



## **AMDVBFLASH User Guide**

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## Revision History

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## OVERVIEW

➤ AMDVBFlash is a console mode (GUI mode as well specific to Windows) utility for AMD GPU device in a diagnostics environment providing ability to flash the VBIOS.

- AMDVBFlash utility supports erasing and programming video VBIOS on multiple platforms, including
- Windows 32/64 bit
  - UEFI
  - Linux
  - DOS

## SET UP

### Tool Execution Step

#### ➤ **Windows (Windows 32/64 bit)**

- Install the amdvbflash installer package
  - This will internally install the required tools driver required to run the tool.
- From the windows command prompt, go to the installed folder.
  - Tool will be installed under  
“C:\Program Files\AMD\AMDVbFlash” or  
“C:\Program Files (x86)\AMD\AMDVbFlash” folder
- Run “amdvbflash.exe” with suitable command line arguments as required.
- Run “amdvbflashWin.exe” to launch GUI version of the tool.

#### ➤ **UEFI**

- Unzip the .zip file to any folder.
- Copy “amdvbflash.efi” to UEFI shell.
- Run “amdvbflash.efi” with suitable command line arguments as required.

#### ➤ **Linux**

- Unzip the tar.gz file to any folder.
- Run “./amdvbflash” with suitable command line arguments as required.

#### ➤ **DOS**

- Unzip the .zip file to any folder.
- Copy “amdvbflash.exe” to the DOS environment
- Run “amdvbflash.exe” with suitable command line arguments as required.

## COMMAND LINE OPTIONS

### Help Command

- Run `amdvbflash` (or `amdvbflash -h`, `amdvbflash -?`, `amdvbflash /h`, `amdvbflash /?`) command to display the help

```

root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69# ./amdvbflash -h
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

--- amdvbflash v4.69 ---
-h, -?, /h, /?      Help (this screen)

Format: amdvbflash [command] [parameter1] [parameter2] [parameter3] <option/s>
[command]:
-i [Num]             Display information of AMD adapters in the system.
                    Display information of adapter [Num] if specified.
-ai [Num]            Display advanced information of AMD adapters on system.
                    Display advanced information of adapter [Num]
                    if specified.
-biosfileinfo <File> Displays the Bios info in file <file>
-p <Num> <File>      Write BIOS image in file <File> to flash ROM in Adapter
                    <Num>.
-pa [-padevid=] <File> Write BIOS image <File> to all appropriate adapters.
                    Use with -padevid or -passid or -pasvid or -pavbpn or -fp.
                    Command example:
                    command = -pa -padevid=0xFFFF al23.bin
-s <Num> <File> [Size] Save BIOS image from adapter <Num> to file <File>.
                    First [Size] kbytes (except for Theater in bytes) of ROM
                    content is saved if [Size] is specified.
-cf <File> [Sum]      Calculate 16-bit checksum for file <File>.
                    Checksum for the file is compared to [Sum] which is
                    the expected checksum
-cb <Num> [Sum]        Calculate 16-bit BIOS image checksum for adapter <Num>.
                    Checksum for the BIOS image is compared to [Sum] which is
                    the expected checksum
-cr <Num> [Size] [Sum] Calculate 16-bit ROM checksum for adapter <Num> and
                    compare it to the [Sum] specified. This command is
                    the same as -cb if [Size] is specified.
-t <Num>              Test ROM access of adapter <Num>
-v <Num> <File>        Compare ROM content of adapter <Num> to <File>
-mi <Num> [ID]         Modify SSID & SVID in BIOS image of adapter <Num> to
                    <ID>. SSID & SVID in BIOS image of adapter <Num> is
                    displayed if [ID] is not specified.
-mb <Num> <File>        Modify SSID, SVID, BIOS Pin Number, & Boot Message in
                    BIOS image of adapter <Num> to values in <filename>.
                    Input file example:
                    ssid = 715B
                    svid = 1002
                    biospn = "l13-xxxxxx-xx"
                    bootmsg = "AMD graphic board"
-pak <File>           Package an executable for BIOS update according to
                    the commands in <File>.
                    Config file example:
                    outfile = update.exe
                    banner = "Update v1.0"
                    infile = al23.bin
                    command = -pa -padevid=715B infile

```

```

-isr <Num> <Build Number> <Board Number> Set ISR number based on the given
                                             build and board number
                                             if not specified, print out ISR Number
-prod <Num> <12 digit serial number> Set PROD number based
                                       on the given serial number
                                       if not specified, print out SN Number
-checkprodsn <Num> <12 Digit Serial Number> Comparing the Prod SN based on
                                             existing prod sn saved in ROM

press any key to continue

<option/s>:
-fa Force flashing bypassing already-programmed check.
-fp Force flashing bypassing BIOS P/N check.
-sst Use SST25VFxxx flashing algorithm regardless of ROMID straps.
-st  Use ST M25Pxx flashing algorithm regardless of ROMID straps.
-atmel Use AT25Fxxx flashing algorithm regardless of ROMID straps.
-keepisrsn keep the ISR Number on the adapter when flashing a new VBIOS
-keepprodsn keep the Prod SN on the adapter when flashing a new VBIOS

press any key to continue

-siireset Specifies the GPIO Pin to be used as the Reset when updating
           SiI1930 microcontroller firmware
           Input example:
           -siireset=7 <No Spaces>
-siiuprog Specifies the GPIO Pin to be used as the uprog when updating
           SiI1930 microcontroller firmware
           Input example:
           -siiuprog=14 <No Spaces>
-scansii Overrides normal adapter detection to enable detecting SSI
          roms with/without TPI firmware
-log Logs output to amdvbflash.log, overrides existing file
-logappend Logs and appends output to amdvbflash.log
-ddc Enable DDC support
-padevid=<ID> Use with -pa command to update adapters of specific device ID.
-passid=<ID> Use with -pa command to update adapters of specific SSID.
-pasvid=<ID> Use with -pa command to update adapters of specific SVID.
-pavbpn=<VBPN> Use with -pa command to update adapters of specific VBIOS PN.

press any key to continue

-excl_memtrain_dtable When flashing on new VBIOS, a pre-determined memory
                      training data table in the old VBIOS will not be
                      overwritten.
-isr <adapter num> [build num] [board num] If build number and board number
                                           are specified, sets the ISR Number
                                           value in specified adapter.
                                           If only adapter is specified, the current
                                           ISR Number is displayed
-checkpn <adapter num> <filename> Checks PN of the current product
                                   and compares it to external file
-rsa <filename> Verify VBIOS image file RSA signature
* <Num> = adapter number, <File> = filename
* [Size] = data block size in KBytes, except for Theater Pro in Bytes
* Use command -i to see the adapter numbers in the system.

```



## Display Information Command (-i)

- Display all AMD graphic cards information detected on the system
- General graphic cards information

COMMAND:

**amdvbflash -i <Num>**

Display information of all the AMD adapter on the system or for specific adapter <Num> if specified.

```
root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69# ./amdvbflash -i
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

adapter seg  bn dn dID      asic          flash          romsize test   bios p/n
=====  == == ==  =====  =====  =====  =====  =====
0         0000 03 00 73BF Navi21        GD25Q80C        100000 pass  113-D4120XTX-014
```

## Display Information Command (-ai)

- Advanced graphic cards information

### COMMAND:

#### **amdvbflash -ai <Num>**

Display advanced information of all the AMD adapter on the system or for specific adapter <Num> if specified.

```
root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69# ./amdvbflash -ai
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

Adapter 0    SEG=0000, BN=03, DN=00, PCIID=73BF1002, SSID=0B0C1002)
  Asic Family      : Navi21
  Flash Type       : GD25Q80C      (1024 KB)
  Product Name     : NAVI21 Gaming XTX D412
  Bios Config File  : D4120XTX.014
  Bios P/N         : 113-D4120XTX-014
  Bios Version     : 020.001.000.014.013782
  Bios Date        : 04/09/20 18:38
  ROM Image Type   : Hybrid Images
  ROM Image Details :
    Image[0]: Size(44032 Bytes), Type(Legacy Image)
    Image[1]: Size(31232 Bytes), Type(EFI Image)
```

## Save VBIOS Command

- Save the VBIOS image from the ROM to a specified file.

COMMAND:

**amdvbflash -s <Num> <File>**

Read the VBIOS image into file <File> to save the ROM contents in Adapter <Num>

```
root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69# ./amdvbflash -s 0 113-D4120XTX-014.rom
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

0x100000 bytes saved, checksum = 0x377D
```

## Program VBIOS Command

- Program VBIOS image into the ROM
- Flash VBIOS at specific graphic card

COMMAND:

**amdvbflash -p <Num> <File>**

Write VBIOS image in file <File> to flash ROM in Adapter <Num>

```
root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69# ./amdvbflash -p 0 113-D4120XTX-014.rom
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

Old SSID: 0B0C
New SSID: 0B0C
Old P/N: 113-D4120XTX-014
New P/N: 113-D4120XTX-014
The result of RSA signature verify is PASS.
Old DeviceID: 73BF
New DeviceID: 73BF
Old Product Name: NAVI21 Gaming XTX D412
New Product Name: NAVI21 Gaming XTX D412
Old BIOS Version: 020.001.000.014.013782
New BIOS Version: 020.001.000.014.013782
Flash type: GD25Q80C
Burst size is 256
100000/100000h bytes programmed
100000/100000h bytes verified

Restart System To Complete VBIOS Update.
```

## Program VBIOS Command (multiple cards)

- Flash VBIOS with graphic card information (multiple card sequentially flashed)
- Auto-match mechanism to select the graphic card to program based on the input criteria
- Input criteria are:
  - sub-system ID
  - sub-vendor ID
  - VBIOS part number

### COMMAND:

**amdvbflash -pa [-padevid=] [-passid=] [-pasvid=] [-pavbpn=] <File>**

Write VBIOS image in file <File> to flash ROM with all the graphic cards that matches the input criteria.

```
root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69# ./amdvbflash -pa -padevid=0x73BF 113-D4120XTX-014.rom
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

BIOS file: 113-D4120XTX-014.rom
update adapters with BIOS P/N 113-D4120XTX-014
update adapters with PCI device ID 73BF
Programming adapter number: 0

Flashing adapter at BN=03 DN=00 ID=73BF (Dev ID matched)...
Old SSID: 0B0C
New SSID: 0B0C
Old P/N: 113-D4120XTX-014
New P/N: 113-D4120XTX-014
The result of RSA signature verify is PASS.
Old DeviceID: 73BF
New DeviceID: 73BF
Old Product Name: NAVI21 Gaming XTX D412
New Product Name: NAVI21 Gaming XTX D412
Old BIOS Version: 020.001.000.014.013782
New BIOS Version: 020.001.000.014.013782
Flash type: GD25Q80C
Burst size is 256
100000/100000h bytes programmed
100000/100000h bytes verified

Restart System To Complete VBIOS Update.

1 adapters updated
```

## Create Package Command

- Package the flash information into one standalone flash executable including VBIOS and flash utility
- User can program the VBIOS on the card by running this executable
- Input Can be customized with the following:
  - output flash executable name
  - brief description to be displayed during execution
  - VBIOS filename
  - Flash command

COMMAND:

**amdvbflash -pak <File>**

Package an executable for BIOS update according to the commands in <File>

```
root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69.1# ./amdvbflash -pak updateVbiosPackage.txt
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

command -pa -padevid 0x73BF -fa infile1 commands processed.
Package FlashVBIOSUtility.exe generated.
```

Config <File> example:

```
outfile = FlashVBIOSUtility.exe
banner = "Update v1.0"
infile = vbiosImg.rom
command = -pa -padevid=7340 infile
```

This will create a package “FlashVBIOSUtility.exe” which can flash all the connected gpu devices with device id “0x7340” using “vbiosImg.rom” VBIOS image file

## Compare ROM content command

- Compare the ROM content with an input VBIOS image

COMMAND:

**amdvbflash -v <Num> <File>**

Compare ROM content of adapter <Num> to <File>

```
root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69# ./amdvbflash -v 0 113-D4120TX-014
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

0x100000/0x100000 bytes verified
root@ub180404dk64:~/Desktop/NAVI21/amdvbflash/amdvbflash-4.69# ./amdvbflash -v 0 D4120TX.019
AMDVBFLASH version 4.69, Copyright (c) 2020 Advanced Micro Devices, Inc.

0x2/0xD0000 bytes verified

ERROR: 0FL04
```

## Compare Checksum Command

- Compare the VBIOS image and ROM content checksum

COMMAND:

**amdvbflash -cf <File> [Sum]**

Calculate 16-bit checksum for <File>. Checksum for the file is compared to [Sum] which is the expected checksum.

**amdvbflash -cb <Num> [Sum]**

Calculate 16-bit BIOS image checksum for adapter <Num>. Checksum for the BIOS image is compared to [Sum] which is the expected checksum.

**amdvbflash -cr <Num> [Size] [Sum]**

Calculate 16-bit ROM checksum for adapter <Num> and compare it to the [Sum] specified. This command is the same as -cb if [Size] is specified.