

OpenGL ES 3 hardware matrix

Extensions exposed by OpenGL ES implementations

August 2016, G-Truc Creation

Nomenclature:

Supported
Not supported
Support added from previous report

OpenGL ES vendor extensions	Adreno			Apple			Mali			Mesa	Tegra		PowerVR		Vivante		Intel	
Architecture	300	400	500	6	6XT	7	600	700	800	Mesa	K1	X1	6	6XT	7	7000XS	B.T.	C.T.
<u>APPLE clip distance</u>	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X	X	X	X
<u>APPLE color buffer packed float</u>	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X	X	X	X
<u>ARM shader framebuffer fetch</u>	X	X	X	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X
<u>ARM shader framebuffer fetch depth stencil</u>	X	X	V	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X
<u>ARM shader local storage</u>	X	X	X	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X
<u>ARM packed arithmetic</u>	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X	X	X	X
<u>NV bindless texture</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV conditional render</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV draw texture</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV conservative raster</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV fill rectangle</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV fragment coverage to color</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV fragment shader interlock</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV framebuffer mixed samples</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV geometry shader passthrough</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV image formats</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV internalformat sample query</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV path rendering</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV path rendering shared edge</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV pixel buffer object</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV polygon mode</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV sample locations</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV sample mask override coverage</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>NV shader noperspective interpolation</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV shadow samplers cube</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV shadow samplers array</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV texture border clamp</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV texture compression latc</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV texture compression s3tc</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV texture compression s3tc update</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV viewport array</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV viewport array2</u>	X	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X	X	X
<u>IMG multisampled render to texture</u>	X	X	X	V	V	V	X	X	X	X	X	X	V	V	V	X	X	X
<u>IMG texture compression pvrtc</u>	X	X	X	V	V	V	X	X	X	X	X	X	V	V	V	X	X	X
<u>IMG texture compression pvrtc2</u>	X	X	X	X	X	X	X	X	X	X	X	X	V	V	V	X	X	X
<u>IMG texture filter cubic</u>	X	X	X	X	X	X	X	X	X	X	X	X	V	V	V	X	X	X

INTEL fragment shader ordering	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	V	V
OVR multiview	X	V	V	X	X	X	X	V	V	X	X	X	X	X	X	X	X	X	X
OVR multiview2	X	V	V	X	X	X	X	V	V	X	X	X	X	X	X	X	X	X	X
OVR multiview multisampled render to texture	X	V	V	X	X	X	X	V	V	X	X	X	X	X	X	X	X	X	X
Support	29%	29%	29%	14%	14%	14%	29%	29%	29%	14%	71%	71%	29%	29%	29%		43%	29%	29%

OpenGL ES EXT extensions	Adreno			Apple			Mali			Mesa	Tegra		PowerVR		Vivante	Intel			
Architecture	300	400	500	6 6XT	7	600	700	800	Mesa	K1	X1	6 6XT	7 7000XS	B.T.	C.T.				
EXT base instance	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X		
EXT buffer storage	X	V	V	X	X	X	X	X	X	V	V	X	X	X	X	X	X		
EXT color buffer half float	V	V	V	V	V	V	X	V	V	X	V	V	X	X	X	X	V	V	
EXT copy texture	X	V	V	X	X	X	X	V	V	X	V	V	X	V	V	X	X	X	
EXT disjoint timer query	V	V	V	X	X	X	V	V	V	X	V	V	X	X	X	X	V	V	
EXT draw elements base vertex	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X	X	
EXT float blend	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X	X	
EXT multi draw arrays	X	X	X	X	X	X	X	X	X	V	V	V	V	V	V	V	V	V	
EXT multi draw indirect	X	X	X	X	X	X	X	X	X	V	V	X	X	X	V		X	X	
EXT multisampled render to texture	V	V	V	X	X	X	V	V	V	X	X	X	V	V	V	V	X	X	
EXT pvrtc sRGB	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X	X	X	X	
EXT polygon offset clamp	X	X	X	X	X	X	X	X	X	X	X	V	V	V	X		X	X	
EXT render snorm	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X		X	X	
EXT shader framebuffer fetch	X	X	V	V	V	V	X	X	X	X	X	V	V	V	X		X	X	
EXT shader group vote	X	X	X	X	X	X	X	X	X	X	X	V	V	V	X		X	X	
EXT shader pixel local storage	X	X	X	X	X	X	V	V	V	X	X	X	V	V	V	X		X	X
EXT shader pixel local storage2	X	X	X	X	X	X	X	X	X	X	X	V	V	V	X		X	X	
EXT sparse texture	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X		X	X	
EXT sparse texture2	X	X	X	X	X	X	X	X	X	X	V	X	X	X	X		X	X	
EXT sRGB write control	V	V	V	X	X	X	V	V	V	X	V	V	X	X	X		V	V	
EXT texture compression dxt1	X	X	X	X	X	X	X	X	X	V	V	V	X	X	X	V		V	V
EXT texture compression s3tc	X	X	X	X	X	X	X	X	X	V	V	V	X	X	X	X		X	X
EXT texture norm16	X	V	V	X	X	X	X	X	X	V	V	X	X	X	X		X	X	
EXT texture srgb decode	V	V	V	X	X	X	V	V	V	X	V	V	V	V	V	V	V	V	V
EXT texture srgb r8	X	V	V	X	X	X	X	X	X	X	X	X	V	V	X		X	X	
EXT texture srgb rg8	X	X	X	X	X	X	X	X	X	X	X	X	V	V	X		X	X	
EXT texture view	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X		X	X	
EXT yuv target	X	V	V	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Support	29%	29%	29%	14%	14%	14%	29%	29%	29%	14%	71%	71%	29%	29%	29%		43%	29%	29%

OpenGL ES OES extensions	Adreno			Apple			Mali			Mesa	Tegra		PowerVR		Vivante	Intel			
Architecture	300	400	500	6 6XT	7	600	700	800	Mesa	K1	X1	6 6XT	7 7000XS	B.T.	C.T.				
OES compressed paletted texture	X	X	X	X	X	X	V	V	V	X	X	X	X	X	X	V	V	V	
OES depth32	X	X	X	X	X	X	X	X	X	V	V	X	X	X	V		X	X	
OES_surfaceless_context	V	V	V	X	X	X	V	V	V	V	V	V	V	V	V	V	V	V	
OES texture view	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X		X	X	
OES texture compression astc	X	X	X	X	X	X	V	V	V	X	X	X	X	X	X		X	X	
OES texture float linear	X	V	V	X	X	X	X	X	X	V	V	X	X	X	X		V	V	
OES viewport array	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	
Support	0%	0%	0%	0%	0%	0%	50%	50%	50%	0%	50%	50%	0%	0%	0%		0%	0%	0%

OpenGL ES KHR extensions	Adreno			Apple			Mali			Mesa	Tegra		PowerVR		Vivante	Intel	
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Architecture	300	400	500	6 6XT	7 600	700	800	Mesa K1	X1	6 6XT	7 7000XS	B.T.	C.T.
<u>KHR_blend_equation_advanced_coherent</u>	X	V	V	V	V	V	X	V	V	X	V	V	X
<u>KHR_context_flush_control</u>	X	X	X	X	X	X	X	X	X	V	V	X	X
<u>KHR_no_error</u>	X	V	V	X	X	X	X	X	X	V	V	X	X
<u>KHR_robust_buffer_access_behaviour</u>	X	X	X	X	X	X	X	X	X	V	V	X	X
<u>KHR_texture_compression_astc_sliced_3d</u>	X	X	X	X	X	X	X	X	X	V	V	X	X
<u>KHR_texture_compression_astc_hdr</u>	X	X	V	X	X	X	V	V	V	X	X	X	X
Support	0%	33%	50%	17%	17%	17%	17%	33%	33%	0%	83%	83%	17%

OpenGL ES 3.2	Adreno			Apple			Mali			Mesa	Tegra	PowerVR		Vivante	Intel	
Architecture	300	400	500	6 6XT	7 600	700	800	Mesa K1	X1	6 6XT	7 7000XS	B.T.	C.T.			
OpenGL ES 3.2	X	X	V	X	X	X	X	X	X	V	V	X	V			
<u>KHR_blend_equation_advanced</u>	X	V	V	X	X	X	V	V	V	X	V	V	V			
<u>KHR_debug</u>	V	V	V	X	X	X	V	V	V	V	V	V	V			
<u>KHR_robustness</u>	X	X	X	X	X	X	X	X	X	V	V	X	V			
<u>KHR_texture_compression_astc_ldr</u>	X	V	V	X	V	V	V	V	V	V	V	X	V			
<u>OES_copy_image</u>	X	X	X	X	X	X	X	V	V	V	V	X	X			
<u>OES_draw_buffers_indexed</u>	X	X	X	X	X	X	X	V	V	V	V	V	V			
<u>OES_draw_elements_base_vertex</u>	X	X	X	X	X	X	X	V	V	V	V	X	V			
<u>OES_geometry_shader</u>	X	X	X	X	X	X	X	V	V	X	V	V	V			
<u>OES_geometry_point_size</u>	X	X	X	X	X	X	X	V	V	X	V	V	V			
<u>OES_gpu_shader5</u>	X	X	X	X	X	X	X	V	V	V	V	X	V			
<u>OES_primitive_bounding_box</u>	X	X	X	X	X	X	X	V	V	X	V	V	V			
<u>OES_sample_shading</u>	X	V	V	X	X	X	X	V	V	V	V	V	V			
<u>OES_sample_variables</u>	X	V	V	X	X	X	X	V	V	V	V	V	V			
<u>OES_shader_image_atomic</u>	X	V	V	X	X	X	V	V	V	V	V	V	V			
<u>OES_shader_io_blocks</u>	X	X	X	X	X	X	X	V	V	X	V	V	V			
<u>OES_shader_multisample_interpolation</u>	X	V	V	X	X	X	X	V	V	V	V	V	V			
<u>OES_tessellation_shader</u>	X	X	X	X	X	X	X	V	V	X	V	V	V			
<u>OES_tessellation_point_size</u>	X	X	X	X	X	X	X	V	V	X	V	V	V			
<u>OES_texture_border_clamp</u>	X	X	X	X	X	X	X	V	V	V	V	V	V			
<u>OES_texture_buffer</u>	X	X	X	X	X	X	X	V	V	V	V	V	V			
<u>OES_texture_cube_map_array</u>	X	X	X	X	X	X	X	V	V	X	V	V	V			
<u>OES_texture_stencil8</u>	X	V	V	X	X	X	V	V	V	V	V	V	V			
<u>OES_texture_storage_multisample_2d_array</u>	X	V	V	X	X	X	V	V	V	V	V	V	V			
<u>EXT_color_buffer_float</u>	V	V	V	X	X	X	X	V	V	V	V	V	V			
<u>EXT_draw_elements_base_vertex</u>	X	X	X	X	X	X	X	X	X	X	X	V	V			
<u>EXT_draw_buffers_indexed</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>EXT_geometry_point_size</u>	X	X	X	X	X	X	X	X	X	V	V	V	V			
<u>EXT_geometry_shader</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>EXT_gpu_shader5</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>EXT_primitive_bounding_box</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>EXT_robustness</u>	V	V	V	X	X	X	V	V	V	V	V	V	V			
<u>EXT_shader_io_blocks</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>EXT_tessellation_point_size</u>	X	X	X	X	X	X	X	X	X	V	V	V	V			
<u>EXT_tessellation_shader</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>EXT_texture_cube_map_array</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>EXT_texture_border_clamp</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>EXT_texture_buffer</u>	X	V	V	X	X	X	X	V	V	X	V	V	V			
<u>APPLE_copy_texture_levels</u>	X	X	X	V	V	V	X	X	X	X	X	X	X			

Support 4% 38% 42% 0% 4% 4% 25% 79% 79% 58% 100% 100% 42% 92% 92% 92% 33% 88%

OpenGL ES 3.1	Adreno			Apple			Mali			Mesa	Tegra	PowerVR			Vivante	Intel		
Architecture	300	400	500	6	6XT	7	600	700	800	Mesa	K1	X1	6	6XT	7	7000XS	B.T.	C.T.
OpenGL ES 3.1	X	V	V	X	X	X	V	V	V	V	V	V	V	V	V	V	V	V
<u>EXT separate shader objects</u>	X	X	X	V	V	V	X	X	X	X		V	V	V	V	V	X	V
<u>EXT shader integer mix</u>	X	X	X	X	X	X	X	X	X	X		V	V	X	X	X	X	V
Support	29%	29%	29%	14%	14%	14%	29%	29%	29%	14%	71%	71%	29%	29%	29%	43%	29%	29%

OpenGL ES 3.0	Adreno			Apple			Mali			Mesa	Tegra	PowerVR			Vivante	Intel		
Architecture	300	400	500	6	6XT	7	600	700	800	Mesa	K1	X1	6	6XT	7	7000XS	B.T.	C.T.
OpenGL ES 3.0	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES compressed_ETC1_RGB8_texture</u>	V	V	V	X	X	X	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES depth texture</u>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES depth24</u>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES element index uint</u>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES fbo render mipmap</u>	V	V	V	V	V	V	V	V	V	V	V	V	X	X	X	V	V	V
<u>OES get program binary</u>	V	V	V	X	X	X	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES packed depth stencil</u>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES rgb8_rgba8</u>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES standard derivatives</u>	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
<u>OES texture 3D</u>	V	V	V	X	X	X	V	V	V	V		X	X	X	X	X	V	V
<u>OES texture float</u>	V	V	V	V	V	V	X	X	X	X		V	V	V	V	V	V	V
<u>OES texture half float</u>	V	V	V	V	V	V	X	X	X	X		V	V	V	V	V	V	V
<u>OES texture half float linear</u>	V	V	V	V	V	V	X	X	X	X		V	V	V	V	V	V	V
<u>OES texture npot</u>	V	V	V	X	X	X	V	V	V	V		V	V	V	V	V	V	V
<u>OES vertex array object</u>	V	V	V	V	V	V	V	V	V	V		V	V	V	V	V	V	V
<u>OES vertex half float</u>	V	V	V	X	X	X	V	V	V	X		V	V	V	V	V	V	V
<u>OES vertex type 10 10 10 2</u>	V	V	V	X	X	X	X	X	X	X		V	V	X	X	X	V	X
<u>EXT blend minmax</u>	X	X	X	V	V	V	V	V	V	V		X	X	V	V	V	V	V
<u>EXT discard framebuffer</u>	V	V	V	V	V	V	V	V	V	V		X	X	V	V	V	V	V
<u>EXT draw buffers</u>	X	X	X	X	X	X	X	X	X	X		X	X	V	V	V	X	V
<u>EXT draw instanced</u>	X	X	X	V	V	V	X	X	X	X		X	X	X	X	X	X	V
<u>EXT frag depth</u>	X	X	X	X	X	X	X	X	X	X		V	V	X	X	X	V	V
<u>EXT instanced arrays</u>	X	X	X	V	V	V	X	X	X	X		X	X	X	X	X	X	V
<u>EXT map buffer range</u>	X	X	X	V	V	V	X	X	X	V		V	V	X	X	X	X	V
<u>EXT occlusion query boolean</u>	X	X	X	V	V	V	V	V	V	X		V	V	V	V	V	X	V
<u>EXT shadow samplers</u>	X	X	X	V	V	V	V	V	V	X		V	V	X	X	X	X	V
<u>EXT shader texture lod</u>	X	X	X	V	V	V	X	X	X	X		V	V	V	V	V	X	V
<u>EXT sRGB</u>	V	V	V	V	V	V	V	V	V	X		V	V	X	X	X	X	V
<u>EXT texture storage</u>	X	X	X	V	V	V	V	V	V	X		V	V	X	X	X	X	V
<u>EXT texture rg</u>	X	X	X	V	V	V	V	V	V	V		V	V	V	V	V	V	V
<u>EXT texture type 2 10 10 10 REV</u>	V	V	V	X	X	X	V	V	V	V		V	V	X	X	X	V	V
<u>EXT unpack subimage</u>	X	X	X	X	X	X	X	X	X	V		V	V	X	X	X	V	V
<u>IMG texture npot</u>	X	X	X	X	X	X	X	X	X	X		X	X	V	V	V	X	X
<u>NV copy buffer</u>	X	X	X	X	X	X	X	X	X	X		V	V	X	X	X	X	X
<u>NV draw buffers</u>	X	X	X	X	X	X	X	X	X	V		V	V	X	X	X	X	X
<u>NV draw instanced</u>	X	X	X	X	X	X	X	X	X	X		V	V	X	X	X	X	X
<u>NV explicit attrib location</u>	X	X	X	X	X	X	X	X	X	X		V	V	X	X	X	X	X
<u>NV fbo color attachments</u>	X	X	X	X	X	X	X	X	X	V		V	V	X	X	X	X	X

<u>NV sRGB formats</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV texture npot 2D mipmap</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV framebuffer blit</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV instanced arrays</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV non square matrices</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV pack subimage</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV packed float</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV read buffer</u>	X	X	X	X	X	X	X	X	X	V	V	V	X	X	X	X	X	X
<u>NV read depth stencil</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV texture array</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV generate mipmap sRGB</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>NV framebuffer multisample</u>	X	X	X	X	X	X	X	X	X	X	V	V	X	X	X	X	X	X
<u>APPLE texture max level</u>	X	X	X	V	V	V	X	X	X	V	X	X	X	X	X	V	V	V
<u>APPLE texture packed float</u>	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X	X	X	X
<u>APPLE sync</u>	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X	X	X	X
<u>APPLE framebuffer multisample</u>	X	X	X	V	V	V	X	X	X	X	X	X	X	X	X	X	X	X
Support	29%	29%	29%	14%	14%	14%	29%	29%	29%	14%	71%	71%	29%	29%	29%	43%	29%	29%