



AMD Windows Catalyst Driver
Release Notes

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1. Overview

Windows Embedded Catalyst Drivers include a set of drivers to enable Graphics and peripheral devices on selected development platforms.

2. New in this Release

- Catalyst & Chipset drivers refresh for Embedded R2000, V2000, R1000/LP and V1000 Series.

3. Windows Driver Support

Catalyst/Graphics Driver Support. Win 10 & Win11, x64 bit	Radeon Software Version	23.19.16
	AMDVER	31.0.21916.2
	Driver Packaging Version	240618a-404771C
Chipset Driver	AMD_Software_6.06.17.121	

4. OS & Processor Family support

Processor family	AMD Program	Win11 22H2 x64 bit	Win10 22H2 x64 bit	Win10 21H2 LTSC x64 bit
R2000 Series	Picasso FP5	X	X	X
V2000 Series	Renoir FP6	X	X	X
R1000 Series	Raven2 FP5		X	X
V1000 Series	Raven1 FP5		X	

Legend:

- X- supported.
- Blank- Not supported.

5. Supported feature list.

Features Group	Features category	V2000 Series	R2000 Series	R1000 Series	V1000 Series
3D	OGL 4.6	Yes	Yes	Yes	Yes
3D	Vulkan	Yes	Yes	Yes	Yes
Display	4K Cinema	Yes	Yes	Yes	Yes
Display	Number of displays	Refer display support table below			
Display	DP MST	Yes	Yes	Yes	Yes
Multimedia	H.264 decode	Yes	Yes	Yes	Yes
Multimedia	H.265 decode	Yes	Yes	Yes	Yes
Multimedia	VP9 decode	Yes	Yes	Yes	Yes
Multimedia	10-bit decode	Yes	Yes	Yes	Yes
Audio	DP Audio	Yes	Yes	Yes	Yes
External discrete graphics card (dGPU) validation	Refer table for dGPU pairing	No	No	R1305G & R1102G: No, R1505G & R1606G: Yes	Yes
Eyefinity	Auto Eyefinity (MST)	Yes	Yes	Yes	Yes
Eyefinity	Mixed rotation	No	Yes	n/a	n/a
Eyefinity	Mixed Alignment	Yes	Yes	Yes	Yes
Eyefinity	Tiled display SLS(4x1,3x1,2x1etc. .)	Yes	Yes	Yes	Yes
Eyefinity	Mixed Tiled display (2x2 ,1x3 etc...)	Yes	Yes	Yes	Yes
Eyefinity	Tiled Groups (1x2+1 ,1x2 + 1x2 etc...)	Yes	Yes	Yes	Yes
Eyefinity	Multi GPU (Eyefinity on single GPU)	No	No	R1305G & R1102G: No, R1505G & R1606G: Yes	Yes
Eyefinity	Bezel Compensation	Yes	Yes	Yes	Yes
EDID management	Advance Feature	Yes	Yes	Yes	Yes
Custom timing	Advance Feature	No	No	Yes	Yes
10-bit color	Advance Feature	Yes	No	Yes	Yes
dGMA	OpenGL	No	No	R1305G & R1102G: No,	Yes

				R1505G & R1606G: Yes	
dGMA	OpenCL	No	No	R1305G & R1102G: No, R1505G & R1606G: Yes	Yes
OpenGL	OpenGL	Yes	Yes	Yes	Yes
OpenCL	OpenCL	Yes	Yes	Yes	Yes
Peripherals	AHCI Drivers	Yes	Yes	Yes	Yes
Peripherals	AMD PSP Drivers	Yes	Yes	Yes	Yes
Peripherals	USB 3.0 Driver (ITB)	Yes	Yes	Yes	Yes
Peripherals	eMMC driver (ITB) (HS400 mode only)	No	Yes	Yes	Yes
Peripherals	Ethernet driver	No	No	Yes	Yes
Peripherals	Audio driver	Yes	Yes	Yes	Yes
Peripherals	GPIO2	Yes	Yes	Yes	Yes
Peripherals	I2C	Yes	Yes	Yes	Yes
Peripherals	UART	Yes	Yes	Yes	Yes
Peripherals	SMBUS	Yes	Yes	Yes	Yes
Peripherals	Watchdog	Yes	Yes	Yes	Yes
Peripherals	SPI	Yes	Yes	Yes	Yes
Peripherals	Serial (UART w/ COM interface)	Yes	Yes	Yes	Yes

6. Processor Display support

APUs	Max No of display
R2000 Series <ul style="list-style-type: none"> R2544 R2514 & R2314 R2312 	<ul style="list-style-type: none"> 4x 4K60 4x 1080p60 / 3x 4K60 3x 4K60
V2000 Series <ul style="list-style-type: none"> V2516 & V2546 V2718 & V2748 	<ul style="list-style-type: none"> 4x 4K60 / 4x 4K30
R1000 Series <ul style="list-style-type: none"> R1305G R1102G R1505G & R1606G 	<ul style="list-style-type: none"> 3x 1080p 2x 1080p 3x 4K60
V1000 Series <ul style="list-style-type: none"> V1202B, V1404I & V1605B V1756B & V1807B 	<ul style="list-style-type: none"> 3x 4K60 / 4x 1080p60 4x 4K60

7. Platform configurations

a) R2000 Platform (Bilby)

R2000 Platform (Bilby)	
Processor family	R2000 Series
Model (CPU config, CPU Base Frequency, GPU config, nominal TDP)	R2312 (2C/4T, 2.7 GHz CPU, 3 Vega CUs, 15W) R2314 (4C/4T, 2.1 GHz CPU, 6 Vega CUs, 15W) R2514 (4C/8T, 2.1 GHz CPU, 8 Vega CUs, 15W) R2544 (4C/8T, 3.35 GHz CPU, 8 Vega CUs, 45W)
BIOS version	RBP1002A
VRAM setting	R2312 & R2314 : 4GB R2514 & R2544 : 8GB
RAM (DDR4)	R2312 : 2x8GB 2400 MT/s Non-ECC R2314 : 2x8GB 2667 MT/s Non-ECC R2514 : 2x16GB 2667 MT/s ECC R2544 : 2x16GB 3200 MT/s ECC
Display Convertors / Dongles Used	DP Direct Cable, HDMI Direct Cable, DP-HDMI converter
Storage disk	M.2 SATA SSD, eMMC

b) V2000 Platform (Celadon)

V2000 Platform (Celadon)	
Processor family	V2000 Series
Model (CPU config, CPU Base Frequency, GPU config, nominal TDP)	V2516 (6C/12T 2.1GHz CPU, 6CUs GPU, 15W) V2546 (6C/12T 3.0GHz CPU, 6CUs GPU, 45W) V2718 (8C/16T 1.7GHz CPU, 7CUs GPU, 15W) V2748 (8C/16T 2.9GHz CPU, 7CUs GPU, 45W)
BIOS version	RCO1008A
VRAM setting	8GB
RAM (DDR4)	2x8GB SODIMM 2667 MT/s (Celadon socketed) 2x16GB SODIMM 3200 MT/s (Celadon DM Non-Nova)
Display Convertors / Dongles Used	DP Direct Cable, HDMI Direct Cable, DP-HDMI converter, Type C- DP, Type C -HDMI, Type C Direct Cable
Storage disk	M.2 NVME

c) R1000 Platform (Bilby)

R1000 Platform (Bilby)	
Processor family	R1000 Series
Model (nominal TDP), CPU Base Frequency	R1505G (B2 15W), 2.4 GHz R1606G (B4 15W), 2.6 GHz

	R1305G (LP B4 8W) 1.5 GHz R1102G (LP B2 6W) 1.2 GHz
BIOS version	RBB120AA
VRAM setting	4 GB
RAM (DDR4)	2x 8GB (LP B2 6W supports single 8GB DIMM)
Display Convertors / Dongles Used	DP to HDMI, DP to VGA, DP to DVI, mDP
Storage disk	M.2 SATA SSD

d) V1000 Platform (Bilby)

V1000 Platform (Bilby)	
Processor family	V1000 Series
Model (CPU config, nominal TDP, CPU Base Frequency, GPU config)	V1807B (4C 45W 3.35GHz CPU, 11 GPU CUs) V1756B (4C 45W 3.25GHz CPU, 8 GPU CUs) V1605B (4C 15W 2GHz, 8 GPU CUs) V1202B (2C 15W 2.3GHz, 3 GPU CUs) V1500B (16W NPU), 2.2 GHz V1780B (45W NPU), 3.35 GHz
BIOS version	RBB120AA
VRAM setting	4 GB
RAM (DDR4)	2x 8 GB
Display Convertors / Dongles Used	DP to HDMI, DP to VGA, DP to DVI, mDP
Storage disk	M.2 SATA SSD

8. SW Package

SW Component	WHQL certified drivers	Catalyst Installer Package	Chipset Installer Package	Comments
Display	Yes	Yes	No	Includes Graphics Drivers
PSP	Yes	No	Yes	
SBDrv:acpi	Yes	No	Yes	
SBDrv:SFH	Yes	No	Yes	Not supported on V1000, R1000, V2000, R2000
SBDrv:SFHI2C	Yes	No	Yes	
SBDrv:I2C	Yes	No	Yes	
SBDrv:SMBus	Yes	No	Yes	Null driver (AMD SMBUS Driver)
SBDrv:UART	Yes	No	Yes	Max 4M baud-rates
Audio:ACPBUS	Yes	Yes	No	
Audio:HDMI	Yes	Yes	No	
Audio:HDABUS	Yes	No	No	I2S & I2STDM not applicable on V2000. I2STDM not applicable to R2000.
Audio:I2S	Yes	Yes	No	
Audio:I2STDM	Yes	Yes	No	
XGBE	Yes	No	Yes	Not applicable for V2000 and R2000.
Ryzen Power Plan	Yes	No	Yes	For V2000, “ AMD Processor Power Management Support ” gets installed as provisional package.
IOV	Yes	No	Yes	Null driver
SMBUS	Yes	No	Yes	Functional driver (AMD Emb SMBUS Driver) Block R/W Ops has data mismatch error on first byte.
CIR	Yes	No	Yes	Null driver (Feature not supported on V1000, R1000, R2000, V2000)
USB 3.1	Yes	No	Yes	
GPIO2	Yes	No	Yes	
Serial	Yes	No	Yes	Drivers: UART with COM interface. Max Baud rate: 115200, 3M, 4M bauds
Watchdog	Yes	No	Yes	

9. SW Package - Graphics Driver Version

The graphics driver package is also termed as 'ESE Q4 Driver' or 'Radeon Software'.

This package contains various independent drivers. Below are the version numbers of Radeon software and other drivers included. The same should also be visible with Radeon Software->System->Software & Driver Details.

S. No	SW Driver Description	Version
1	Radeon Software Version	23.19.16
2	Radeon Software Edition	Adrenalin
3	AMDVER	31.0.21916.2
4	Driver Packaging Version	23.19.16-240618a-404771C
5	2D Driver Version	8.1.1.1634
6	Direct3D®	12.1
7	OpenGL®	4.6
8	AMD Audio Driver	10.0.1.30
9	Vulkan™ Driver	2.0.279
10	Vulkan™ API	1.3.260

10. Known Issues/Limitations

a. R2000 Platform (Bilby)

1. AMD Audio Driver Version not available in AMD Radeon settings page.
2. Few testcases failed (45/79) with OCL Conformance test suite.
3. On R2544 OPN, display corruption and system hang observed during video playback with M& Tv application.
4. On Win11, Core-Isolation/Memory-Integrity feature/HVCI is not enabled by default.

Workaround:

- i. In BIOS, Enable IOMMU & SVM
 1. AMD PBS ->NB Configuration->IOMMU->Enable.
 2. Advanced->SVM support->Enabled.

- ii. In OS, Enable Memory-Integrity in Windows-security or with regkey.
 - 1. Core Isolation->Memory Integrity->On
 - 2. With reg key:
HKLM\SYSTEM\CurrentControlSet\Control\DeviceGuard\Scenario
s\HypervisorEnforcedCodeIntegrity -> Enabled=1
- 5. Stutters observed during video playback with EDID emulated.
- 6. UMA Buffer size (VRAM) is not reflecting correctly at the OS level after we tried to modify TDPs in the BIOS.
- 7. TDR Observed during Unigine Heaven OGL overnight stress
- 8. Stutters observed while playing 4K to 1080p transcoded video samples.
- 9. Sporadically MPEG, H.264 playback stutter observed after switching from windowed mode to full screen and vice-versa.
- 10. Observed overlapping issue on maximizing Tiny renderers Vulkan samples. Issue not seen with DirectX samples.
- 11. Stutter observed when video played with MSFT Edge Browser.
- 12. Audio & Video Lag observed in Teams/Zoom call with PPT slide show and Edge browser launched individually in 3x4K setup.
- 13. Stutter observed on Movies &TV full screen video playback while moving mouse pointer to bring up the seek bar.
- 14. EDID UI closes automatically while emulating from secondary display. Primary display can be used.
- 15. Orientation tab is grayed out in Display settings with Eyefinity enabled
- 16. Sporadically (4/10 times) Green color display observed while performing reboot function with HDMI display (Pixel Format: YCbCr 4:2:0), with LG27UK650 panel.
- 17. Sporadically (2/5 times) green display observed with 2x1/1X2 Eyefinity arrangement during restart cycles with HDMI.
- 18. Depth Bounds Test Dx11 application crashes while launching.
- 19. SD Card hot plug is not detected.
- 20. Secondary monitors light up even with MST option turned OFF in monitors (Daisy chain mode).
- 21. Stutters & Video Lags observed for all Media formats.
- 22. Stutters observed for playback through edge browser with multiple monitors connected.
- 23. Glitches observed in Audio on Zoom calls with multi-monitors connected.
- 24. Sporadically observing “can't play error 0x800706ba” on Movies and TV App with VP9 video after resuming from sleep.
- 25. Sporadically resolution mismatch observed after creating Eyefinity using “Quick Setup”.
- 26. Video hang and TDR observed when forward and rewind the H265 video.
- 27. Position Windows Taskbar functionality not working in Radeon Additional settings.

- 28. Display light up fails on 2nd and 3rd DP display with LG monitor after reboot.
- 29. 2x2 Eyefinity is not working with FIT and Expand layout.
- 30. USBC display light up issues observed on onboard USBC display port 0
- 31. Stutters observed during HEVC Video playback with USBC display connected to onboard USBC port.
- 32. Platform is getting powered "ON" using (USBC) Type-C to Type-C display without using a power adapter.
- 33. With USBC display connected to onboard USBC port, errors are observed in log files during long run S3 cycles like 'system rebooted unexpectedly, ACPI errors and device instance errors'.
- 34. CPU Utilization mismatch observed between AMD Radeon Performance UI and Task manager.
- 35. Sporadically TDR observed while resuming from S3 with EDID emulated displays
- 36. 3x1 Eyefinity creation fails after enabling and disabling 2X1 Eyefinity.
- 37. EDID UI display numbers are not matching with OS display settings page display numbers.
- 38. GFX option under Die 0 is missing from Thermal Checker in AMD AVT
- 39. Observed AMDRadeonSettings Installation UI Crash during driver only Installation.
- 40. I2STDM driver supports both I2S & I2STDM functionality.
For I2S functionality, use below workaround.
Workaround: Uninstall ACPBus & I2STDM drivers obtained by default from Catalyst driver. Install explicitly provided ACPBus and I2STDM drivers after reboot.

R2544/R2514 Only

- 41. System hang observed after resume from S3 on few systems 3 out of 5 times

b. V2000 Platform (Celadon)

- 42. SPI RDID Command result shows all 0s.
- 43. Failed Creating the Direct3D device error observed while launching Barycentrics11 and CrossfireAPI11.
- 44. Stutters observed while playing 30fps video playback.
- 45. Chipset Installation is showing successful but log file shows as " FAIL" for AMD Processor Power Management Support.
- 46. Sporadically (1/5) Multiple display blanks out observed post Eyefinity arrangement [Nx1 or 1XN]
- 47. Few testcases failed (45/79) with OCL Conformance test suite.
- 48. Performance drops in Passmark 10(2D Graphics Mark) and Passmark rating on Win11 OS compared to Win10. Disabling VBS & HVC improves performance.

- 49. Time Based Profiling and Power Profiling in AMDuProf tool is not supported in Win11 22H2 OS.
- 50. Modern Standby is not supported on RS5 with SATA SSD.
Workaround: Use NVMe M.2 disk
- 51. BIOS settings to enable S3 (default settings):
 - i. AMD PBS ->S3/Modern Standby S3 enable.
 - ii. Boot UEFI OS Fast Boot Option --> Disable.
- 52. BIOS settings required for Modern Standby:
 - i. AMD PBS -> S3/Modern Standby Support = <Modern Standby Enable>
 - ii. AMD PBS -> Modern Standby Type = <Modern Standby + S0i3>
 - iii. AMD PBS -> Reduced Hardware Support = <Enabled>
- 53. BIOS Settings to avoid yellow bang with I2C and UART enabled in BIOS:
 - i. Setup Utility->AMD PBS->NFC Support->Disabled
 - ii. Setup Utility->AMD PBS->ALS Support->Disabled
 - iii. Setup Utility->AMD PBS->Touch Panel Support->Disabled
 - iv. Setup Utility->AMD PBS->Touch Pad Support->Disabled
- 54. S3 is enabled by default in BIOS. If switched to MSB, re-install graphics and chipset drivers.
- 55. Display or media player blank out observed only once for few seconds, on playing video after shutdown & boot. If media player is not recovering, re-open the media player.
- 56. Setup failed Error during hot unplug after quick Eyefinity.
- 57. Tearing with Eyefinity: All displays will be tear free only if all displays are using the same timing and same connector type
- 58. Display blank out is observed for Eyefinity in portrait mode.
- 59. Sporadically Display blank out, system hang, BSOD is observed during video playback with Eyefinity arrangement.
- 60. Eyefinity is not functional with mix of DP and HDMI monitors.
- 61. Using Quick Setup Vertical position Eyefinity configuration fails for 1st time.
- 62. Sporadically observing system hung during reboot with 2x1 or 1x2 Eyefinity configuration.
- 63. BSOD observed while doing AMDDeSPI tool command execution.
- 64. EDID UI display numbers are not matching with OS display settings page display numbers.
- 65. Eyefinity creation failing after trying N-1X1 or 1XN-1 Eyefinity with N displays connected.
- 66. Vulkan GLTF samples are crashed followed by hang while doing resize to minimum.
- 67. Observed AMDRadeonSettings Installation UI Crash during driver only Installation.

- 68. Sporadically (1/5) system not entering MSB because of active High-definition audio controller.

c. R1000 & V1000 Platform (Bilby)

- 69. Few testcases failed (45/79) with OCL Conformance test suite.
- 70. SD Card as bootable device does not support High Speed (HS) and at UHS I – DDR50
- 71. MPEG/H.264 playback stutter observed after switching from windowed mode to full screen and vice versa.
- 72. ROM Armor is an unsupported feature for SPI ROM driver. No plan to enable ROM Armor in the future.
- 73. Radeon Pro Settings UI not opening after EDID emulation and Reboot.
Workaround: Close the Radeon Pro UI before reboot.
- 74. I2STDM driver supports both I2S & I2STDM functionality but are not validated.
- 75. For I2S & I2STDM functionality, use below workaround.
Workaround: Uninstall ACPBus & I2STDM driver obtained by default from Catalyst driver. Install ACPBus and I2STDM provided explicitly after reboot.
- 76. Frequently (7/10 times) video playback corruption observed while performing windowed to full screen mode with Eyefinity enabled."
- 77. Frame Rate displays as N/A in metrics under performance of AMD Radeon software.
- 78. VC1 Video getting Paused during Hot plug
- 79. Multiple tests failure observed while running OCL_Conformance 2.0.
- 80. Sporadically Uninstall fails after catalyst driver installed in Minimal method

R1000-LP R1305G / R1102G Only

- 81. On R1102, 4K display light up fails.
- 82. S3 resume fails after around 250 cycles.

d. Eyefinity (V1000, R1000, V2000, R2000)

- 83. Very Sporadically TDR observed during Eyefinity creation
- 84. TDR and system hang observed during S3 long run.
- 85. Setup failed Error during hot unplug after quick Eyefinity.
- 86. Tearing with Eyefinity: All displays will be tear free only if all displays are using the same timing and same connector type.
- 87. Display blank out is observed for Eyefinity in portrait mode.
- 88. Sporadically Display blank out, system hang, BSOD is observed during video playback with Eyefinity arrangement.
- 89. Eyefinity is not functional with mix of DP and HDMI monitors.
- 90. Using Quick Setup Vertical position Eyefinity configuration fails for 1st time.

91. Sporadically observing system hung during reboot with 2x1 or 1x2 Eyefinity configuration.

10. Notes on Validation

1. R2000, V2000, R1000/LP and V1000 are validated with these drivers.

11. Support

Please contact your Field Application Engineer for support on this release.

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