OpenGL Capabilities Tables

Developer

OpenGL Capabilities TablesThis table lists Legacy OpenGL extensions and parameter values reported for macOS 10.7.5. Click the name of a reported extension to view its specification.

HD Graphics 4000																	
HD Graphics 3000																	
GMA X3100																	
GMA 950																	
GeForce 650																	
Quadro FX 4800																	
GeForce 9400/285/320/330																	
Quadro FX 5600																	
GeForce 8600/8800/9600/120/130																	
Quadro FX 4500																	
GeForce 7300/7600																	
Radeon HD 5670/5750/5770/5870/6630/6750/6770/6970																	
Radeon HD 6490																	
Radeon HD 2600/4670/4850/4870																	
Radeon HD 2400																	
Radeon X1600/X1900																	
Software Renderer																	
OpenGL Version	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.4	2.1	2.1	2.1
GLSL Version	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
ARB_color_buffer_float	~		~	~	~	√			~	~	~	~	~			~	~
ARB_depth_buffer_float	~			~		<i>✓</i>				~	·	~				~	
ARB_depth_clamp	~		~	~	~	~	~	~	~	<i>'</i>	~	~	~			~	~
<u> </u>	~									-							
ARB_depth_texture		~	~	~	~	~	~	~	~	~	~	~	~	✓	~	~	~
ARB draw buffers	~	~	~	~	~	✓	~	~	✓	~	~	~	~		~	~	~
ARB draw elements base vertex	✓ ✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_draw_instanced			~	~	~	~			~	~	~	~	~	~		~	~
ARB_fragment_program	~	~	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~
ARB_fragment_program_shadow	~	~	~	~	~	✓	~	~	~	~	~	~	~	~	~	~	~
ARB_fragment_shader	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB framebuffer object	~		~	~	~	~			~	~	~	~	~			~	~
ARB_framebuffer_sRGB	~		~	~	~	~			~	~	~	~	~			~	~
ARB_half_float_pixel	~	✓	~	~	~	~	~	~	~	✓	~	~	~			~	~
ARB_half_float_vertex	~	✓	~	~	~	✓	~	~	~	~	~	~	~			✓	~
ARB_imaging	~	✓	~	~	~	✓	~	~	~	✓	~	~	~				
ARB_instanced_arrays	~	✓	~	✓	~	✓	~	~	~	✓	~	~	~	~	~	✓	~
ARB_multisample	~	✓	~	~	~	✓	~	~	~	✓	~	~	~	~	~	~	~
ARB_multitexture	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_occlusion_query	~	~	~	~	~	~	~	~	~	~	~	~	~		~	~	~
ARB pixel buffer object	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	✓	~
ARB point parameters	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_point_sprite	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_provoking_vertex	~	~	~	~	~	✓	~	✓	~	✓	~	~	~	~		~	~
ARB_seamless_cube_map	~		~	~	~	✓					~	~	~			~	~
ARB shader objects	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB shader texture lod	~	~	~	~	~	~	~	~	~	~	~	~	~			~	~
ARB shading language 100	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_shadow	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_shadow_ambient		~	~	~	~	· ·	*	•	*	•	*	*	· ·	·	•	•	·
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ADD	~																
ARB sync	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB texture border clamp	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
·	~																

ARB_texture_cube_map	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_texture_env_add	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_texture_env_combine	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB texture env crossbar	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB texture env dot3	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_texture_float	~	~	~	~	~	~	~	~	~	~	~	~	~			~	~
ARB_texture_mirrored_repeat	~	~	~	~	~	✓	~	~	~	~	~	~	~	~	~	~	~
ARB_texture_non_power_of_two	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_texture_rectangle	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB texture rg	~	~	~	~	~	~			~	~	~	~	~			~	~
ARB transpose matrix	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_vertex_array_bgra	~	~	~	~	~	~	~	~	~	~	~	~	~			~	~
ARB_vertex_blend	~	~	~	~	~	✓	~	~	~	~	~	~	~	~	~	~	~
ARB vertex buffer object	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB vertex program	_	✓	~	~		~	~	~	~	~	~	~	~	~	~	~	~
ARB_vertex_shader	~	~	~	~		~	~	~	~	~	~	~		~	~	~	~
ARB_window_pos	~	~	~	~	_	~	~	~	~	~	~	~	~	~	~	~	~
EXT abgr	~	~	~	~	~	~	~	~	~	~	~	· ·	~	~	~	·	<i>-</i>
EXT_bgra	~	~ ~	~	~	~	~ ~	· ·	~	~	~	~	· ·	~	~	~	~	✓
EXT_bindable_uniform	~	Ť	~	~	~	~	_	•	~	~	~	~	~	Ť		•	_
EXT_blend_color	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	✓
EXT_blend_equation_separate	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_blend_func_separate	<i></i>	~	~	~	~	~ ~	· ·	·	~	~	~	·	~	~	~	~	✓ ✓
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EXT blend minmax	~	~	~	~ ~	~	~ ~	· ·		~		~	~	<i>y</i>		~	~	✓ ✓
EXT_blend_subtract EXT_clip_volume_hint	~	~	· ·	~	· ·		· ·	✓ ✓	~	✓ ✓	~			~	~	✓ ✓	
	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_debug_label																	
EXT debug marker																	
EXT_depth_bounds_test	~						~	~	~	~	~	~	~				
EXT_draw_buffers2	~		~	~	~	~			~	~	~	~	~			~	✓
EXT_draw_range_elements	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_fog_coord	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT framebuffer blit	~	~	~	~	~	~			~	~	~	~	~		~	~	~
EXT framebuffer multisample	~	~	~	~	~	~			~	~	~	~	~			~	~
EXT_framebuffer_multisample_blit_scaled	~								~	~	~	~	~				
EXT_framebuffer_object	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_framebuffer_sRGB	~		~	~	~	~			~	~	~	~	~	~	~	~	~
EXT_geometry_shader4	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT gpu program parameters	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT gpu shader4	~		~	~	~	~			~	~	~	~	~			~	~
EXT_multi_draw_arrays	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_packed_depth_stencil	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT packed float	~		~	✓	~	~			~	~	~	~	~			~	~
EXT_provoking_vertex	~	~	~	✓	~	~	~	~	~	~	~	~	~	~		~	~
EXT_rescale_normal	~	~	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_secondary_color	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_separate_specular_color	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT shadow funcs	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT stencil two side	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_stencil_wrap	~	~	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_texture_array	~		~	~	~	~			~	~	~	~	~			~	~
EXT_texture_compression_dxt1	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_texture_compression_s3tc	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT texture env add	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT texture filter anisotropic	~	~	~	~	~	✓	~	~	~	~	~	~	~	~	~	~	~
EXT_texture_integer	~		~	~	~	✓			~	~	~	~	~			~	~

December																		
EXT_enter_enterpole	EXT_texture_lod_bias	~	~	~	~	~	~	~	✓	~	~	~	~	~	~	~	~	~
ET Testes alleved opcored For Testes and Secrete For			✓	~	✓	~	✓	~	~	~	~	~	~	~				
EXT_enter_ascr0_closeded	EXT_texture_rectangle	~	✓	~	✓	~	✓	~	~	~	✓	~	~	~	~	~	~	~
EXT_Inter_BROB_Lescole EXT_Transfare PROB_Lescole EXT_Tr	EXT_texture_shared_exponent	~		~	✓	~	✓			~	✓	~	~	~			~	~
EXT_angle_greey	EXT_texture_sRGB	~	✓	~	✓	~	✓	~	✓	~	✓	~	~	~	~	~	~	~
EXT Interface reposable V V V V V V V V V		~		~	~	~	✓			~	~	~	~	~			✓	~
EXT_MENT_AMPLE_BANG PLANS PREFER_AMPLE_BANG P	EXT_timer_query	~		~	~	~	~			~	~	~	~	~			~	~
APPLE poet planted	EXT_transform_feedback	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
APPEL Battle Library	EXT_vertex_array_bgra	~	✓	~	✓	~	✓	~	~	~	~	~	~	~			~	~
REPPLE famous array	APPLE_aux_depth_stencil	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
APPEL Floring brights	APPLE_client_storage	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
APPLE Incharbone V	APPLE element array	~	~	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~
APPLE_funds_contents_	APPLE_fence	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
APPLE Debter purposelbe APPLE public purposelbe APPLE public purposelbe APPLE public public	APPLE_float_pixels	~	~	~	~	~	✓	~	~	~	~	~	~	~			~	~
APPLE parked puteds	APPLE_flush_buffer_range	~	~	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~
APPEL packed pixels APPEL pac	APPLE_flush_render	~	~	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~
APPEL packed pixels APPEL pac	APPLE object purgeable		~	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
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APPLE precised wealth				~		~					~			~		~		
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APPEL yerbor program evaluators																		
APPLE Lychor 422	, _		√															
ATL-blend_equation_separate ATL-blend_weighted_minmax ATL-blend_weighted_																		
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ATI_texture_compression_3dc ATI_texture_float V V V V V V V V V V V V V V V V V V V		. ,		-		-												
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BM rasterpos clip																	·	~
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NV fragment program2 NV fragment program option NV light max exponent NV point sprite NV texagen reflection NV texture barrier NV vertex program3 SGI color matrix SGIS generate mipmap SGIS texture edge clamp SGIS texture edge clamp SGIS texture lod MAX_COLOR_ATTACHMENTS SV V V V V V V V V V V V V V V V V V V																		
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NV_texture_barrier V								~	~	~	~	~	~	~				
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NV vertex program2 option V <td>NV_texgen_reflection</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td> <td>~</td>	NV_texgen_reflection	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
NV vertex program3 Image: second content of the co	NV_texture_barrier																	
SGI color matrix ~	NV vertex program2 option							~	~	~	~	~	~	~				
SGIS generate mipmap V	NV_vertex_program3							~	~	~	~	~	~	~				
SGIS texture_edge_clamp V	SGI color matrix	~	✓	~	✓	~	~	~	~	~	~	~	~	~				
SGIS_texture_lod V	SGIS_generate_mipmap	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
MAX_COLOR_ATTACHMENTS 8 4 8 8 8 8 4 4 8 8 8 8 8 8 8 8 8 8 8	SGIS_texture_edge_clamp	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
	SGIS_texture_lod	~	✓	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~
	MAX_COLOR_ATTACHMENTS	8	4	8	8	8	8	4	4	8	8	8	8	8	1	8	8	8
	MAX_DRAW_BUFFERS	8	4	8	8	8	8	4	4	8	8	8	8	8	1	8	8	8

MAY DENDEDDI IEEED CIZE	16207	1006	0100	9100	16204	16204	4006	4006	0100	0100	9102	9102	16204	2049	20/10	9102	16204
MAX_RENDERBUFFER_SIZE	16384 16	4096	8192	8192	16384	16384	4096	4096	8192	8192	8192	8192	16384	2048	2048	8192	16384
MAX_SAMPLES																	
MAX_VIEWPORT_DIMS	16384 16384	4096 4096	8192 8192	8192 8192	16384 16384	16384 16384	4096 4096	4096 4096	8192 8192	8192 8192	8192 8192	8192 8192	16384 16384	2048 2048	2048 2048	8192 8192	16384 16384
MIN_PBUFFER_VIEWPORT_DIMS_APPLE	1	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	2	2	2	2
SUBPIXEL BITS	10	7	8	8	8	8	12	12	8	8	8	8	8	4	4	8	8
ALIASED_LINE_WIDTH_RANGE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	64.0	64.0	64.0	64.0	64.0	64.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0	7.0	7.0
ALIASED_POINT_SIZE_RANGE	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 63.0	1.0 63.0	1.0 63.0	1.0 63.0	1.0 63.0	1.0	1.0 63.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0
SMOOTH_LINE_WIDTH_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.5	0.5	0.125	0.125
SMOOTH_LINE_WIDTH_RANGE	0.1	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.125	0.125
	64.0 0.0001	64.0 0.125	64.0 0.125	64.0 0.125	64.0 0.125	64.0 0.125	10.0 0.125	7.0 0.125	7.0 0.125	7.0 0.125	7.0 0.125						
SMOOTH_POINT_SIZE_GRANULARITY																	
SMOOTH_POINT_SIZE_RANGE	0.1 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 63.375	1.0 64.0	1.0 64.0	0.125 64.0	0.125 64.0						
MAX_TEXTURE_SIZE	16384	4096	8192	8192	16384	16384	4096	4096	8192	8192	8192	8192	16384	2048	2048	8192	16384
MAX_RECTANGLE_TEXTURE_SIZE_EXT	16384	4096	8192	8192	16384	16384	4096	4096	8192	8192	8192	8192	16384	2048	2048	8192	16384
MAX_3D_TEXTURE_SIZE	16384	4096	8192	8192	16384	16384	512	512	2048	2048	2048	2048	2048	128	128	2048	2048
MAX_CUBE_MAP_TEXTURE_SIZE	16384	4096	8192	8192	16384	16384	4096	4096	8192	8192	8192	8192	16384	1024	1024	8192	16384
MAX_ARRAY_TEXTURE_LAYERS_EXT	16384	0	512	512	512	512	0	0	512	512	512	512	2048	0	0	512	512
MAX_TEXTURE_LOD_BIAS	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	16.0	16.0	16.0	16.0
MAX_TEXTURE_MAX_ANISOTROPY_EXT	16	16	16	16	16	16	16	16	16	16	16	16	16	4	16	16	16
MAX_TEXTURE_UNITS	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
NUM_COMPRESSED_TEXTURE_FORMATS	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3
	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1	DXT1
	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3	DXT3
	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5	DXT5
MAY ATTRIR OTA OK DERTH	3Dc	3Dc	3Dc	3Dc	3Dc	3Dc	10	10	10	40	40	10	10	40	10	10	40
MAX_ATTRIB_STACK_DEPTH	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_CLIENT_ATTRIB_STACK_DEPTH	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_COLOR_MATRIX_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_MODELVIEW_STACK_DEPTH	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_NAME_STACK_DEPTH	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_PROGRAM_MATRIX_STACK_DEPTH_ARB	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
MAX_PROJECTION_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_TEXTURE_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_PROGRAM_ADDRESS_REGISTERS_ARB	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
MAX_PROGRAM_ATTRIBS_ARB	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_PROGRAM_ENV_PARAMETERS_ARB	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256
MAX_PROGRAM_INSTRUCTIONS_ARB	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K
MAX_PROGRAM_LOCAL_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_MATRICES_ARB	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_PROGRAM_NATIVE_ADDRESS_REGISTERS_ARB	1	1	1	1	1	1	2	2	2	2	2	2	2	0	1	1	1
MAX PROGRAM NATIVE ATTRIBS ARB	32	16	16	16	16	16	16	16	16	16	16	16	16	0	18	18	18
MAX_PROGRAM_NATIVE_INSTRUCTIONS_ARB	256K	256	4096	4096	4096	4096	512	512	16384	65536	16384	65536	16384	0	16384	16384	16384
MAX_PROGRAM_NATIVE_PARAMETERS_ARB	1024	256	256	256	256	256	256	256	1024	1024	1024	1024	1024	0	512	512	512
MAX_PROGRAM_NATIVE_TEMPORARIES_ARB	65535	32	64	64	64	64	48	48	4096	4096	4096	4096	4096	0	100	100	1024
MAX_PROGRAM_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
														65535			65535
MAX_PROGRAM_TEMPORARIES_ARB	65535 0	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535		65535	65535	
MAX_PROGRAM_CALL_DEPTH_NV	-	0	4	4	4	4	8	8	32	32	32	32	32	0	0	4	4
MAX_PROGRAM_EXEC_INSTRUCTIONS_NV	0	0	4096	4096	4096	4096	65536	65536	16M	16M	16M	16M	16M	0	0	65536	65536
MAX_PROGRAM_ALU_INSTRUCTIONS_ARB	256K	512	2048	2048	2048	2048	4096	32768	16384	65536	16384	65536	16384	64	16384	16384	16384
MAX_PROGRAM_ATTRIBS_ARB	32	10	10	10	10	10	16	16	16	16	16	16	16	11	18	18	18
MAX_PROGRAM_ENV_PARAMETERS_ARB	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_PROGRAM_INSTRUCTIONS_ARB	256K	1024	4096	4096	4096	4096	4096	32768	16384	65536	16384	65536	16384	96	16384	16384	16384
MAX_PROGRAM_LOCAL_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024

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	05011	E40	0040	00.40	0040	00.40	1000	22722	40004	05500	10001	05500	40004	0.4	10001	10001	10001
MAX_PROGRAM_NATIVE_ALU_INSTRUCTIONS_ARB	256K	512	2048	2048	2048	2048	4096	32768	16384	65536	16384	65536	16384	64	16384	16384	16384
MAX_PROGRAM_NATIVE_ATTRIBS_ARB	32	10	10	10	10	10	16	16	16	16	16	16	16	11	18	18	18
MAX_PROGRAM_NATIVE_INSTRUCTIONS_ARB	256K	1024	4096	4096	4096	4096	4096	32768	16384	65536	16384	65536	16384	96	16384	16384	16384
MAX_PROGRAM_NATIVE_PARAMETERS_ARB	1024	64	256	256	256	256	1024	1024	1024	1024	1024	1024	1024	32	512	512	512
MAX_PROGRAM_NATIVE_TEMPORARIES_ARB	65535	64	64	64	64	64	32	32	4096	4096	4096	4096	4096	16	1024	1024	1024
MAX_PROGRAM_NATIVE_TEX_INDIRECTIONS_ARB	256K	4	2048	2048	2048	2048	4096	32768	16384	65536	16384	65536	16384	4	16384	16384	16384
MAX_PROGRAM_NATIVE_TEX_INSTRUCTIONS_ARB	256K	512	2048	2048	2048	2048	4096	32768	16384	65536	16384	65536	16384	32	16384	16384	16384
MAX_PROGRAM_PARAMETERS_ARB	1024	64	256	256	256	256	1024	1024	1024	1024	1024	1024	1024	32	512	512	512
MAX_PROGRAM_TEMPORARIES_ARB	65535	64	64	64	64	64	32	32	4096	4096	4096	4096	4096	16	1024	1024	1024
MAX_PROGRAM_TEX_INDIRECTIONS_ARB	256K	4	2048	2048	2048	2048	4096	32768	16384	65536	16384	65536	16384	4	16384	16384	16384
MAX_PROGRAM_TEX_INSTRUCTIONS_ARB	256K	512	2048	2048	2048	2048	4096	32768	16384	65536	16384	65536	16384	32	16384	16384	16384
MAX_PROGRAM_CALL_DEPTH_NV	0	0	4	4	4	4	4	4	32	32	32	32	32	0	0	4	4
MAX_PROGRAM_EXEC_INSTRUCTIONS_NV	0	0	4096	4096	4096	4096	65536	65536	16M	16M	16M	16M	16M	0	0	65536	65536
MAX_PROGRAM_IF_DEPTH_NV	0	0	32	32	32	32	48	48	64	64	64	64	64	0	0	48	48
MAX_PROGRAM_LOOP_COUNT_NV	0	0	255	255	255	255	255	255	16M	16M	16M	16M	16M	0	0	255	255
MAX_PROGRAM_LOOP_DEPTH_NV	0	0	32	32	32	32	4	4	64	64	64	64	64	0	0	32	32
MAX_COMBINED_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_FRAGMENT_UNIFORM_COMPONENTS	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
MAX TEXTURE COORDS	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VARYING_FLOATS	128	40	128	128	128	128	32	32	60	60	60	60	124	32	60	60	60
MAX_VERTEX_ATTRIBS	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_UNIFORM_COMPONENTS	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
MAX_GEOMETRY_OUTPUT_VERTICES_EXT	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX GEOMETRY TEXTURE IMAGE UNITS EXT	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_GEOMETRY_TOTAL_OUTPUT_COMPONENTS_EXT	4096	4096	4096	4096	16384	16384	4096	4096	1024	1024	1024	1024	1024	4096	4096	4096	4096
MAX_GEOMETRY_UNIFORM_COMPONENTS_EXT	4096	4096	4096	4096	10364	10384	4096	4096	2048	2048	2048	2048	2048	4096	4096	4096	4096
MAX GEOMETRY VARYING COMPONENTS EXT	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_VARYING_COMPONENTS_EXT	128	40	128	128	128	128	32	32	60	60	60	60	124	32	60	60	60
MAX VERTEX VARYING COMPONENTS EXT	128	40	128	128	128	128	128	128	64	64	64	64	128	32	60	64	64
	-8	0	-8	-8	-8	-8	0	0	-8	-8	-8	-8	-8	0	0	-8	-8
MIN_PROGRAM_TEXEL_OFFSET_EXT	7	0		7	7	7	0	0	7	-	7	7	7	0	0	7	7
MAX_PROGRAM_TEXEL_OFFSET_EXT	64	64	7 512		512		64	-	64	7	64	64	64	64	64		64
MAX_XFB_INTERLEAVED_COMPONENTS_EXT	-			512 4		512		64		-	4					64	-
MAX_XFB_SEPARATE_ATTRIBS_EXT	16	16	4	4	4	4	16 32	16	4	4		4	4	16	16	16	16
MAX_XFB_SEPARATE_COMPONENTS_EXT	32	32	4				-	32	16	16	16	16	16	32	32	32	32
PRIMITIVES_GENERATED_EXT (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
XFB_PRIMITIVES_WRITTEN_EXT (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_BINDABLE_UNIFORM_SIZE_EXT	1M	0	65536	65536	65536	65536	0	0	65536	65536	65536	65536	65536	0	0	0	0
MAX_VERTEX_BINDABLE_UNIFORMS_EXT	256	0	12	12	12	12	0	0	12	12	12	12	12	0	0	0	0
MAX_GEOMETRY_BINDABLE_UNIFORMS_EXT	256	0	12	12	12	12	0	0	12	12	12	12	12	0	0	0	0
MAX_FRAGMENT_BINDABLE_UNIFORMS_EXT	256	0	12	12	12	12	0	0	12	12	12	12	12	0	0	0	0
MAX_CLIP_PLANES	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
MAX_CONVOLUTION_HEIGHT	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
MAX_CONVOLUTION_WIDTH	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
MAX_ELEMENTS_INDICES	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000
MAX_ELEMENTS_VERTICES	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M
MAX_EVAL_ORDER	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_LIGHTS	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_LIST_NESTING	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
MAX_PIXEL_MAP_TABLE	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256
MAX_SHININESS_NV	128	128	128	128	128	128	1024	1024	1024	1024	1024	1024	1024	128	128	128	128
MAX_SPOT_EXPONENT_NV	128	128	128	128	128	128	1024	1024	1024	1024	1024	1024	1024	128	128	128	128
MAX_VERTEX_ARRAY_RANGE_ELEMENT_APPLE	1M	65535	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	65535	65535	65535	65535
MAX_VERTEX_UNITS_ARB	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
QUADS_FOLLOW_PROVOKING_VERTEX_CONVENTION	1	0	1	1	1	1	0	0	1	1	1	1	1	1	0	0	0

SAMPLES PASSED (query bits)	32	32	63	63	63	63	32	32	32	32	32	32	32	0	32	64	64
TIME_ELAPSED_EXT (query bits)	32	-	63	63	63	63	-	-	32	32	32	32	32	-	-	64	64
MAX_SERVER_WAIT_TIMEOUT	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E
Off Screen	~																
Full Screen		✓	~	✓	~	✓	~	✓	~	✓	~	~	~	~	~	~	~
Hardware Accelerated		✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Robust	~																
Backing Store	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
MP Safe	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Window	~	✓	~	✓	~	~	~	~	~	~	~	~	~	✓	~	~	~
Multi Screen	~																
Compliant	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Monoscopic	~	✓	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Stereoscopic		~	~	~	~	~	~	~	~	~	~	~					
Single Buffer	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Double Buffer	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Color Buffer Modes (bpp RGB-A)	24-8	15-1 24-8 48-16	15-1 24-8 30-2 48-16	15-1 24-8 30-2 48-16	15-1 24-8 30-2 48-16	15-1 24-8 30-2 48-16	15 24-8	15-1 24-8	24-8	24-8 48-16h	24-8 48-16h						
	96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f			96-32f	96-32f
Accum Buffer Modes (bpp RGB-A)	96-32f	24-8 48-16	96-32f	96-32f	96-32f	96-32f	24-8 48-16	24-8 48-16	96-32f	96-32f	96-32f	96-32f	96-32f	24-8 48-16	24-8 48-16	96-32f	96-32f
Depth Buffer Modes (bpp)	0	0	0	0	0	0 16	0	0	0	0 16	0	0 16	0	0	0	0	0
	32	16 24 32	16 24 32	16 24 32	16 24 32	24	16 24	24	24	24	16 24	24	16 24	16 24	16 24	24	24
Stencil Buffer Modes (bpp)	32 0 8	24	24	24	24	24										0 8	0 8
Stencil Buffer Modes (bpp) Max Aux Buffers	0	24 32 0	24 32 0	24 32 0	24 32 0	24 32 0	24	0	0	0	0	0	0	0	0	0	0
	0	24 32 0 8	24 32 0 8	24 32 0 8	24 32 0 8	24 32 0 8	24 0 8	24 0 8	24 0 8	24 0 8	0 8	24 0 8	24 0 8	24 0 8	24 0 8	0	0 8
Max Aux Buffers	0 8 4	24 32 0 8 2	24 32 0 8 2	24 32 0 8 2	24 32 0 8 2	24 32 0 8 2	24 0 8 2	0 8 2	0 8 2								
Max Aux Buffers Max Sample Buffers	0 8 4 1	24 32 0 8 2	24 32 0 8 2	24 32 0 8 2	24 32 0 8 2	24 32 0 8 2	24 0 8 2	24 0 8 2	24 0 8 2	24 0 8 2 1	24 0 8 2 1	24 0 8 2 1	24 0 8 2	24 0 8 2	24 0 8 2	0 8 2 1	0 8 2 1
Max Aux Buffers Max Sample Buffers Max Samples	0 8 4 1 16	24 32 0 8 2 1	24 32 0 8 2 1	24 32 0 8 2 1	24 32 0 8 2 1	24 32 0 8 2 1	24 0 8 2	24 0 8 2	24 0 8 2	24 0 8 2 1	24 0 8 2 1	24 0 8 2 1	24 0 8 2	24 0 8 2	24 0 8 2	0 8 2 1	0 8 2 1
Max Aux Buffers Max Sample Buffers Max Samples Supersampling	0 8 4 1 16	24 32 0 8 2 1 6	24 32 0 8 2 1 4	24 32 0 8 2 1 8	24 32 0 8 2 1 4	24 32 0 8 2 1 8	24 0 8 2 1 4	24 0 8 2 1 4	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2	24 0 8 2	0 8 2 1 4	0 8 2 1 8
Max Aux Buffers Max Sample Buffers Max Samples Supersampling Multisampling	0 8 4 1 16 ~	24 32 0 8 2 1 6	24 32 0 8 2 1 4	24 32 0 8 2 1 8	24 32 0 8 2 1 4	24 32 0 8 2 1 8	24 0 8 2 1 4	24 0 8 2 1 4	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2	24 0 8 2	0 8 2 1 4	0 8 2 1 8
Max Aux Buffers Max Sample Buffers Max Samples Supersampling Multisampling Alphasampling	0 8 4 1 16 ~	24 32 0 8 2 1 6 ~	24 32 0 8 2 1 4 ~	24 32 0 8 2 1 8 ~	24 32 0 8 2 1 4 ~	24 32 0 8 2 1 8 ~	24 0 8 2 1 4	24 0 8 2 1 4	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2	24 0 8 2 0 0	0 8 2 1 4	0 8 2 1 8
Max Aux Buffers Max Sample Buffers Max Samples Supersampling Multisampling Alphasampling GPU Vertex Processing	0 8 4 1 16 ~	24 32 0 8 2 1 6 ~	24 32 0 8 2 1 4 ~	24 32 0 8 2 1 8 ~ ~	24 32 0 8 2 1 4 ~	24 32 0 8 2 1 8 ~ ~	24 0 8 2 1 4	24 0 8 2 1 4	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 1 8	24 0 8 2 0 0	24 0 8 2 0 0	0 8 2 1 4	0 8 2 1 8

- This data describes functionality only. Actual rendering results may differ across renderers with identical reported capabilities; always verify your results on the real hardware.
- Renderers based on the same chipset (variants such as Pro/Mobility) are condensed into single columns here. The exported capabilities are identical, the performance differs.
 SGI_color_matrix functionality is implied by ARB_imaging, but
- SGI_color_matrix functionality is implied by ARB_imaging, but not exported on renderers marked by "~"
- EXT_separate_specular_color functionality is implied by OpenGL 1.2, but not exported on renderers marked by "~"
- ARB_multisample functionality is implied by OpenGL 1.3, but not exported on renderers marked by "~"

OpenGL Capabilities TablesThis table lists Legacy OpenGL extensions and parameter values reported for macOS 10.8.5. Click the name of a reported extension to view its specification.

HD Graphics 5000/Iris													
HD Graphics 4000													
HD Graphics 4000													
GeForce 640/650/660/675/680/750/755/775/780													
Quadro FX 4800													
GeForce 9400/285/320/330													
Quadro FX 5600													
GeForce 8600/8800/9600/120/130													
Radeon HD 5670/5750/5770/5870/6630/6750/6770/6970													
Radeon HD 6490													
Radeon HD 2600/4670/4850/4870													
Radeon HD 2400													
Software Renderer													
OpenGL Version	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
GLSL Version	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
ARB color buffer float	v	1.20 ✓	· · · · · · · · · · · · · · · · · · ·	1.20 ✓	√	1.20 ✓	1.20 ✓	1.20 ✓	·/	1.20 ✓	v	1.20 ✓	√
ARB depth buffer float	~	· ·	~	~		~	✓ ✓	·	~	· ·	~	· ·	✓ ✓
	~	~	~	· /	✓ ✓	~	~ ~	· ·	~	· /	~	~	~
ARB depth clamp	~	· ·		· ·		~	~ ~				~		
ARB depth texture			~		~			/	~	~		~	~
ARB_draw_buffers	✓ ✓	~	~	~	~	~	✓ ·	~	~	~	~	~	~
ARB_draw_elements_base_vertex		~	~	~	✓	~	✓	~	~	~	✓ ·	~	✓
ARB_draw_instanced	✓	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_fragment_program	✓	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB_fragment_program_shadow	✓	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB_fragment_shader	~	~	✓	~	~	~	✓	~	~	~	~	~	✓
ARB_framebuffer_object	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB framebuffer sRGB	~	~	✓	~	~	~	~	~	~	~	~	~	✓
ARB half float pixel	~	~	~	~	~	~	✓	~	~	~	✓	~	~
ARB half float vertex	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB_imaging	~	~	~	~	~	~	✓	~	~	~			
ARB_instanced_arrays	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB_multisample	~	~	~	~	~	~	✓	~	~	~	✓	~	~
ARB_multitexture	✓	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_occlusion_query	~	~	~	~	~	~	✓	~	~	~	✓	~	~
ARB_pixel_buffer_object	✓	~	✓	~	✓	~	✓	~	~	~	✓	~	✓
ARB_point_parameters	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB point sprite	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB_provoking_vertex	~	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_seamless_cube_map	~	~	✓	~	~			~	✓	~	✓	~	✓
ARB_shader_objects	~	~	✓	~	✓	~	✓	~	✓	~	✓	~	✓
ARB_shader_texture_lod	~	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_shading_language_100	~	~	~	~	~	~	~	~	~	~	~	~	✓

ARB_shadow	✓	~	✓	✓	✓	~	✓	✓	✓	~	✓	✓	✓
ARB_shadow_ambient	~	~	✓	✓	✓								
ARB_sync	✓	✓	✓	✓	✓	~	✓	~	✓	~	✓	✓	✓
ARB_texture_border_clamp	~	~	✓	✓	✓	~	✓	~	~	~	✓	~	✓
ARB_texture_compression	~	~	✓	✓	✓	~	✓	~	~	~	✓	~	✓
ARB_texture_compression_rgtc	~	~	✓	✓	~	~	~	~	~	~	~	~	✓
ARB_texture_cube_map	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB_texture_env_add	~	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_texture_env_combine	~	~	✓	~	✓	~	✓	~	~	~	✓	~	✓
ARB_texture_env_crossbar	~	~	✓	~	✓	~	✓	~	~	~	~	~	✓
ARB texture env dot3	~	~	✓	~	✓	~	✓	~	~	~	✓	~	✓
ARB_texture_float	~	~	✓	~	~	~	✓	~	~	~	✓	✓	✓
ARB_texture_mirrored_repeat	~	~	~	~	✓	~	✓	~	✓	~	~	~	✓
ARB_texture_non_power_of_two	~	~	✓	~	✓	~	✓	~	✓	~	✓	~	✓
ARB_texture_rectangle	~	~	~	~	~	~	✓	~	~	~	~	✓	✓
ARB_texture_rg	~	~	~	~	✓	~	✓	~	~	~	~	~	~
ARB_transpose_matrix	~	~	~	~	✓	~	✓	~	~	~	~	~	✓
ARB_vertex_array_bgra	~	~	✓	~	✓	~	✓	~	~	~	✓	~	✓
ARB_vertex_blend	~	~	✓	~	✓	~	✓	~	~	~	✓	~	✓
ARB_vertex_buffer_object	~	~	✓	~	~	~	✓	~	~	~	~	✓	✓
ARB vertex program	~	~	✓	~	✓	~	✓	~	~	~	✓	~	✓
ARB_vertex_shader	~	~	✓	~	~	~	✓	~	~	~	~	✓	✓
ARB_window_pos	~	~	~	~	✓	~	✓	~	~	~	~	~	✓
EXT abgr	~	~	✓	~	~	~	✓	~	~	~	✓	~	✓
EXT_bgra	~	~	✓	~	~	~	✓	~	~	~	✓	~	✓
EXT bindable uniform	~	~	✓	~	~	~	✓	~	~	~			
EXT_blend_color	~	~	~	~	✓	~	✓	~	~	~	~	~	✓
EXT blend equation separate	~	~	✓	~	~	~	✓	~	~	~	~	~	✓
EXT_blend_func_separate	~	~	~	~	~	~	✓	~	~	~	~	~	✓
EXT_blend_minmax	~	~	~	~	✓	~	✓	~	~	~	~	~	✓
EXT_blend_subtract	~	~	~	~	✓	~	✓	~	~	~	~	~	✓
EXT_clip_volume_hint	~	~	~	~	~	~	✓	~	~	~	~	~	✓
EXT_debug_label													
EXT debug marker													
EXT depth bounds test	~					~	✓	~	~	~			
EXT draw buffers2	~	~	✓	~	✓	~	✓	~	~	~	~	~	✓
EXT_draw_range_elements	~	~	~	~	✓	~	✓	~	~	~	~	~	✓
EXT_fog_coord	~	~	✓	~	~	~	✓	~	~	~	~	✓	✓
EXT_framebuffer_blit	~	~	~	~	✓	~	~	~	~	~	~	~	~
EXT_framebuffer_multisample	~	~	~	~	✓	~	✓	~	~	~	~	~	~
EXT_framebuffer_multisample_blit_scaled	~					~	✓	~	~	~			
EXT_framebuffer_object	~	~	~	~	✓	~	~	~	~	~	~	~	~
EXT_framebuffer_sRGB	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT geometry shader4	~	~	✓	~	✓	~	~	~	~	~	~	~	~
EXT gpu program parameters	~	~	~	~	✓	~	~	~	~	~	~	~	~
EXT gpu shader4	~	~	✓	~	✓	~	~	~	~	~	~	~	~

EXT multi draw arrays	✓	✓	~	✓	~	~	✓	✓	~	~	✓	✓	✓
EXT packed depth stencil	~	~	~	~	~	~	~	✓	~	~	✓	~	✓
EXT_packed_float	~	~	~	~	~	~	~	✓	~	~	✓	~	✓
EXT_provoking_vertex	✓	✓	~	✓	✓	~	~	~	~	~	~	✓	✓
EXT_rescale_normal	✓	✓	~	~	✓	~	~	~	~	~	~	~	✓
EXT_secondary_color	~	~	~	~	✓	~	~	~	~	~	~	~	~
EXT_separate_specular_color	✓	~	~	✓	~	✓	✓						
EXT_shadow_funcs	✓	✓	~	~	✓								
EXT_stencil_two_side	✓	✓	~	✓	✓	~	~	✓	~	~	✓	~	✓
EXT_stencil_wrap	✓	✓	✓	✓	✓	~	~	~	~	~	✓	~	✓
EXT_texture_array	✓	✓	✓	✓	✓	~	✓	~	~	~	✓	~	✓
EXT_texture_compression_dxt1	✓	✓	~	✓	✓	~	✓	✓	~	~	✓	✓	✓
EXT_texture_compression_s3tc	✓	✓	~	✓	✓	~	✓	~	~	~	~	~	~
EXT_texture_env_add	✓	~	✓	~	~	~	~	~	~	~	~	✓	✓
EXT_texture_filter_anisotropic	~	✓	~	~	✓	~	~	~	~	~	~	~	~
EXT_texture_integer	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_texture_lod_bias	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_texture_mirror_clamp	✓	~	✓	✓	✓	~	~	~	✓	~			
EXT_texture_rectangle	~	~	~	~	~	~	~	~	~	~	~	~	✓
EXT texture shared exponent	~	~	~	~	~	~	~	~	~	~	~	~	✓
EXT texture sRGB	~	~	~	~	✓	~	~	~	~	~	~	~	~
EXT_texture_sRGB_decode	✓	~	~	~	✓	~	✓	~	~	~	~	~	✓
EXT_timer_query	✓	✓	~	~	~								
EXT_transform_feedback	~	~	~	~	~	~	~	~	~	~	✓	~	✓
EXT_vertex_array_bgra	~	~	~	~	~	~	~	~	~	~	~	~	~
APPLE aux depth stencil	~	~	~	~	~	~	~	~	~	~	~	~	✓
APPLE_client_storage	~	~	~	~	✓	~	~	~	~	~	~	~	~
APPLE element array	~	~	~	~	✓	✓	✓	✓	~	~	~	✓	✓
APPLE_fence	~	~	~	✓	✓	~	✓	~	~	~	~	~	✓
APPLE_float_pixels	✓	✓	~	✓	✓	~	~	✓	~	~	~	~	✓
APPLE_flush_buffer_range	✓	✓	~	✓	✓	~	✓	~	~	~	✓	~	✓
APPLE_flush_render	~	~	~	✓	✓	~	✓	~	~	~	~	~	✓
APPLE_object_purgeable		~	~	~	~	~	~	~	~	~	✓	✓	~
APPLE packed pixels	~	~	~	~	~	~	~	~	~	~	✓	~	~
APPLE_pixel_buffer	~	~	~	~	~	~	~	~	~	~	✓	✓	✓
APPLE rgb 422	~	~	~	~	~	~	~	~	~	~	✓	~	✓
APPLE_row_bytes	~	~	~	~	~	~	~	~	~	~	✓	✓	✓
APPLE specular vector	~	~	~	~	~	~	~	~	~	~	✓	✓	✓
APPLE_texture_range	✓	~	~	✓	~	~	~	✓	~	~	✓	✓	✓
APPLE_transform_hint	~	~	~	~	~	~	~	✓	~	~	✓	~	~
APPLE_vertex_array_object	✓	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓	✓
APPLE_vertex_array_range	~	~	~	✓	~	~	~	~	~	~	✓	✓	✓
APPLE_vertex_point_size	✓	~	✓	✓	✓	✓	✓	✓	✓	~	✓	✓	✓
APPLE vertex program evaluators	~	✓	~	~	~	~	✓	~	~	~	✓	~	✓
APPLE votor 422	·	<u> </u>	~	· ·	~	/	~	·	~	~	✓	✓	·
ATI_blend_equation_separate		· /	~	~	~								
s.s.s_oquation_oopulato													

ATI_blend_weighted_minmax		~	~	~	~			_		<u> </u>			
ATI separate stencil	~	<u> </u>	-	· /	~	~	~	~	~	~	~	~	~
ATI_texture_compression_3dc	~	<u> </u>	~	· /	~								
ATI texture env combine3	~	<u> </u>	~	· /	~	~	~	~	✓	~	✓	~	✓
ATI_texture_float	~	· /	~	· /	~	· ·	~	*	~	*	*	*	~
ATI_texture_mirror_once	✓	~	~	~	✓	~	~	✓	~	~	~	~	~
IBM rasterpos clip	~	· ·	~	· ·	~	·	~	~	~	/	· /	-	·
NV_blend_square	~	~	~	~	~	~	~	~	~	~	~	~	·
NV_conditional_render	~	~	~	· ·	~	· ·	~	~	· /	~	· /	~	·
NV_depth_clamp	~	<u> </u>	~	· ·	~	~	~	~	~	~	· /	· ·	· ·
		<u> </u>	~	*	· ·	~	~	*	~	~	~	~	~ ~
NV frog distance	~	~	~	~	~						~	~	~
NV fragment_program2						✓ ·	~	~	~	~			
NV fragment program option		,	,			✓ ·	~	V	V	~	,		
NV light_max_exponent	~	~	~	~	✓	~	✓	V	✓	~	✓	~	~
NV multisample filter hint						~	~	V	V	~			
NV_point_sprite	~		,		,	~	~	V	~	~	,		,
NV_textgen_reflection	~	~	~	~	~	~	~	✓	~	~	~	~	~
NV_texture_barrier									,	,			
NV_vertex_program2_option						~	✓	✓	✓	~			
NV vertex_program3						~	✓	✓	~	~			
SGI_color_matrix	~	~	~	~	✓	~	~	~	~	~			
SGIS_generate_mipmap	~	~	~	~	~	~	~	✓	~	~	~	~	✓
SGIS_texture_edge_clamp	~	~	~	~	✓	~	~	✓	~	~	✓	~	✓
SGIS_texture_lod	~	~	~	~	✓	~	~	~	~	~	~	~	~
MAX_COLOR_ATTACHMENTS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_DRAW_BUFFERS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_RENDERBUFFER_SIZE	16384	8192	8192	16384	16384	8192	8192	8192	8192	16384	8192	16384	16384
MAX_SAMPLES	16	4	8	4	8	8	8	8	8	8	4	8	8
MAX_VIEWPORT_DIMS	16384 16384	8192 8192	8192 8192	16384 16384	16384 16384	8192 8192	8192 8192	8192 8192	8192 8192	16384 16384	8192 8192	16384 16384	16384 16384
MIN_PBUFFER_VIEWPORT_DIMS_APPLE	1	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	2 2	2 2	2 2
SUBPIXEL_BITS	10	8	8	8	8	8	8	8	8	8	8	8	8
ALIASED_LINE_WIDTH_RANGE	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 10.0	1.0	1.0 10.0	1.0 10.0	1.0 10.0	1.0 7.0	1.0 7.0	1.0 7.0
ALIASED_POINT_SIZE_RANGE	1.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 63.0	1.0	1.0 63.0	1.0 63.0	1.0 63.0	1.0 64.0	1.0 64.0	1.0 64.0
SMOOTH_LINE_WIDTH_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
SMOOTH_LINE_WIDTH_RANGE	0.1 64.0	1.0	1.0	1.0	1.0	0.5 10.0	0.5 10.0	0.5 10.0	0.5 10.0	0.5 10.0	0.125 7.0	0.125 7.0	0.125 7.0
SMOOTH_POINT_SIZE_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
SMOOTH_POINT_SIZE_RANGE	0.0001	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.125	0.125	0.125
	64.0	64.0	64.0	64.0	64.0	63.375	63.375	63.375	63.375	63.375	64.0	64.0	64.0
MAX_TEXTURE_SIZE	16384	8192	8192	16384	16384	8192	8192	8192	8192	16384	8192	16384	16384
MAX_RECTANGLE_TEXTURE_SIZE_EXT	16384	8192	8192	16384	16384	8192	8192	8192	8192	16384	8192	16384	16384
MAX_3D_TEXTURE_SIZE	16384	8192	8192	16384	16384	2048	2048	2048	2048	2048	2048	2048	2048
MAX_CUBE_MAP_TEXTURE_SIZE	16384	8192	8192	16384	16384	8192	8192	8192	8192	16384	8192	16384	16384

MAX_ARRAY_TEXTURE_LAYERS_EXT	16384	512	512	2048	2048	512	512	512	512	2048	512	2048	2048
MAX_TEXTURE_LOD_BIAS	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	16.0	16.0	16.0
MAX_TEXTURE_MAX_ANISOTROPY_EXT	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_TEXTURE_UNITS	8	8	8	8	8	8	8	8	8	8	8	8	8
NUM_COMPRESSED_TEXTURE_FORMATS	4 DXT1 DXT3 DXT5 3Dc	4 DXT1 DXT3 DXT5 3Dc	DXT1 DXT3 DXT5 3Dc	DXT1 DXT3 DXT5 3Dc	DXT1 DXT3 DXT5 3Dc	3 DXT1 DXT3 DXT5							
MAX_ATTRIB_STACK_DEPTH	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_CLIENT_ATTRIB_STACK_DEPTH	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_COLOR_MATRIX_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_MODELVIEW_STACK_DEPTH	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_NAME_STACK_DEPTH	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_PROGRAM_MATRIX_STACK_DEPTH_ARB	2	2	2	2	2	2	2	2	2	2	2	2	2
MAX_PROJECTION_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_TEXTURE_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_PROGRAM_ADDRESS_REGISTERS_ARB	2	2	2	2	2	2	2	2	2	2	2	2	2
MAX_PROGRAM_ATTRIBS_ARB	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_PROGRAM_ENV_PARAMETERS_ARB	256	256	256	256	256	256	256	256	256	256	256	256	256
MAX_PROGRAM_INSTRUCTIONS_ARB	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K
MAX_PROGRAM_LOCAL_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_MATRICES_ARB	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_PROGRAM_NATIVE_ADDRESS_REGISTERS_ARB	1	1	1	1	1	2	2	2	2	2	1	1	1
MAX_PROGRAM_NATIVE_ATTRIBS_ARB	32	16	16	16	16	16	16	16	16	16	18	18	18
MAX_PROGRAM_NATIVE_INSTRUCTIONS_ARB	256K	4096	4096	4096	4096	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_NATIVE_PARAMETERS_ARB	1024	256	256	256	256	1024	1024	1024	1024	1024	512	512	512
MAX_PROGRAM_NATIVE_TEMPORARIES_ARB	65535	64	64	64	64	4096	4096	4096	4096	4096	100	1024	1024
MAX_PROGRAM_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_TEMPORARIES_ARB	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535
MAX_PROGRAM_CALL_DEPTH_NV	0	4	4	4	4	32	32	32	32	32	4	4	4
MAX_PROGRAM_EXEC_INSTRUCTIONS_NV	0	4096	4096	4096	4096	16M	16M	16M	16M	16M	65536	65536	65536
MAX PROGRAM ALU INSTRUCTIONS ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX PROGRAM ATTRIBS ARB	32	10	10	10	10	16	16	16	16	16	18	18	18
MAX_PROGRAM_ENV_PARAMETERS_ARB	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_PROGRAM_INSTRUCTIONS_ARB	256K	4096	4096	4096	4096	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_LOCAL_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_NATIVE_ALU_INSTRUCTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_NATIVE_ATTRIBS_ARB	32	10	10	10	10	16	16	16	16	16	18	18	18
MAX_PROGRAM_NATIVE_INSTRUCTIONS_ARB	256K	4096	4096	4096	4096	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_NATIVE_PARAMETERS_ARB	1024	256	256	256	256	1024	1024	1024	1024	1024	512	512	512
MAX PROGRAM NATIVE TEMPORARIES ARB	65535	64	64	64	64	4096	4096	4096	4096	4096	1024	1024	1024
MAX_PROGRAM_NATIVE_TEX_INDIRECTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_NATIVE_TEX_INSTRUCTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_PARAMETERS_ARB	1024	256	256	256	256	1024	1024	1024	1024	1024	512	512	512
17/7 (A.Z.) 1.10 O 1.0 (10) _1 / 11 / 11 / 11 / 11 / 11 / 11 / 11	1024	200	200	200	200	1024	1024	1027	1024	1024	512		012
MAX PROGRAM TEMPORARIES ARB	65535	64	64	64	64	4096	4096	4096	4096	4096	1024	1024	1024

MAX_PROGRAM_TEX_INSTRUCTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_CALL_DEPTH_NV	0	4	4	4	4	32	32	32	32	32	4	4	4
MAX_PROGRAM_EXEC_INSTRUCTIONS_NV	0	4096	4096	4096	4096	16M	16M	16M	16M	16M	65536	65536	65536
MAX_PROGRAM_IF_DEPTH_NV	0	32	32	32	32	64	64	64	64	64	48	48	48
MAX_PROGRAM_LOOP_COUNT_NV	0	255	255	255	255	16M	16M	16M	16M	16M	255	255	255
MAX_PROGRAM_LOOP_DEPTH_NV	0	32	32	32	32	64	64	64	64	64	32	32	32
MAX_COMBINED_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_FRAGMENT_UNIFORM_COMPONENTS	4096	4096	4096	4096	4096	2048	2048	2048	2048	2048	4096	4096	4096
MAX_TEXTURE_COORDS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VARYING_FLOATS	128	128	128	128	128	60	60	60	60	124	60	60	60
MAX_VERTEX_ATTRIBS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_UNIFORM_COMPONENTS	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
MAX_GEOMETRY_OUTPUT_VERTICES_EXT	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_GEOMETRY_TEXTURE_IMAGE_UNITS_EXT	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_GEOMETRY_TOTAL_OUTPUT_COMPONENTS_EXT	16384	16384	16384	16384	16384	1024	1024	1024	1024	1024	16384	16384	16384
MAX_GEOMETRY_UNIFORM_COMPONENTS_EXT	4096	4096	4096	1024	1024	2048	2048	2048	2048	2048	4096	4096	4096
MAX GEOMETRY VARYING COMPONENTS EXT	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_VARYING_COMPONENTS_EXT	128	128	128	128	128	60	60	60	60	124	60	60	60
MAX VERTEX VARYING COMPONENTS EXT	128	128	128	128	128	64	64	64	64	128	64	64	64
MIN_PROGRAM_TEXEL_OFFSET_EXT	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8
MAX_PROGRAM_TEXEL_OFFSET_EXT	7	7	7	7	7	7	7	7	7	7	7	7	7
MAX_XFB_INTERLEAVED_COMPONENTS_EXT	64	512	512	512	512	64	64	64	64	64	64	64	64
MAX XFB SEPARATE ATTRIBS EXT	4	4	4	4	4	4	4	4	4	4	4	4	4
MAX_XFB_SEPARATE_COMPONENTS_EXT	32	4	4	4	4	4	4	4	4	4	32	32	32
PRIMITIVES_GENERATED_EXT (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32
XFB_PRIMITIVES_WRITTEN_EXT (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_BINDABLE_UNIFORM_SIZE_EXT	1M	65536	65536	65536	65536	65536	65536	65536	65536	65536	0	0	0
MAX_VERTEX_BINDABLE_UNIFORMS_EXT	256	12	12	12	12	12	12	12	12	14	0	0	0
MAX_GEOMETRY_BINDABLE_UNIFORMS_EXT	256	12	12	12	12	12	12	12	12	14	0	0	0
MAX_FRAGMENT_BINDABLE_UNIFORMS_EXT	256	12	12	12	12	12	12	12	12	14	0	0	0
MAX_CLIP_PLANES	6	6	6	6	6	6	6	6	6	6	6	6	6
MAX_CONVOLUTION_HEIGHT	11	11	11	11	11	11	11	11	11	11	11	11	11
MAX_CONVOLUTION_WIDTH	11	11	11	11	11	11	11	11	11	11	11	11	11
MAX_ELEMENTS_INDICES	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000
MAX_ELEMENTS_VERTICES	1M												
MAX_EVAL_ORDER	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_LIGHTS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_LIST_NESTING	64	64	64	64	64	64	64	64	64	64	64	64	64
MAX_PIXEL_MAP_TABLE	256	256	256	256	256	256	256	256	256	256	256	256	256
MAX_SHININESS_NV	128	128	128	128	128	1024	1024	1024	1024	1024	128	128	128
MAX_SPOT_EXPONENT_NV	128	128	128	128	128	1024	1024	1024	1024	1024	128	128	128
MAX_VERTEX_ARRAY_RANGE_ELEMENT_APPLE	1M	65535	65535	65535									
MAX_VERTEX_UNITS_ARB	4	4	4	4	4	4	4	4	4	4	4	4	4

SAMPLES_PASSED (query bits)	32	63	63	63	63	32	32	32	32	32	64	64	64
TIME_ELAPSED_EXT (query bits)	32	63	63	63	63	32	32	32	32	32	64	64	64
MAX_SERVER_WAIT_TIMEOUT	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E
Off Screen													
Full Screen		~	~	~	~	~	~	~	~	~	~	~	~
Hardware Accelerated		~	✓	~	~	~	✓	~	~	~	~	~	~
Robust	~												
Backing Store	~	~	✓	~	~	~	✓	✓	~	~	✓	~	✓
MP Safe	~	~	✓	~	~	~	✓	✓	~	~	✓	~	~
Window	~	~	~	~	~	~	✓	✓	~	✓	✓	~	~
Multi Screen	~												
Compliant	~	~	~	~	~	~	✓	✓	~	~	~	~	~
Monoscopic	~	~	✓	~	~	~	✓	~	✓	~	✓	~	✓
Stereoscopic		~	✓	~	✓	~	✓	✓	~				
Single Buffer	~	~	~	~	~	~	~	✓	~	~	✓	~	~
Double Buffer	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
Color Buffer Modes (bpp RGB-A)	24-8	15-1	15-1	15-1	15-1	15	15	15	15	15	24-8	24-8	24-8
	96-32f	24-8 30-2 48-16 48-16h 96-32f	24-8 30-2 48-16 48-16h 96-32f	24-8 30-2 48-16 48-16h 96-32f	24-8 30-2 48-16 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f
Accum Buffer Modes (bpp RGB-A)	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f
Depth Buffer Modes (bpp)	0	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24
Stencil Buffer Modes (bpp)	0	0	0	0	0	0 8	0	0	0	0	0	0	0
Max Aux Buffers	4	2	2	2	2	2	2	2	2	2	2	2	2
Max Sample Buffers	1	1	1	1	1	1	1	1	1	1	1	1	1
Max Samples	16	4	8	4	8	8	8	8	8	8	4	8	8
Supersampling	✓	~	~	~	✓								
Multisampling		~	✓	~	~	~	✓	~	~	~	✓	~	✓
Alphasampling	✓	✓	✓	~	✓	✓	✓	~	~	~	✓	~	✓
GPU Vertex Processing		~	~	~	~	~	✓	~	~	~	✓	✓	✓
GPU Fragment Processing		✓	~	~	✓	✓	✓	~	~	~	✓	~	✓
Video Memory (megabytes)	0	128	256 512	256	2565121024	128 256 512	1536	256 512 1024	1536	512 1024 2048	256 384 512	384 512 768 1024	1024

- This data describes functionality only. Actual rendering results may differ across renderers with identical reported capabilities; always verify your results on the real hardware.
- always verify your results on the real hardware.

 Renderers based on the same chipset (variants such as Pro/Mobility) are condensed into single columns here. The exported capabilities are identical, the performance differs.
- SGI_color_matrix functionality is implied by ARB_imaging, but not exported on renderers marked by "~"

OpenGL Capabilities Tables
This table lists Legacy OpenGL extensions and parameter values reported for macOS 10.9. Click the name of a reported extension to view its specification.

HD Graphics 5000/Iris													
HD Graphics 4000													
HD Graphics 4000													
GeForce 640/650/660/675/680/750/755/775/780													
Quadro FX 4800													
GeForce 9400/285/320/330													
Quadro FX 5600													
GeForce 8600/8800/9600/120/130													
Radeon HD 5670/5750/5770/5870/6630/6750/6770/6970													
Radeon HD 6490													
Radeon HD 2600/4670/4850/4870													
Radeon HD 2400													
Software Renderer													
OpenGL Version	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
GLSL Version	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
ARB color buffer float	v	1.20 ✓	· · · · · · · · · · · · · · · · · · ·	1.20 ✓	√	1.20 ✓	1.20 ✓	1.20 ✓	·/	1.20 ✓	v	1.20 ✓	√
ARB depth buffer float	~	· ·	~	~		~	✓ ✓	·	~	· ·	~	· ·	✓ ✓
	~	~	~	· /	✓ ✓	~	~ ~	· ·	~	· /	~	~	~
ARB depth clamp	~	· ·		· ·		~	~ ~				~		
ARB depth texture			~		~			/	~	~		~	~
ARB_draw_buffers	✓ ✓	~	~	~	~	<i>✓</i>	✓ ·	~	~	~	~	~	~
ARB_draw_elements_base_vertex		~	~	~	✓	~	✓	~	~	~	✓ ·	~	✓
ARB_draw_instanced	✓	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_fragment_program	✓	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB_fragment_program_shadow	✓	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB_fragment_shader	~	~	✓	~	~	~	✓	~	~	~	~	~	✓
ARB_framebuffer_object	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB framebuffer sRGB	~	~	✓	~	~	~	~	~	~	~	~	~	✓
ARB half float pixel	~	~	~	~	~	~	✓	~	~	~	✓	~	~
ARB half float vertex	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB_imaging	~	~	~	~	~	~	✓	~	~	~			
ARB_instanced_arrays	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB_multisample	~	~	~	~	~	~	✓	~	~	~	✓	~	~
ARB_multitexture	✓	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_occlusion_query	~	~	~	~	~	~	✓	~	~	~	✓	~	~
ARB_pixel_buffer_object	✓	~	✓	~	✓	~	✓	~	~	~	✓	~	✓
ARB_point_parameters	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB point sprite	~	~	~	~	~	~	✓	~	~	~	~	~	~
ARB_provoking_vertex	~	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_seamless_cube_map	~	~	✓	~	~			~	✓	~	✓	~	✓
ARB_shader_objects	~	~	✓	~	✓	~	✓	~	✓	~	✓	~	✓
ARB_shader_texture_lod	~	~	~	~	~	~	✓	~	~	~	~	~	✓
ARB_shading_language_100	~	~	~	~	~	~	~	~	~	~	~	~	✓

ARB_shadow	~	✓											
ARB_shadow_ambient	~	✓	✓	~	✓								
ARB_sync	~	✓	✓	~	✓	✓	✓	~	✓	✓	✓	✓	✓
ARB_texture_border_clamp	~	✓	✓	~	✓	~	✓	~	~	✓	✓	✓	✓
ARB_texture_compression	~	✓	~	~	✓	~	✓	~	~	✓	✓	✓	✓
ARB_texture_compression_rgtc	~	~	~	~	~	~	✓	~	✓	~	✓	~	✓
ARB_texture_cube_map	~	✓	~	~	~	~	✓	~	✓	~	✓	✓	✓
ARB_texture_env_add	~	~	~	~	✓	~	✓	~	~	~	✓	~	✓
ARB texture env combine	~	✓	~	~	✓	~	✓	~	~	~	✓	~	✓
ARB texture env crossbar	~	~	~	~	~	~	✓	~	✓	~	✓	~	✓
ARB texture env dot3	~	~	~	~	✓	~	✓	~	~	~	✓	~	✓
ARB_texture_float	~	~	~	~	~	~	✓	~	✓	~	✓	~	✓
ARB_texture_mirrored_repeat	~	✓	~	~	✓	~	✓	~	~	~	✓	~	✓
ARB_texture_non_power_of_two	~	✓	~	~	✓	~	✓	~	✓	~	✓	✓	✓
ARB_texture_rectangle	~	~	~	~	✓	~	✓	~	~	~	✓	~	✓
ARB_texture_rg	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_transpose_matrix	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB_vertex_array_bgra	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB vertex blend	~	✓	✓	~	✓	~	✓	~	~	~	✓	~	✓
ARB vertex buffer object	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB vertex program	~	~	~	~	✓	~	✓	~	~	~	✓	~	✓
ARB_vertex_shader	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
ARB_window_pos	~	✓	~	~	✓	~	✓	~	~	~	✓	✓	✓
EXT abgr	~	~	~	~	~	~	✓	~	✓	~	✓	~	✓
EXT_bgra	~	~	~	~	~	~	✓	~	✓	~	✓	~	✓
EXT bindable uniform	~	~	~	~	~	~	✓	~	~	~			
EXT_blend_color	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
EXT_blend_equation_separate	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
EXT_blend_func_separate	~	~	~	~	~	~	✓	~	✓	~	✓	~	✓
EXT_blend_minmax	~	✓	~	~	✓	~	✓	~	~	~	✓	✓	✓
EXT_blend_subtract	~	✓	~	~	~	~	✓	~	✓	~	✓	~	✓
EXT_clip_volume_hint	~	✓	~	~	~	~	~	~	~	~	✓	~	✓
EXT_debug_label	~	~	~	~	~	~	✓	~	✓	~	✓	~	✓
EXT debug marker	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
EXT depth bounds test	~					~	✓	~	✓	~			
EXT draw buffers2	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
EXT_draw_range_elements	~	~	~	~	✓	~	✓	~	~	~	✓	~	✓
EXT_fog_coord	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
EXT_framebuffer_blit	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_framebuffer_multisample	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_framebuffer_multisample_blit_scaled	~					~	✓	~	~	~			
EXT_framebuffer_object	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
EXT_framebuffer_sRGB	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT geometry shader4	~	~	~	~	~	~	✓	~	~	~	✓	~	~
EXT gpu program parameters	~	~	~	~	~	~	✓	~	~	~	~	~	~
EXT gpu shader4	~	~	~	~	~	~	✓	~	~	~	~	~	~

EXT multi draw arrays	✓	✓	~	✓	~	~	✓	✓	~	~	✓	✓	✓
EXT packed depth stencil	~	~	~	~	~	~	~	✓	~	~	✓	~	✓
EXT_packed_float	~	~	~	~	~	~	~	✓	~	~	✓	~	✓
EXT_provoking_vertex	✓	✓	~	✓	✓	~	~	~	~	~	~	~	✓
EXT_rescale_normal	✓	✓	~	~	✓	~	~	~	~	~	~	~	✓
EXT_secondary_color	~	~	~	~	✓	~	~	~	~	~	~	~	~
EXT_separate_specular_color	✓	~	~	✓	~	✓	✓						
EXT_shadow_funcs	✓	✓	~	~	✓	~	~	~	~	~	~	~	✓
EXT_stencil_two_side	✓	✓	~	✓	✓	~	~	✓	~	~	✓	~	✓
EXT_stencil_wrap	✓	✓	✓	✓	✓	~	~	~	~	~	✓	~	✓
EXT_texture_array	✓	✓	✓	✓	✓	~	✓	~	~	~	✓	~	✓
EXT_texture_compression_dxt1	✓	✓	~	✓	✓	~	✓	✓	~	~	✓	✓	✓
EXT_texture_compression_s3tc	✓	✓	~	✓	✓	~	✓	~	~	~	~	~	~
EXT_texture_env_add	✓	~	✓	~	✓	~	~	~	~	~	~	✓	✓
EXT_texture_filter_anisotropic	~	✓	~	~	✓	~	~	~	~	~	~	~	~
EXT_texture_integer	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_texture_lod_bias	~	~	~	~	~	~	~	~	~	~	~	~	~
EXT_texture_mirror_clamp	~	~	~	✓	✓	~	~	~	~	~			
EXT_texture_rectangle	~	~	~	~	~	~	~	~	~	~	~	~	✓
EXT texture shared exponent	~	~	~	~	~	~	~	~	~	~	~	~	✓
EXT texture sRGB	~	~	~	~	✓	~	~	~	~	~	~	~	~
EXT_texture_sRGB_decode	~	~	~	~	✓	~	~	~	~	~	~	~	✓
EXT_timer_query	✓	✓	~	~	~								
EXT_transform_feedback	~	~	~	~	✓								
EXT_vertex_array_bgra	~	~	~	~	~	~	~	~	~	~	~	~	~
APPLE aux depth stencil	~	~	~	~	~	~	~	~	~	~	~	✓	✓
APPLE_client_storage	~	~	~	~	✓	~	~	~	~	~	~	✓	~
APPLE element array	~	~	~	~	✓	✓	✓	✓	~	~	~	✓	✓
APPLE_fence	~	~	~	✓	✓	~	~	~	~	~	~	~	✓
APPLE_float_pixels	✓	✓	~	✓	✓	~	~	✓	~	~	~	~	✓
APPLE_flush_buffer_range	✓	✓	~	✓	✓	~	✓	~	~	~	✓	~	✓
APPLE_flush_render	~	~	~	✓	✓	~	✓	~	~	~	~	~	✓
APPLE_object_purgeable		~	~	~	~	~	~	~	~	~	✓	✓	~
APPLE packed pixels	~	~	~	~	~	~	~	~	~	~	✓	~	~
APPLE_pixel_buffer	~	~	~	~	~	~	~	~	~	~	✓	✓	✓
APPLE rgb 422	~	~	~	~	~	~	~	~	~	~	✓	~	✓
APPLE_row_bytes	~	~	~	~	~	~	✓	~	~	~	✓	✓	✓
APPLE specular vector	~	~	~	~	~	~	~	~	~	~	✓	✓	✓
APPLE_texture_range	✓	~	~	✓	~	~	~	✓	~	~	✓	✓	✓
APPLE_transform_hint	~	~	~	~	~	~	~	✓	~	~	✓	~	✓
APPLE_vertex_array_object	✓	✓	✓	✓	~	✓	✓	✓	~	✓	✓	✓	✓
APPLE_vertex_array_range	~	~	~	✓	~	~	~	~	~	~	✓	✓	✓
APPLE_vertex_point_size	✓	~	~	✓	✓	✓	✓	✓	✓	~	✓	✓	✓
APPLE vertex program evaluators	~	✓	~	~	✓	~	✓	~	~	~	✓	~	✓
APPLE votor 422	·	<u> </u>	~	· ·	~	/	~	·	~	~	✓	✓	·
ATI_blend_equation_separate		· /	~	~	~								
s.s.s_oquation_oopulato													

ATI_blend_weighted_minmax		~	~	~	✓								
ATI separate stencil	~	· /	~	· /	~	~	~	~	~	~	~	~	~
ATI_texture_compression_3dc	~	· /	~	· /	~								
ATI texture env combine3	~	· /	~	·	~	~	~	~	~		~		✓
ATI_texture_float	~	· /	~	· /	~	*	~	*	~	· /	*	· /	~
ATI_texture_mirror_once	✓	· /	~	~	~	✓	~	·	~	~	~	~	~
IBM rasterpos clip	· ·	<u> </u>	· /	· ·	~	<i>'</i>	~	~	~	· ·	· /	-	·
NV_blend_square	~	· ·	·	·	~	~	~	~	~	~	~	~	~
NV_conditional_render	~	· ·	<i>'</i>	·	~	~	~	*	~	~	~	~	~
NV_depth_clamp	· /	· ·	· ·	· ·	~	· ·	·	· ·	·	· /	~	· /	· /
NV fog distance	~	/	~	~	~	~	~	~	~		~	~	~
NV fragment_program2	,	<u> </u>	•		•	✓	~	~	~	· /			`
NV fragment program option						<i>y</i>	~	*	~	· /			
NV light_max_exponent	~	~	~	~	~	✓	~	~	~	· /	~	~	✓
NV multisample filter hint	•	<u> </u>	•	<u> </u>	<u> </u>	~	~	~	~	~		•	`
NV_point_sprite						✓	·	· ·	~	· /			
NV_texgen_reflection	~	~	✓	~	~	· /	✓	~	~	-	~	~	~
NV_texture_barrier	~	~	✓	~	~	~	✓	~	~	~	~	~	~
NV_vertex_program2_option						~	~	✓	~	~			
NV vertex_program3						✓	✓	~	~	~			
SGI color matrix	~	✓	~	~	~	~	~	~	~	~			
SGIS_generate_mipmap	~	✓	~	~	~	~	~	✓	~	~	~	~	~
SGIS_texture_edge_clamp	~	~	✓	~	~	~	✓	~	~	~	~	~	~
SGIS_texture_lod	~	✓	✓	~	~	~	✓	✓	~	~	✓	~	~
MAX_COLOR_ATTACHMENTS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_DRAW_BUFFERS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_RENDERBUFFER_SIZE	16384	8192	8192	16384	16384	8192	8192	8192	8192	16384	8192	16384	16384
MAX_SAMPLES	16	4	8	4	8	8	8	8	8	8	4	8	8
MAX_VIEWPORT_DIMS	16384 16384	8192 8192	8192 8192	16384 16384	16384 16384	8192 8192	8192 8192	8192 8192	8192 8192	16384 16384	8192 8192	16384 16384	16384 16384
MIN_PBUFFER_VIEWPORT_DIMS_APPLE	1	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	32 32	2 2	2 2	2
SUBPIXEL_BITS	10	8	8	8	8	8	8	8	8	8	8	8	8
ALIASED_LINE_WIDTH_RANGE	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 10.0	1.0	1.0 10.0	1.0 10.0	1.0 10.0	1.0 7.0	1.0 7.0	1.0 7.0
ALIASED_POINT_SIZE_RANGE	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 63.0	1.0	1.0 63.0	1.0 63.0	1.0 63.0	1.0 64.0	1.0 64.0	1.0 64.0
SMOOTH_LINE_WIDTH_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
SMOOTH_LINE_WIDTH_RANGE	0.1 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	0.5 10.0	0.5 10.0	0.5 10.0	0.5 10.0	0.5 10.0	0.125 7.0	0.125 7.0	0.125 7.0
SMOOTH_POINT_SIZE_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
SMOOTH_POINT_SIZE_RANGE	0.1 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 63.375	1.0 63.375	1.0 63.375	1.0 63.375	1.0 63.375	0.125 64.0	0.125 64.0	0.125 64.0
MAX_TEXTURE_SIZE	16384	8192	8192	16384	16384	8192	8192	8192	8192	16384	8192	16384	16384
MAX_RECTANGLE_TEXTURE_SIZE_EXT	16384	8192	8192	16384	16384	8192	8192	8192	8192	16384	8192	16384	16384
MAX_3D_TEXTURE_SIZE	16384	8192	8192	16384	16384	2048	2048	2048	2048	2048	2048	2048	2048
MAX_CUBE_MAP_TEXTURE_SIZE	16384	8192	8192	16384	16384	8192	8192	8192	8192	16384	8192	16384	16384
-													

MAX_ARRAY_TEXTURE_LAYERS_EXT	16384	512	512	2048	2048	512	512	512	512	2048	512	2048	2048
MAX_TEXTURE_LOD_BIAS	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	15.0	16.0	16.0	16.0
MAX_TEXTURE_MAX_ANISOTROPY_EXT	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_TEXTURE_UNITS	8	8	8	8	8	8	8	8	8	8	8	8	8
NUM_COMPRESSED_TEXTURE_FORMATS	4 DXT1 DXT3 DXT5 3Dc	4 DXT1 DXT3 DXT5 3Dc	4 DXT1 DXT3 DXT5 3Dc	4 DXT1 DXT3 DXT5 3Dc	4 DXT1 DXT3 DXT5 3Dc	3 DXT1 DXT3 DXT5							
MAX_ATTRIB_STACK_DEPTH	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_CLIENT_ATTRIB_STACK_DEPTH	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_COLOR_MATRIX_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_MODELVIEW_STACK_DEPTH	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_NAME_STACK_DEPTH	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_PROGRAM_MATRIX_STACK_DEPTH_ARB	2	2	2	2	2	2	2	2	2	2	2	2	2
MAX_PROJECTION_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_TEXTURE_STACK_DEPTH	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_PROGRAM_ADDRESS_REGISTERS_ARB	2	2	2	2	2	2	2	2	2	2	2	2	2
MAX_PROGRAM_ATTRIBS_ARB	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_PROGRAM_ENV_PARAMETERS_ARB	256	256	256	256	256	256	256	256	256	256	256	256	256
MAX_PROGRAM_INSTRUCTIONS_ARB	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K	256K
MAX_PROGRAM_LOCAL_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_MATRICES_ARB	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_PROGRAM_NATIVE_ADDRESS_REGISTERS_ARB	1	1	1	1	1	2	2	2	2	2	1	1	1
MAX_PROGRAM_NATIVE_ATTRIBS_ARB	32	16	16	16	16	16	16	16	16	16	18	18	18
MAX_PROGRAM_NATIVE_INSTRUCTIONS_ARB	256K	4096	4096	4096	4096	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_NATIVE_PARAMETERS_ARB	1024	256	256	256	256	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_NATIVE_TEMPORARIES_ARB	65535	64	64	64	64	4096	4096	4096	4096	4096	100	1024	1024
MAX_PROGRAM_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_TEMPORARIES_ARB	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535	65535
MAX_PROGRAM_CALL_DEPTH_NV	0	4	4	4	4	32	32	32	32	32	4	4	4
MAX_PROGRAM_EXEC_INSTRUCTIONS_NV	0	4096	4096	4096	4096	16M	16M	16M	16M	16M	65536	65536	65536
MAX_PROGRAM_ALU_INSTRUCTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX PROGRAM ATTRIBS ARB	32	10	10	10	10	16	16	16	16	16	18	18	18
MAX_PROGRAM_ENV_PARAMETERS_ARB	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_PROGRAM_INSTRUCTIONS_ARB	256K	4096	4096	4096	4096	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_LOCAL_PARAMETERS_ARB	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_NATIVE_ALU_INSTRUCTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_NATIVE_ATTRIBS_ARB	32	10	10	10	10	16	16	16	16	16	18	18	18
MAX_PROGRAM_NATIVE_INSTRUCTIONS_ARB	256K	4096	4096	4096	4096	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_NATIVE_PARAMETERS_ARB	1024	256	256	256	256	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_NATIVE_TEMPORARIES_ARB	65535	64	64	64	64	4096	4096	4096	4096	4096	1024	1024	1024
MAX_PROGRAM_NATIVE_TEX_INDIRECTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_NATIVE_TEX_INSTRUCTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_PARAMETERS_ARB	1024	256	256	256	256	1024	1024	1024	1024	1024	1024	1024	1024
MAX_PROGRAM_TEMPORARIES_ARB	65535	64	64	64	64	4096	4096	4096	4096	4096	1024	1024	1024
MAX_PROGRAM_TEX_INDIRECTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
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MAX_PROGRAM_TEX_INSTRUCTIONS_ARB	256K	2048	2048	2048	2048	16384	65536	16384	65536	16384	16384	16384	16384
MAX_PROGRAM_CALL_DEPTH_NV	0	4	4	4	4	32	32	32	32	32	4	4	4
MAX_PROGRAM_EXEC_INSTRUCTIONS_NV	0	4096	4096	4096	4096	16M	16M	16M	16M	16M	65536	65536	65536
MAX_PROGRAM_IF_DEPTH_NV	0	32	32	32	32	64	64	64	64	64	48	48	48
MAX_PROGRAM_LOOP_COUNT_NV	0	255	255	255	255	16M	16M	16M	16M	16M	255	255	255
MAX_PROGRAM_LOOP_DEPTH_NV	0	32	32	32	32	64	64	64	64	64	32	32	32
MAX_COMBINED_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_FRAGMENT_UNIFORM_COMPONENTS	4096	3072	3072	3072	3072	2048	2048	2048	2048	2048	4096	4096	4096
MAX_TEXTURE_COORDS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VARYING_FLOATS	128	128	128	128	128	60	60	60	60	124	60	60	60
MAX_VERTEX_ATTRIBS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_UNIFORM_COMPONENTS	4096	3072	3072	3072	3072	4096	4096	4096	4096	4096	4096	4096	4096
MAX_GEOMETRY_OUTPUT_VERTICES_EXT	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_GEOMETRY_TEXTURE_IMAGE_UNITS_EXT	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_GEOMETRY_TOTAL_OUTPUT_COMPONENTS_EXT	16384	16384	16384	16384	16384	1024	1024	1024	1024	1024	16384	16384	16384
MAX_GEOMETRY_UNIFORM_COMPONENTS_EXT	4096	3072	3072	3072	3072	2048	2048	2048	2048	2048	4096	4096	4096
MAX_GEOMETRY_VARYING_COMPONENTS_EXT	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_VARYING_COMPONENTS_EXT	128	128	128	128	128	60	60	60	60	124	60	60	60
MAX VERTEX VARYING COMPONENTS EXT	128	128	128	128	128	64	64	64	64	128	64	128	128
MIN_PROGRAM_TEXEL_OFFSET_EXT	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8
MAX_PROGRAM_TEXEL_OFFSET_EXT	7	7	7	7	7	7	7	7	7	7	7	7	7
MAX_XFB_INTERLEAVED_COMPONENTS_EXT	64	64	64	64	64	64	64	64	64	64	64	64	64
MAX XFB SEPARATE ATTRIBS EXT	4	4	4	4	4	4	4	4	4	4	4	4	4
MAX_XFB_SEPARATE_COMPONENTS_EXT	4	4	4	4	4	4	4	4	4	4	4	4	4
PRIMITIVES_GENERATED_EXT (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32
XFB_PRIMITIVES_WRITTEN_EXT (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_BINDABLE_UNIFORM_SIZE_EXT	65536	65536	65536	65536	65536	65536	65536	65536	65536	65536	0	0	0
MAX_VERTEX_BINDABLE_UNIFORMS_EXT	16	12	12	12	12	12	12	12	12	14	0	0	0
MAX_GEOMETRY_BINDABLE_UNIFORMS_EXT	16	12	12	12	12	12	12	12	12	14	0	0	0
MAX_FRAGMENT_BINDABLE_UNIFORMS_EXT	16	12	12	12	12	12	12	12	12	14	0	0	0
MAX_CLIP_PLANES	6	6	6	6	6	6	6	6	6	6	6	6	6
MAX_CONVOLUTION_HEIGHT	11	11	11	11	11	11	11	11	11	11	11	11	11
MAX_CONVOLUTION_WIDTH	11	11	11	11	11	11	11	11	11	11	11	11	11
MAX_ELEMENTS_INDICES	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000
MAX_ELEMENTS_VERTICES	1M												
MAX_EVAL_ORDER	10	10	10	10	10	10	10	10	10	10	10	10	10
MAX_LIGHTS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_LIST_NESTING	64	64	64	64	64	64	64	64	64	64	64	64	64
MAX_PIXEL_MAP_TABLE	256	256	256	256	256	256	256	256	256	256	256	256	256
MAX_SHININESS_NV	128	128	128	128	128	1024	1024	1024	1024	1024	128	128	128
MAX_SPOT_EXPONENT_NV	128	128	128	128	128	1024	1024	1024	1024	1024	128	128	128
MAX_VERTEX_ARRAY_RANGE_ELEMENT_APPLE	1M	65535	65535	65535									
MAX_VERTEX_UNITS_ARB	4	4	4	4	4	4	4	4	4	4	4	4	4
QUADS_FOLLOW_PROVOKING_VERTEX_CONVENTION	1	1	1	1	1	1	1	1	1	1	0	0	0

SAMPLES_PASSED (query bits)	32	63	63	63	63	32	32	32	32	32	64	64	64
TIME_ELAPSED_EXT (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32
MAX_SERVER_WAIT_TIMEOUT	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E
Off Screen													
Full Screen		~	~	~	~	~	~	~	~	~	~	~	✓
Hardware Accelerated		~	✓	~	~	~	✓	~	~	~	✓	~	✓
Robust	~												
Backing Store	~	~	✓	~	~	~	✓	✓	~	~	✓	✓	✓
MP Safe	~	~	✓	~	~	~	✓	~	~	~	✓	✓	✓
Window	~	~	~	~	~	~	✓	~	~	~	✓	~	✓
Multi Screen	~												
Compliant	~	~	✓	~	~	~	✓	~	~	~	✓	~	✓
Monoscopic	~	~	~	~	~	~	~	~	~	~	✓	~	✓
Stereoscopic		~	✓	~	~	~	✓	~	~				
Single Buffer	~	~	~	~	~	~	~	~	~	~	✓	✓	✓
Double Buffer	~	~	✓	~	~	~	~	~	~	~	~	~	✓
Color Buffer Modes (bpp RGB-A)	24-8	15-1 24-8	15-1 24-8	15-1 24-8	15-1 24-8	15	15	15	15	15	24-8	24-8	24-8
	96-32f	30-2 48-16 48-16h 96-32f	30-2 48-16 48-16h 96-32f	30-2 48-16 48-16h 96-32f	30-2 48-16 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f
Accum Buffer Modes (bpp RGB-A)	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f	96-32f
Depth Buffer Modes (bpp)	0	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24
Stencil Buffer Modes (bpp)	0	0	0	0	0	0 8	0	0	0	0	0	0	0
Max Aux Buffers	4	2	2	2	2	2	2	2	2	2	2	2	2
Max Sample Buffers	1	1	1	1	1	1	1	1	1	1	1	1	1
Max Samples	16	4	8	4	8	8	8	8	8	8	4	8	8
Supersampling	~	~	~	~	~								
Multisampling		~	~	~	~	~	~	✓	~	~	✓	~	~
Alphasampling	~	✓	✓	~	~	~	✓	✓	~	~	✓	✓	✓
GPU Vertex Processing		~	~	~	~	~	✓	~	~	~	~	~	~
GPU Fragment Processing		✓	✓	~	~	~	✓	✓	~	✓	✓	✓	✓
Video Memory (megabytes)	0	128	256 512	256	2565121024	128 256 512	1536	256 512 1024	1536	512 1024 2048 4096	256 384 512	384 512 768 1024	1024

- This data describes functionality only. Actual rendering results may differ across renderers with identical reported capabilities; always verify your results on the real hardware.
 Renderers based on the same chipset (variants such as Pro/
- Renderers based on the same chipset (variants such as Pro/ Mobility) are condensed into single columns here. The exported capabilities are identical, the performance differs.
- SGL color_matrix functionality is implied by ARB_imaging, but not exported on renderers marked by "~"

OpenGL Capabilities TablesThis table lists Core OpenGL extensions and parameter values reported for macOS 10.7.5. Click the name of a reported extension to view its specification.

HD Graphics 4000												
HD Graphics 3000												
GeForce 650												
GeForce 320/330												
GeForce 9400/285/Quadro FX 4800												
GeForce 8600/8800/9600/120/130/Quadro FX 5600												
Radeon HD 5670/5750/5770/6630/6750/6770/6970												
Radeon HD 6490												
Radeon HD 5870												
Radeon HD 2600/4670/4850/4870												
Radeon HD 2400												
Software Renderer												
OpenGL Version	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
GLSL Version	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
ARB_blend_func_extended												
ARB_draw_buffers_blend												
ARB_draw_indirect												
ARB_ES2_compatibility												
ARB explicit attrib location												
ARB_gpu_shader5												
ARB_gpu_shader_fp64												
ARB_instanced_arrays	~	~	~	~	~	~	~	~	~	~	~	~
ARB internalformat query												
ARB_occlusion_query2	~	~	~	~	~	~	~	~	~	~	~	~
ARB_sample_shading												
ARB_sampler_objects												
ARB_separate_shader_objects												
ARB shader bit encoding	~	~	~	~	~	~	~	~	~	~	~	~
ARB shader subroutine												
ARB_shading_language_include												
ARB_tessellation_shader												
ARB_texture_buffer_object_rgb32												
ARB_texture_cube_map_array												
ARB texture gather												
ARB_texture_query_lod												
ARB_texture_rgb10_a2ui												
ARB_texture_storage												
ARB texture swizzle												
ARB timer query	~	~	~	~	~	~	~	~	~	~	~	~
ARB_transform_feedback2												

ARB transform feedback3												
ARB vertex attrib 64bit												
ARB vertex type 2 10 10 10 rev												
ARB_viewport_array												
EXT debug label												
EXT_debug_marker EXT_depth_bounds_test	~						~	~	~	~		
EXT framebuffer multisample blit scaled	✓						~	~	~	~		
EXT_texture_compression_s3tc	✓	✓	~	~	~	✓	~	~	~	~	~	✓
	✓	~	~	~	~	~						✓
EXT_texture_filter_anisotropic EXT_texture_mirror_clamp	✓ ✓	✓ ✓	✓ ✓	~	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓	~	~
<u> </u>	✓	~	~	~		~		~	~	✓	,	✓
EXT_texture_sRGB_decode					~		~				~	
APPLE client storage	~	✓	~	~	✓	~	✓	~	✓	✓	~	✓
APPLE_container_object_shareable	~	~	~	~	~	~	~	~	~	~	~	✓
APPLE_flush_render												
APPLE_object_purgeable		~	~	~	~	~	~	~	✓	~	~	✓
APPLE_rgb_422	✓	✓	✓	✓	~	✓	~	~	~	~	✓	✓
APPLE row bytes	~	✓	✓	✓	~	✓	~	✓	✓	~	✓	✓
APPLE_texture_range	✓	✓	✓	✓	✓	~	✓	✓	✓	✓	~	✓
ATI_texture_mirror_once												
NV_texture_barrier												
MAX_RENDERBUFFER_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384
MAX_VIEWPORTS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_VIEWPORT_DIMS	16384.0 16384.0	8192.0 8192.0	8192.0 8192.0	16384.0 16384.0	16384.0 16384.0	16384.0 16384.0	8192.0 8192.0	8192.0 8192.0	8192.0 8192.0	16384.0 16384.0	8192.0 8192.0	16384.0 16384.0
VIEWPORT_BOUNDS_RANGE	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
LAYER_PROVOKING_VERTEX	-	-	-	-	-	-	-	-	-	-	-	-
VIEWPORT_INDEX_PROVOKING_VERTEX	-	-	-	-	-	-	-	-	-	-	-	-
VIEWPORT_SUBPIXEL_BITS	-	-	-	-	-	-	-	-	-	-	-	-
SUBPIXEL_BITS	10	8	8	8	8	8	8	8	8	8	8	8
MAX_CLIP_DISTANCES	8	8	8	8	8	8	8	8	8	8	8	8
MAX_ELEMENTS_INDICES	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000
MAX_ELEMENTS_VERTICES	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M
POINT_SIZE_RANGE	0.1 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 64.0	1.0 63.375	1.0 63.375	1.0 63.375	1.0 63.375	0.125 64.0	0.125 64.0
POINT_SIZE_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
ALIASED_LINE_WIDTH_RANGE	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SMOOTH_LINE_WIDTH_RANGE	0.1	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.125	0.125
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SMOOTH_LINE_WIDTH_GRANULARITY		1.0 0.125	1.0 0.125	1.0 0.125	1.0 0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
SMOOTH_LINE_WIDTH_GRANULARITY MAX_COLOR_ATTACHMENTS	1.0											
	1.0 0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125

MAX_SAMPLE_MASK_WORDS 10	MAX_DUAL_SOURCE_DRAW_BUFFERS	-	-	-	-	_	-	_	-	-	-	-	-
MAX_SMPLES 1		1	1	1	1	1	1	1	1	1	1	1	1
MAX_NOMES	MAX SAMPLES	16	4	8	8	4	8	8	8	8	8	4	8
MAX_DEPTH_TEXTURE_SIZE 16384 19192 19192 19194 19194 19192 19194 19194 19192 19194 1	MAX_INTEGER_SAMPLES		1			1		1				1	
MAX_DEPTH_TEXTURE_SAMPLES 168	MAX_COLOR_TEXTURE_SAMPLES	16	4	8	8	4	8	8	8	8	8	4	8
MAX_BCTANGLE_TEXTURE_SIZE	MAX_DEPTH_TEXTURE_SAMPLES		1	1	1	1	1	8	8	8	8	4	8
MAX_BCTANGLE_TEXTURE_SIZE	MAX_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384
MAX_DIEXTURE_SIZE 16384 8192 8192 16384 1646 166166666 166166666 166166666 1661666666	MAX_RECTANGLE_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384
MAX_RARY_TEXTURE_LAYERS	MAX_3D_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	2048	2048	2048	2048	2048	2048
MAX_RARY_TEXTURE_LAYERS	MAX_CUBE_MAP_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384
MAX_TEXTURE_LOD_BIAS 16.0 16	MAX_ARRAY_TEXTURE_LAYERS		512	512	512	512	512	512	512	512	2048	512	512
MAX_TEXTURE_MAX_ANISOTROPY_EXT 6	MAX_TEXTURE_BUFFER_SIZE	2G	128M	64M	64M								
NUMLCOMPRESSED_TEXTURE_FORMATS 3	MAX_TEXTURE_LOD_BIAS	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	16.0	16.0
DXT1 DXT1 DXT1 DXT1 DXT1 DXT1 DXT1 DXT1	MAX_TEXTURE_MAX_ANISOTROPY_EXT	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_UNIFORM_BLOCKS 64 14 14 14 14 14 12 12 12 12 13 13 13 MAX_VERTEX_UNIFORM_BLOCKS 64 14 14 14 14 14 14 12 12 12 12 12 13 13 13 MAX_VERTEX_UNIFORM_COMPONENTS 4096 4096 4096 4096 4096 4096 4096 4096	NUM_COMPRESSED_TEXTURE_FORMATS	DXT1 DXT3											
MAX_VERTEX_UNIFORM_COMPONENTS	MAX_VERTEX_ATTRIBS	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_UNIFORM_COMPONENTS	MAX_VERTEX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_UNIFORM_VECTORS	MAX_VERTEX_UNIFORM_BLOCKS	64	14	14	14	14	14	12	12	12	12	13	13
MAX_VERTEX_OUTPUT_COMPONENTS	MAX_VERTEX_UNIFORM_COMPONENTS	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
MAX_PATCH_VERTICES	MAX_VERTEX_UNIFORM_VECTORS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_INPUT_COMPONENTS	MAX_VERTEX_OUTPUT_COMPONENTS	128	128	128	128	128	128	64	64	64	128	64	64
MAX_TESS_CONTROL_TEXTURE_IMAGE_UNITS	MAX_PATCH_VERTICES	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_UNIFORM_BLOCKS	MAX_TESS_CONTROL_INPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_UNIFORM_COMPONENTS	MAX_TESS_CONTROL_TEXTURE_IMAGE_UNITS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_OUTPUT_COMPONENTS	MAX_TESS_CONTROL_UNIFORM_BLOCKS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_PATCH_COMPONENTS - <td>MAX_TESS_CONTROL_UNIFORM_COMPONENTS</td> <td>-</td>	MAX_TESS_CONTROL_UNIFORM_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_TOTAL_OUTPUT_COMPONENTS -	MAX_TESS_CONTROL_OUTPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_INPUT_COMPONENTS	MAX_TESS_PATCH_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_INPUT_COMPONENTS -	MAX_TESS_CONTROL_TOTAL_OUTPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_TEXTURE_IMAGE_UNITS - <td>MAX_TESS_GEN_LEVEL</td> <td>-</td>	MAX_TESS_GEN_LEVEL	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_UNIFORM_BLOCKS -	MAX_TESS_EVALUATION_INPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_UNIFORM_COMPONENTS	MAX_TESS_EVALUATION_TEXTURE_IMAGE_UNITS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_OUTPUT_COMPONENTS	MAX_TESS_EVALUATION_UNIFORM_BLOCKS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_GEOMETRY_INPUT_COMPONENTS 128 128 128 128 128 64 64 64 64 128 64 64 64 64 64 64 64 64 64 64 64 64 64	MAX_TESS_EVALUATION_UNIFORM_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-
MAX_GEOMETRY_TEXTURE_IMAGE_UNITS 16 16 16 16 16 16 16 16 16 16 16 16 16	MAX_TESS_EVALUATION_OUTPUT_COMPONENTS	_	-	-	-	-	-	-	-	-	-	-	-
MAX_GEOMETRY_UNIFORM_BLOCKS 64 64 64 14 14 14 12 12 12 12 12 13 13 13 MAX_GEOMETRY_UNIFORM_COMPONENTS 4096 4096 4096 1024 1024 1024 2048 2048 2048 2048 4096 4096 4096 MAX_GEOMETRY_OUTPUT_COMPONENTS 128 128 128 128 128 128 128 128 128 128	MAX_GEOMETRY_INPUT_COMPONENTS	128	128	128	128	128	128	64	64	64	128	64	64
MAX_GEOMETRY_UNIFORM_COMPONENTS 4096 4096 4096 1024 1024 1024 2048 2048 2048 2048 4096 4096 4096 4096 4096 4096 4096 4096	MAX_GEOMETRY_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16
MAX_GEOMETRY_OUTPUT_COMPONENTS 128 128 128 128 128 128 128 128 128 128	MAX_GEOMETRY_UNIFORM_BLOCKS	64	64	64	14	14	14	12	12	12	12	13	13
	MAX_GEOMETRY_UNIFORM_COMPONENTS	4096	4096	4096	1024	1024	1024	2048	2048	2048	2048	4096	4096
MAX_GEOMETRY_TOTAL_OUTPUT_COMPONENTS 4096 4096 4096 16384 16384 16384 1024 1024 1024 1024 4096 4096	MAX_GEOMETRY_OUTPUT_COMPONENTS	128	128	128	128	128	128	128	128	128	128	128	128
	MANY OF CHIEFFY TOTAL CLITPLIT COMPONIENTS	4006	4006	4006	1629/	1629/	1629/	1024	1024	1024	1024	1006	1006

1024	1024	1024
		1024
		128
		16
		13
		4096
		4096
		_
		_
		-
		-8
	•	7
		-
-	-	-
-	-	-
48	48	48
196K	212K	212K
-	-	-
-	-	-
194K	212K	212K
196K	212K	212K
60	39	39
6 65536	65536	65536
60	39	39
256	256	256
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
64	64	64
4	16	16
16	32	32
-	-	_
-	-	_
32	32	32
32		
32	32	32
32		32 64
	32	
32 32	32 64	64
32 32 32	32 64 64	64 64
	48 196K 194K 196K 60 65536 60 256 64 4 16 -	128

Backing Store	~	✓	~	~	~	~	~	✓	~	~	✓	✓
Compliant	~	~	~	~	~	~	~	~	~	~	~	✓
Monoscopic	✓	~	~	~	~	✓	~	~	~	~	~	✓
Stereoscopic		~	~	~	~	~	~	~	~			
Single Buffer	✓	~	~	~	~	✓	✓	~	~	~	✓	✓
Double Buffer	✓	✓	~	✓	~	✓	✓	✓	~	✓	✓	✓
Color Buffer Modes (bpp RGB-A)	24-8 96-32f	15-1 24-8 30-2 48-16 48-16h 96-32f	15-1 24-8 30-2 48-16 48-16h 96-32f	15-1 24-8 30-2 48-16 48-16h 96-32f	15-1 24-8 30-2 48-16 48-16h 96-32f	15-1 24-8 30-2 48-16 48-16h 96-32f	15 24-8 48-16h 96-32f	15 24-8 48-16h 96-32f	15 24-8 48-16h 96-32f	15 24-8 48-16h 96-32f	24-8 48-16h 96-32f	24-8 48-16h 96-32f
Depth Buffer Modes (bpp)	32	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24
Stencil Buffer Modes (bpp)	0	0	0	0	0	0	0	0	0	0	0	0
Max Sample Buffers	1	1	1	1	1	1	1	1	1	1	1	1
Max Samples	16	4	8	8	4	8	8	8	8	8	4	8
Supersampling	~	~	~	~	~	~						
Multisampling		~	~	✓	~	✓	~	~	~	~	~	✓
Alphasampling	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GPU Vertex Processing		✓	~	~	~	~	~	~	~	~	✓	✓
GPU Fragment Processing		✓	~	~	✓	✓	✓	~	~	~	✓	✓
Video Memory (megabytes)	0	128	256 512	1024	256	25651210242048	128 256 512	25610241536	256 512	512 1024 2048 4096	256 384 512	384 512 768 1024

- This data describes functionality only. Actual rendering results may differ across renderers with identical reported capabilities; always verify your results on the real hardware.
 Renderers based on the same chipset (variants such as Pro/
- Renderers based on the same chipset (variants such as Pro/ Mobility) are condensed into single columns here. The exported capabilities are identical, the performance differs.

OpenGL Capabilities TablesThis table lists Core OpenGL extensions and parameter values reported for macOS 10.8.5. Click the name of a reported extension to view its specification.

HD Graphics 5000/Iris													
HD Graphics 4000													
HD Graphics 3000													
GeForce 640/650/660/675/680/750/755/775/780													
GeForce 320/330													
GeForce 9400/285/Quadro FX 4800													
GeForce 8600/8800/9600/120/130/Quadro FX 5600													
Radeon HD 5670/5750/5770/6630/6750/6770/6970													
Radeon HD 6490													
Radeon HD 5870													
Radeon HD 2600/4670/4850/4870													
Radeon HD 2400													
Software Renderer													
OpenGL Version	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
GLSL Version	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
ARB blend func extended	1.00	1.50	1.50	1.50	1.50	1.00	1.50	1.00	1.50	1.00	1.00	1.50	1.00
ARB draw buffers blend													
ARB draw indirect													
ARB ES2 compatibility													
ARB_explicit_attrib_location	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_gpu_shader5	•		<u> </u>	•	<u> </u>	•	•	•	·	•	•	•	•
ARB_gpu_shader_fp64													
ARB_instanced_arrays	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_internalformat_query	•	<u> </u>	· ·	*	· ·	•	•	•	•	•	•	<u> </u>	•
ARB_occlusion_query2	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_sample_shading	•	<u> </u>	<u> </u>	*	<u> </u>	•	•	•	•	•	•	<u> </u>	•
ARB sampler objects													
ARB separate shader objects	✓	~	~	~	~	~	~	~	~	~		~	~
ARB shader bit encoding	✓	· ·	~	~	<i>~</i>	~ ~	· ·	~	· /	~ ~	~	~ ~	~
ARB_shader_subroutine	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_shading_language_include													
ARB tessellation shader													
ARB texture buffer object rgb32													
ARB_texture_cube_map_array													
ARB texture gather													
ARB texture query lod													
ARB texture rgb10 a2ui													
ARB texture storage													
ARB texture swizzle	✓	~	~	✓	~	~	~	~	~	~		~	~
ARB_timer_query	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_transform_feedback2													
ARB_transform_feedback3													

1.22													
ARB_vertex_attrib_64bit													
ARB vertex type 2 10 10 10 rev													
ARB_viewport_array													
EXT_debug_label													
EXT_debug_marker													
EXT_depth_bounds_test	~						✓	✓	~	✓			
EXT_framebuffer_multisample_blit_scaled	~						✓	✓	~	✓			
EXT texture compression s3tc	~	~	~	✓	~	~	~	✓	~	✓	~	✓	~
EXT_texture_filter_anisotropic	~	~	~	✓	~	~	~	✓	~	✓	~	✓	~
EXT_texture_mirror_clamp	~	~	~	✓	~	~	~	~	~	✓			
EXT_texture_sRGB_decode	~	~	~	✓	~	~	~	✓	~	~	~	✓	~
APPLE client storage	~	~	~	✓	~	~	~	~	~	✓	~	~	~
APPLE_container_object_shareable	~	✓	~	✓	~	~	✓	✓	~	✓	~	✓	~
APPLE_flush_render													
APPLE_object_purgeable		~	~	✓	~	~	✓	~	~	~	✓	✓	~
APPLE_rgb_422	~	~	~	✓	✓	✓	✓	✓	~	~	~	✓	~
APPLE_row_bytes	~	~	~	✓	✓	✓	✓	✓	~	~	~	✓	~
APPLE_texture_range	~	~	~	✓	✓	✓	✓	✓	~	~	~	✓	~
ATI texture mirror once	~	~	~	✓	~	~	~	✓	~	~	~	✓	~
NV_texture_barrier													
MAX_RENDERBUFFER_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384	16384
MAX_VIEWPORTS	-	-	-	_	-	-	-	_	-	-	-	-	-
MAX_VIEWPORT_DIMS	16384.0 16384.0	8192.0 8192.0	8192.0 8192.0	16384.0 16384.0	16384.0 16384.0	16384.0 16384.0	8192.0 8192.0	8192.0 8192.0	8192.0 8192.0	16384.0 16384.0	8192.0 8192.0	16384.0 16384.0	16384.0 16384.0
VIEWPORT_BOUNDS_RANGE	-	-	-	-	-	-	-	-	-	-	-	-	-
LAYER_PROVOKING_VERTEX	-	-	-	-	-	-	-	-	-	-	-	-	-
VIEWPORT_INDEX_PROVOKING_VERTEX	-	-	-	_	-	_	-	_	-	_	-	_	-
VIEWPORT_SUBPIXEL_BITS	-	-	-	-	-	_	-	-	-	_	-	-	-
SUBPIXEL_BITS	10	8	8	8	8	8	8	8	8	8	8	8	8
MAX_CLIP_DISTANCES	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_ELEMENTS_INDICES	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000
MAX_ELEMENTS_VERTICES	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M	1M
POINT_SIZE_RANGE	0.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.125	0.125	0.125
	64.0	64.0	64.0	64.0	64.0	64.0	63.375	63.375	63.375	63.375	64.0	64.0	64.0
POINT_SIZE_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
ALIASED_LINE_WIDTH_RANGE	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0
SMOOTH_LINE_WIDTH_RANGE	0.1	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	0.5 1.0	0.5 1.0	0.5 1.0	0.5 1.0	0.125 1.0	0.125 1.0	0.125 1.0
SMOOTH_LINE_WIDTH_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
MAX_COLOR_ATTACHMENTS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_DRAW_BUFFERS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX DUAL SOURCE DRAW BUFFERS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_SAMPLE_MASK_WORDS	1	1	1	1	1	1	1	1	1	1	1	1	1
MAX_SAMPLES	16	4	8	8	4	8	8	8	8	8	4	8	8
MAX_INTEGER_SAMPLES	10	1	1	1	1	1	1	1	1	1	1	1	1
IIVIAA IIVI EULI\ JAIVIELLJ													

MAX_COLOR_TEXTURE_SAMPLES	16	4	8	8	4	8	8	8	8	8	4	8	8
MAX_DEPTH_TEXTURE_SAMPLES	16	1	1	8	4	8	8	8	8	8	4	8	8
MAX_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384	16384
MAX_RECTANGLE_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384	16384
MAX_3D_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	2048	2048	2048	2048	2048	2048	2048
MAX_CUBE_MAP_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384	16384
MAX_ARRAY_TEXTURE_LAYERS	16384	512	512	2048	2048	2048	512	512	512	2048	512	2048	2048
MAX_TEXTURE_BUFFER_SIZE	2G	128M	64M	64M	64M								
MAX_TEXTURE_LOD_BIAS	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	16.0	16.0	16.0
MAX_TEXTURE_MAX_ANISOTROPY_EXT	16	16	16	16	16	16	16	16	16	16	16	16	16
NUM_COMPRESSED_TEXTURE_FORMATS	3 DXT1 DXT3 DXT5												
MAX_VERTEX_ATTRIBS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_UNIFORM_BLOCKS	64	14	14	14	14	14	12	12	12	14	13	13	15
MAX_VERTEX_UNIFORM_COMPONENTS	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096
MAX_VERTEX_UNIFORM_VECTORS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_VERTEX_OUTPUT_COMPONENTS	128	128	128	128	128	128	64	64	64	128	64	64	64
MAX_PATCH_VERTICES	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_INPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_TEXTURE_IMAGE_UNITS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_UNIFORM_BLOCKS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_UNIFORM_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_OUTPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_PATCH_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_CONTROL_TOTAL_OUTPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_GEN_LEVEL	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_INPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_TEXTURE_IMAGE_UNITS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_UNIFORM_BLOCKS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_UNIFORM_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_TESS_EVALUATION_OUTPUT_COMPONENTS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_GEOMETRY_INPUT_COMPONENTS	128	128	128	128	128	128	64	64	64	128	64	64	64
MAX_GEOMETRY_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_GEOMETRY_UNIFORM_BLOCKS	64	64	64	14	14	14	12	12	12	14	13	13	15
MAX_GEOMETRY_UNIFORM_COMPONENTS	4096	4096	4096	1024	1024	1024	2048	2048	2048	2048	4096	4096	4096
MAX_GEOMETRY_OUTPUT_COMPONENTS	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_GEOMETRY_TOTAL_OUTPUT_COMPONENTS	16384	16384	16384	16384	16384	16384	1024	1024	1024	1024	16384	16384	16384
MAX_GEOMETRY_OUTPUT_VERTICES	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_GEOMETRY_SHADER_INVOCATIONS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_FRAGMENT_INPUT_COMPONENTS	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_FRAGMENT_UNIFORM_BLOCKS	64	14	14	14	14	14	12	12	12	14	13	13	15
MAX_FRAGMENT_UNIFORM_COMPONENTS	4096	4096	4096	4096	4096	4096	2048	2048	2048	2048	4096	4096	4096
					_								

MIN_FRAGMENT_INTERPOLATION_OFFSET	_			_		_	_	_					
MAX_FRAGMENT_INTERPOLATION_OFFSET		_	_	_	_	_	_	_	_	_	_	_	_
FRAGMENT_INTERFOLATION_OFFSET_BITS	_	_	_	_	_	_	_	_	_	_	_	_	_
MIN_PROGRAM_TEXEL_OFFSET	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8
MAX_PROGRAM_TEXEL_OFFSET	7	7	7	7	7	7	7	7	7	7	7	7	7
MIN_PROGRAM_TEXTURE_GATHER_OFFSET	_	_	_	_	_	-	_	-	_	_	_	_	_
MAX_PROGRAM_TEXTURE_GATHER_OFFSET	_	_	_	_	_	_	_	_	_	_	_	_	_
MAX_PROGRAM_TEXTURE_GATHER_COMPONENTS_ARB	_	_	_	_	_	_	_	_	_	_	_	_	_
MAX_COMBINED_TEXTURE_IMAGE_UNITS	48	48	48	48	48	48	48	48	48	48	48	48	48
MAX_COMBINED_VERTEX_UNIFORM_COMPONENTS	16388K	228K	228K	228K	228K	228K	196K	196K	196K	228K	212K	212K	244K
MAX_COMBINED_TESS_CONTROL_UNIFORM_COMPONENTS	-		-	-	-	-	-	-	-	-	-	-	-
MAX_COMBINED_TESS_EVALUATION_UNIFORM_COMPONENTS		_	_	_	_	_	_	_	_	_	_	_	_
MAX_COMBINED_GEOMETRY_UNIFORM_COMPONENTS	16388K	1028K	1028K	225K	225K	225K	194K	194K	194K	226K	212K	212K	244K
MAX_COMBINED_FRAGMENT_UNIFORM_COMPONENTS	16388K	228K	228K	228K	228K	228K	194K	194K	194K	226K	212K	212K	244K
MAX COMBINED UNIFORM BLOCKS	64	64	64	64	64	64	36	36	36	64	39	64	64
MAX_UNIFORM_BLOCK_SIZE	1M	65536	65536	65536	65536	65536	65536	65536	65536	65536	65536	65536	65536
MAX_UNIFORM_BUFFER_BINDINGS	64	42	42	42	42	42	36	36	36	64	39	64	64
UNIFORM_BUFFER_OFFSET_ALIGNMENT	256	256	256	256	256	256	256	256	256	256	256	256	256
MAX SUBROUTINES	250	-	-	-	-	-	-		-		-	-	-
MAX_SUBROUTINES MAX_SUBROUTINE_UNIFORM_LOCATIONS	-	_	_	_	_	_	_	-	_	_	_	_	_
MAX_VARYING_VECTORS	_	-									_		
	-	-	-	-	-	-	-	-	-	-	-	-	-
SHADER_COMPILER	-	_	-	-	-	-			_	_	-		-
NUM_SHADER_BINARY_FORMATS	-	-		-	-	-	-	-	-	-	_	-	-
NUM_PROGRAM_BINARY_FORMATS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_XFB_INTERLEAVED_COMPONENTS	64	512	512	512	512	512	64	64	64	64	64	64	64
MAX_XFB_SEPARATE_ATTRIBS	4	4	4	4	4	4	4	4	4	4	4	4	4
MAX_XFB_SEPARATE_COMPONENTS	32	4	4	4	4	4	4	4	4	4	32	32	32
MAX_XFB_BUFFERS	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX_VERTEX_STREAMS	-	-	-	-	-	-	-	-	-	-	-	-	-
PRIMITIVES_GENERATED (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32
XFB_PRIMITIVES_WRITTEN (query bits)	32	32	32	32	32	32	32	32	32	32	32	32	32
SAMPLES_PASSED (query bits)	32	63	63	63	63	63	32	32	32	32	64	64	64
TIME_ELAPSED (query bits)	32	63	63	63	63	63	32	32	32	32	64	64	64
TIMESTAMP (query bits)	0	0	0	0	0	0	0	0	0	0	0	0	0
MAX_SERVER_WAIT_TIMEOUT	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E	16E
Hardware Accelerated		~	~	✓	~								
Backing Store	~	~	~	✓	~	~	~	~	~	~	~	✓	~
Compliant	~	~	~	~	~	~	~	~	~	~	~	~	~
Monoscopic	~	~	~	~	~	~	~	~	~	~	~	~	~
Stereoscopic		~	~	~	~	~	~	~	~				
Single Buffer	~	~	~	~	~	~	~	~	~	~	~	~	~
Double Buffer	~	~	~	~	~	~	~	~	~	~	~	✓	~

Color Buffer Modes (bpp RGB-A)	24-8	15-1 24-8	15-1 24-8	15-1 24-8	15-1 24-8	15-1 24-8	15	15	15	15	24-8	24-8	24-8
	96-32f	30-2 48-16 48-16h	30-2 48-16 48-16h	30-2 48-16 48-16h	30-2 48-16 48-16h	30-2 48-16 48-16h	24-8	24-8	24-8	24-8	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f
	00 02.	96-32f	96-32f	96-32f	96-32f	96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	00 021	00 021	00 021
Depth Buffer Modes (bpp)	0	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24
	32	32	32	32	32	32							
Stencil Buffer Modes (bpp)	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Sample Buffers	1	1	1	1	1	1	1	1	1	1	1	1	1
Max Samples	16	4	8	8	4	8	8	8	8	8	4	8	8
Supersampling	✓	~	~	✓	~	✓							
Multisampling		✓	~	✓	~	✓	~	~	~	~	~	~	~
Alphasampling	✓	~	~	~	~	✓	~	~	~	~	~	~	~
GPU Vertex Processing		✓	~	✓	~	✓	~	~	~	~	~	~	~
GPU Fragment Processing		~	~	✓	~	✓	~	~	~	~	~	~	~
Video Memory (megabytes)	0	128	256	1024	256	256	128 256	256	256	512	256 384	384 512	1024
			512			512	512		512	1024	512	768	
						1024	512	1024 1536		2048 4096		1024	
						2048	1536						

- This data describes functionality only. Actual rendering results may differ across renderers with identical reported capabilities; always verify your results on the real hardware.
 Renderers based on the same chipset (variants such as Pro/ Mobility) are condensed into single columns here. The exported capabilities are identical, the performance differs.

OpenGL Capabilities Tables
This table lists Core OpenGL extensions and parameter values reported for macOS 10.9. Click the name of a reported extension to view its specification.

HD Graphics 5000/Iris													
HD Graphics 4000													
HD Graphics 3000													
GeForce 640/650/660/675/680/750/755/775/780													
GeForce 320/330													
GeForce 9400/285/Quadro FX 4800													
GeForce 8600/8800/9600/120/130/Quadro FX 5600													
Radeon HD 5670/5750/5770/6630/6750/6770/6970													
Radeon HD 6490													
Radeon HD 5870													
Radeon HD 2600/4670/4850/4870													
Radeon HD 2400													
Software Renderer													
OpenGL Version	4.1	3.3	3.3	4.1	4.1	4.1	3.3	3.3	3.3	4.1	3.3	4.1	4.1
GLSL Version	4.10	3.30	3.30	4.10	4.10	4.10	3.30	3.30	3.30	4.10	3.30	4.10	4.10
ARB blend func extended	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB draw buffers blend	~	~	~	✓	~	~			~	~		~	~
ARB_draw_indirect	~			~	~	~				~		~	~
ARB ES2 compatibility	~	~	~	✓	~	~	~	~	~	~	~	~	~
ARB_explicit_attrib_location	~	~	~	✓	~	~	~	~	~	~	~	~	~
ARB_gpu_shader5	~			~	✓	~				~		~	~
ARB_gpu_shader_fp64	~			✓	~	~				~		~	~
ARB_instanced_arrays	~	~	~	✓	~	✓	~	~	~	~	~	~	~
ARB_internalformat_query	~	~	~	✓	~	~	~	~	~	~	~	~	~
ARB_occlusion_query2	~	~	~	✓	~	~	~	~	~	~	~	~	~
ARB sample shading	~			✓	~	~			~	~		~	~
ARB sampler objects	~	~	~	✓	~	~	~	~	~	~	~	~	~
ARB_separate_shader_objects	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB shader bit encoding	~	~	~	✓	~	✓	~	~	~	~	~	~	~
ARB_shader_subroutine	~			✓	~	~				~		~	~
ARB_shading_language_include	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_tessellation_shader	~			~	~	~				~		~	~
ARB_texture_buffer_object_rgb32	~	~	~	~	~	~				~		~	~
ARB_texture_cube_map_array	~			~	~	~			~	~		~	~
ARB texture gather	~			~	~	~				~		~	~
ARB texture query lod	~			~	~	✓			~	~		~	~
ARB texture rgb10 a2ui	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_texture_storage	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB texture swizzle	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_timer_query	~	~	~	~	~	~	~	~	~	~	~	~	~
ARB_transform_feedback2	~			~	~	~				~		~	~
ARB_transform_feedback3	~			~	~	✓				✓		✓	~

ADD ventey attails C4lait	,			,						,		,	,
ARB vertex attrib 64bit	✓			✓	~	~				~		~	✓
ARB vertex type 2 10 10 10 rev	~	✓	~	✓	✓	~	✓	✓	~	~	✓	~	~
ARB_viewport_array	~			✓	✓	~	✓	✓	✓	~		✓	~
EXT_debug_label	~	~	~	✓	✓	~	✓	✓	✓	~	✓	~	~
EXT_debug_marker	~	✓	~	✓	✓	~	✓	✓	✓	~	✓	✓	~
EXT_depth_bounds_test	~						✓	~	✓	~			
EXT_framebuffer_multisample_blit_scaled	✓						✓	~	✓	~			
EXT texture compression s3tc	~	✓	~	✓	✓	✓	~	✓	✓	✓	✓	✓	~
EXT_texture_filter_anisotropic	✓	✓	~	✓	✓	✓	✓						
EXT_texture_mirror_clamp	✓	~	~	✓									
EXT_texture_sRGB_decode	~	~	~	✓	✓	~	✓	~	✓	~	✓	~	~
APPLE_client_storage	~	~	~	✓	✓	~	~	~	✓	~	✓	✓	~
APPLE_container_object_shareable	~	~	~	✓	✓	~	~	~	✓	~	✓	✓	~
APPLE_flush_render	~	~	~	✓	✓	~	~	~	✓	~	✓	~	~
APPLE object purgeable		~	~	✓	✓	~	✓	~	✓	~	✓	✓	~
APPLE_rgb_422	~	~	~	✓	✓	✓	✓	✓	✓	~	✓	~	~
APPLE_row_bytes	~	✓	~	✓	✓	~	~	~	✓	~	✓	✓	~
APPLE_texture_range	✓	✓	~	✓	✓	✓	✓	✓	✓	~	✓	✓	~
ATI texture mirror once	~	~	~	✓	~	~	~	~	✓	~	~	~	~
NV_texture_barrier	~	~	~	✓	✓	~	✓	~	✓	~	✓	✓	~
MAX_RENDERBUFFER_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384	16384
MAX_VIEWPORTS	16	1	1	16	16	16	16	16	16	16	1	16	16
MAX_VIEWPORT_DIMS	16384.0	8192.0	8192.0	16384.0	16384.0	16384.0	8192.0	8192.0	8192.0	16384.0	8192.0	16384.0	16384.0
	16384.0	8192.0	8192.0	16384.0	16384.0	16384.0	8192.0	8192.0	8192.0	16384.0	8192.0	16384.0	16384.0
VIEWPORT_BOUNDS_RANGE	-32768.0		0.0			-32768.0							-32768.0
		0.0	0.0			32767.0		16384.0				32767.0	32767.0
LAYER_PROVOKING_VERTEX	undef	0	0			provoking						first	first
VIEWPORT_INDEX_PROVOKING_VERTEX	undef	0	0	first	first	first		provoking				first	first
VIEWPORT_SUBPIXEL_BITS	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBPIXEL_BITS	10	8	8	8	8	8	8	8	8	8	8	8	8
MAX_CLIP_DISTANCES	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_ELEMENTS_INDICES	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000	150000
MAX_ELEMENTS_VERTICES	1M	1M	1M										
POINT_SIZE_RANGE	0.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.125	0.125	0.125
	64.0	64.0	64.0	64.0	64.0	64.0	63.375	63.375		63.375	64.0	64.0	64.0
POINT_SIZE_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
ALIASED_LINE_WIDTH_RANGE	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0		1.0 1.0		1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0
SMOOTH_LINE_WIDTH_RANGE	0.1 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	1.0 1.0	0.5 1.0	0.5 1.0	0.5 1.0	0.5 1.0	0.125 1.0	0.125 1.0	0.125 1.0
SMOOTH_LINE_WIDTH_GRANULARITY	0.0001	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
MAX_COLOR_ATTACHMENTS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_DRAW_BUFFERS	8	8	8	8	8	8	8	8	8	8	8	8	8
MAX_DUAL_SOURCE_DRAW_BUFFERS	1	1	1	1	1	1		1	1	1	1	1	1
MAX SAMPLE MASK WORDS		1	1	1	1	1		1	•	1	1	1	1
MAX SAMPLES	16	4	8	8	4	8	8	8	8	8	4	8	8
MAX_INTEGER_SAMPLES		1	1	1	1	1				1	1	1	1
INIAA_INTEGER_SAINFEES	1	1		1		1	1	1	1	1		1	

MAX_COLOR_TEXTURE_SAMPLES	16	4	8	8	4	8	8	8	8	8	4	8	8
MAX_DEPTH_TEXTURE_SAMPLES	16	1	1	8	4	8	8	8	8	8	4	8	8
MAX_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384	16384
MAX_RECTANGLE_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384	16384
MAX_3D_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	2048	2048	2048	2048	2048	2048	2048
MAX_CUBE_MAP_TEXTURE_SIZE	16384	8192	8192	16384	16384	16384	8192	8192	8192	16384	8192	16384	16384
MAX_ARRAY_TEXTURE_LAYERS	16384	512	512	2048	2048	2048	512	512	512	2048	512	2048	2048
MAX_TEXTURE_BUFFER_SIZE	2G	128M	64M	64M	64M								
MAX_TEXTURE_LOD_BIAS	16.0	16.0	16.0	16.0	16.0	16.0	15.0	15.0	15.0	15.0	16.0	16.0	16.0
MAX_TEXTURE_MAX_ANISOTROPY_EXT	16	16	16	16	16	16	16	16	16	16	16	16	16
NUM_COMPRESSED_TEXTURE_FORMATS	3 DXT1 DXT3 DXT5												
MAX_VERTEX_ATTRIBS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_VERTEX_UNIFORM_BLOCKS	16	14	14	14	14	14	12	12	12	14	13	15	15
MAX_VERTEX_UNIFORM_COMPONENTS	4096	3072	3072	3072	3072	3072	4096	4096	4096	4096	4096	4096	4096
MAX_VERTEX_UNIFORM_VECTORS	1024	768	768	768	768	768	1024	1024	1024	1024	1024	1024	1024
MAX_VERTEX_OUTPUT_COMPONENTS	128	128	128	128	128	128	64	64	64	128	64	128	128
MAX_PATCH_VERTICES	32	0	0	32	32	32	0	0	0	32	0	32	32
MAX_TESS_CONTROL_INPUT_COMPONENTS	128	0	0	128	128	128	0	0	0	128	0	128	128
MAX_TESS_CONTROL_TEXTURE_IMAGE_UNITS	16	0	0	16	16	16	0	0	0	16	0	16	16
MAX_TESS_CONTROL_UNIFORM_BLOCKS	16	0	0	14	14	14	0	0	0	14	0	15	15
MAX_TESS_CONTROL_UNIFORM_COMPONENTS	4096	0	0	3072	3072	3072	0	0	0	2048	0	4096	4096
MAX_TESS_CONTROL_OUTPUT_COMPONENTS	128	0	0	128	128	128	0	0	0	128	0	128	128
MAX_TESS_PATCH_COMPONENTS	120	0	0	120	120	120	0	0	0	120	0	120	120
MAX_TESS_CONTROL_TOTAL_OUTPUT_COMPONENTS	4216	0	0	4216	4216	4216	0	0	0	4216	0	4216	4216
MAX_TESS_GEN_LEVEL	64	0	0	64	64	64	0	0	0	64	0	64	64
MAX_TESS_EVALUATION_INPUT_COMPONENTS	128	0	0	128	128	128	0	0	0	128	0	128	128
MAX_TESS_EVALUATION_TEXTURE_IMAGE_UNITS	16	0	0	16	16	16	0	0	0	16	0	16	16
MAX_TESS_EVALUATION_UNIFORM_BLOCKS	16	0	0	14	14	14	0	0	0	14	0	15	15
MAX_TESS_EVALUATION_UNIFORM_COMPONENTS	4096	0	0	3072	3072	3072	0	0	0	2048	0	4096	4096
MAX_TESS_EVALUATION_OUTPUT_COMPONENTS	128	0	0	128	128	128	0	0	0	128	0	128	128
MAX_GEOMETRY_INPUT_COMPONENTS	128	128	128	128	128	128	64	64	64	128	64	128	128
MAX_GEOMETRY_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_GEOMETRY_UNIFORM_BLOCKS	16	14	14	14	14	14	12	12	12	14	13	15	15
MAX_GEOMETRY_UNIFORM_COMPONENTS	4096	3072	3072	3072	3072	3072	2048	2048	2048	2048	4096	4096	4096
MAX_GEOMETRY_OUTPUT_COMPONENTS	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_GEOMETRY_TOTAL_OUTPUT_COMPONENTS	16384	16384	16384	16384	16384	16384	1024	1024	1024	1024	16384	16384	16384
MAX_GEOMETRY_OUTPUT_VERTICES	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024	1024
MAX_GEOMETRY_SHADER_INVOCATIONS	32	1	1	32	32	32	1	1	1	32	1	32	32
MAX_FRAGMENT_INPUT_COMPONENTS	128	128	128	128	128	128	128	128	128	128	128	128	128
MAX_TEXTURE_IMAGE_UNITS	16	16	16	16	16	16	16	16	16	16	16	16	16
MAX_FRAGMENT_UNIFORM_BLOCKS	16	14	14	14	14	14	12	12	12	14	13	15	15
MAX_FRAGMENT_UNIFORM_COMPONENTS	4096	3072	3072	3072	3072	3072	2048	2048	2048	2048	4096	4096	4096

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MIN_FRAGMENT_INTERPOLATION_OFFSET	0 -0.5			-0.5
	0.5	0.0	-0.5 0.5	0.5
FRAGMENT INTERPOLATION OFFSET BITS 4 0 0 4 4 4 0 0 0 0	4	0.0	4	4
MIN_PROGRAM_TEXEL_OFFSET		-8	-8	-8
MAX_PROGRAM_TEXEL_OFFSET 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	7	7	7	7
MIN_PROGRAM_TEXTURE_GATHER_OFFSET	-32	0	-8	-8
MAX_PROGRAM_TEXTURE_GATHER_OFFSET	31	0	7	7
MAX_PROGRAM_TEXTURE_GATHER_COMPONENTS_ARB 4 0 0 4 4 4 0 0 0	4	0	4	4
MAX_PROGRAM_TEXTORE_GATHER_COMPONENTS_ARB 4 0 0 4 4 4 4 0 0 0 0 0 0 0 0 0 0 0 0		48	80	80
MAX COMBINED VERTEX UNIFORM COMPONENTS 260K 227K 227K 227K 227K 196K 196K 196K 196K		212K	244K	244K
MAX COMBINED TESS CONTROL UNIFORM COMPONENTS 260K 0 0 227K 227K 227K 0 0 0	226K	0	244K	244K
MAX_COMBINED_TESS_CONTROL_ONIFORM_COMPONENTS 260K 0 0 227K 227K 0 0 0 0 MAX_COMBINED_TESS_EVALUATION_UNIFORM_COMPONENTS 260K 0 0 227K 227K 0 0 0 0	226K	0	244K	244K
MAX_COMBINED_TESS_EVALUATION_COMPONENTS		212K	244K	244K
MAX_COMBINED_FRAGMENT_UNIFORM_COMPONENTS 260K 227K 227K 227K 227K 194K 194K 194K 194K 194K 194K 194K 194		212K	244K	244K
MAX_COMBINED_UNIFORM_BLOCKS 80 42 42 70 70 70 36 36 36 36 MAX_UNIFORM_BLOCK_SIZE 65536 65556 65556 65556 65556 65556 65556 65556 65556 65556 6556 6556 6556 6556 6556 6556 6556 6556 6556 6556 6556 6556 6556 6556 6556 6556 6556 65		39	75 65536	75
	5536 65536	65536		65536 75
		39	75	
UNIFORM_BUFFER_OFFSET_ALIGNMENT 256 256 256 256 256 256 256 256 256 256		256	256	256
MAX_SUBROUTINES 4096 0 0 256 256 0 0 0 0	1024	0	4096	4096
MAX_SUBROUTINE_UNIFORM_LOCATIONS 4096 0 0 1024 1024 0 0 0	1024	0	4096	4096
MAX_VARYING_VECTORS 32 32 32 32 15 15 15 15		15	15	15
SHADER_COMPILER	1	1	1	1
NUM_SHADER_BINARY_FORMATS 0 <td>0</td> <td>0</td> <td>0</td> <td>0</td>	0	0	0	0
NUM_PROGRAM_BINARY_FORMATS 0 0 0 0 0 0 0 0	0	0	0	0
MAX_XFB_INTERLEAVED_COMPONENTS 64 64 64 64 64 64 64 64 64		64	64	64
MAX_XFB_SEPARATE_ATTRIBS 4 <td>4</td> <td>4</td> <td>4</td> <td>4</td>	4	4	4	4
MAX_XFB_SEPARATE_COMPONENTS 4 4 4 4 4 4 4 4 4 4 4 4	4	4	4	4
MAX_XFB_BUFFERS 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4	4	4	4
MAX_VERTEX_STREAMS 4 0 0 4 4 4 0 0 0 0	4	0	4	4
PRIMITIVES_GENERATED (query bits) 32 32 32 32 32 32 32 32 32 32 32		32	32	32
XFB_PRIMITIVES_WRITTEN (query bits) 32 32 32 32 32 32 32 32 32	32	32	32	32
SAMPLES_PASSED (query bits) 32 63 63 63 63 32 32 32		64	64	64
TIME_ELAPSED (query bits) 32 32 32 32 32 32 32 32 32 32 32	32	32	32	32
TIMESTAMP (query bits) 0 0 0 0 0 0 0 0 0	0	0	0	0
MAX_SERVER_WAIT_TIMEOUT 16E 16E 16E 16E 16E 16E 16E 16E 16E	E 16E	16E	16E	16E
Hardware Accelerated	~	~	~	~
Backing Store	~	~	~	~
Compliant	~	~	~	~
Monoscopic	~	~	~	~
Stereoscopic				
oreienscohic				
Single Buffer	~	✓	✓	~

Color Buffer Modes (bpp RGB-A)	24-8	15-1 24-8	15-1 24-8	15-1 24-8	15-1 24-8	15-1 24-8	15	15	15	15	24-8	24-8	24-8
		30-2 48-16	30-2 48-16	30-2 48-16	30-2 48-16	30-2 48-16	24-8	24-8	24-8	24-8	48-16h	48-16h	48-16h
	96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	48-16h 96-32f	96-32f	96-32f	96-32f
Depth Buffer Modes (bpp)	0	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24 32	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24	0 16 24
Stencil Buffer Modes (bpp)	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Sample Buffers	1	1	1	1	1	1	1	1	1	1	1	1	1
Max Samples	16	4	8	8	4	8	8	8	8	8	4	8	8
Supersampling	~	~	~	~	~	~							
Multisampling		~	~	~	~	✓	~	~	~	~	~	~	~
Alphasampling	~	~	~	~	~	~	~	~	~	~	~	~	~
GPU Vertex Processing		~	~	~	~	~	~	~	~	~	~	~	~
GPU Fragment Processing		~	~	~	~	~	~	✓	~	~	✓	~	~
Video Memory (megabytes)	0	128	256	1024	256	256	128 256	256	256	512	256 384	384 512	1024
			512			512			512	1024	512	768	
						1024	512	1024 1536		2048 4096		1024	
						2048	1536						

- This data describes functionality only. Actual rendering results may differ across renderers with identical reported capabilities; always verify your results on the real hardware.
- Renderers based on the same chipset (variants such as Pro/ Mobility) are condensed into single columns here. The exported capabilities are identical, the performance differs.
- ARB_gpu_shader_fp64 functionality is implied by OpenGL 4.0, but not exported on renderers marked by "~"
- ARB_vertex_attrib_64bit functionality is implied by OpenGL 4.1, but not exported on renderers marked by "~"

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