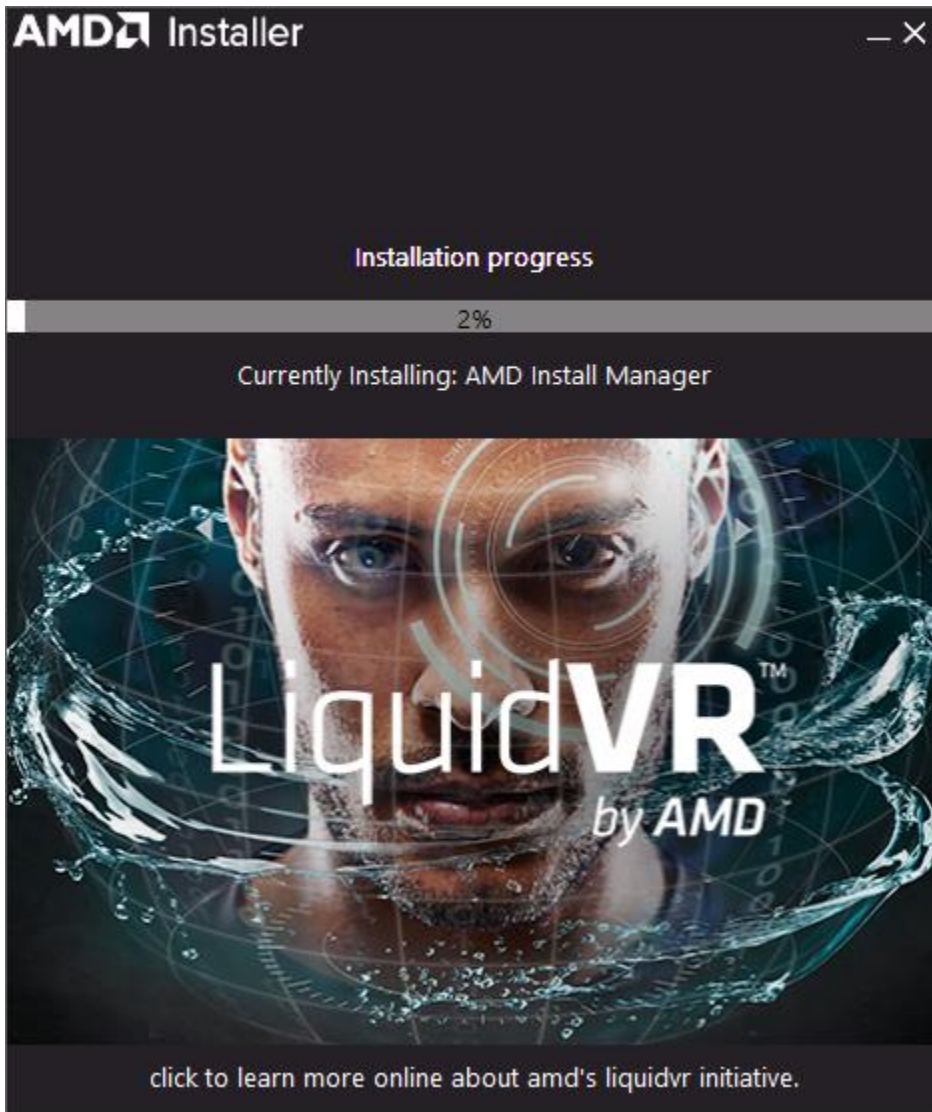
1. Ensure that any existing versions of AMD Radeon™ Software on the system have been uninstalled before proceeding with installing a new driver. For instructions on how to uninstall AMD Radeon Software please refer to KB article: [How-To Uninstall AMD Radeon™ Software from a Windows® Based System](#).
2. Close all opened applications including anti-virus, firewall, remote-access, or webcam software before attempting the install process.
3. Double-click the downloaded file and select **Install** to begin file extraction process.
Note: It is recommended to use the default destination folder for installation.



4. Select the desired components or keep default selection (recommended) and click **Install**.



5. The drivers and software components will begin installing.
Note: The screen will flicker whilst the AMD Radeon™ Software is being installed. If you have multiple displays, some of them may turn black for a few seconds.



6. Once the drivers and software have been successfully installed, choose **Restart Now**
Note: A system restart is required to complete the installation process.\

