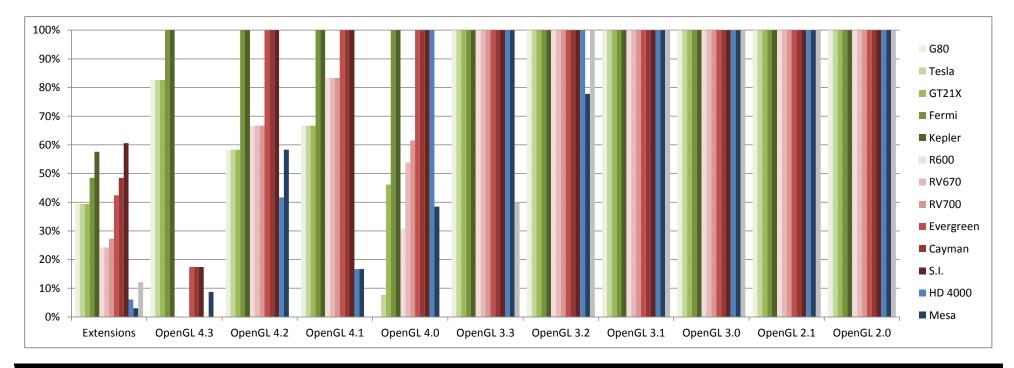
OpenGL Matrix - January 2013 G-Truc Creation

Vendor			NVIDIA	4					AMD			Intel	Mesa	Apple
Drivers version		;	313.95 b	eta				1	3.02 beta			15.31.64.2885	9.1 branch	10.8.2
Release date		2	28/01/20	013				18	3/01/2013			16/12/2012	22/01/2013	05/10/2012
Platforms	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
Extensions	39%	39%	39%	48%	58%	24%	24%	27%	42%	48%	61%	6%	3%	12%
OpenGL 4.3	83%	83%	83%	100%	100%	0%	0%	0%	17%	17%	17%	0%	9%	0%
OpenGL 4.2	58%	58%	58%	100%	100%	67%	67%	67%	100%	100%	100%	42%	58%	0%
OpenGL 4.1	67%	67%	67%	100%	100%	83%	83%	83%	100%	100%	100%	17%	17%	0%
OpenGL 4.0	0%	8%	46%	100%	100%	31%	54%	62%	100%	100%	100%	100%	38%	0%
OpenGL 3.3	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	40%
OpenGL 3.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	78%	100%
OpenGL 3.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
OpenGL 3.0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
OpenGL 2.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
OpenGL 2.0	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%



OpenGL Extensions	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
AMD vertex shader viewport index	X	Χ	X	Χ	Χ	Χ	Χ	Χ	V	V	V	Χ	X	Χ
AMD vertex shader layer	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	V	V	V	Χ	X	X
NV vertex buffer unified memory	V	V	V	V	V	Χ	X	Χ	Χ	Χ	Χ	X	X	X
AMD transform feedback3 lines triangles	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	V	V	Χ	X	X
EXT texture sRGB decode	Χ	Χ	X	V	V	Χ	X	Χ	V	V	V	Χ	X	V
KHR texture compression astc ldr	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	Χ	X	X	X
NV texture multisample	V	V	V	V	V	Χ	X	Χ	Χ	Χ	Χ	X	X	Χ
EXT texture mirror clamp	V	V	V	V	V	V	V	V	V	V	V	Χ	X	V
ARB robustness	V	V	V	V	V	Χ	X	Χ	Χ	Χ	Χ	X	X	X
AMD stencil operation extended	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	V	Χ	X	X
AMD sparse texture	X	X	X	X	Χ	Χ	X	X	X	X	V	X	X	X
ARB shading language include	V	V	V	٧	V	Χ	Χ	X	X	X	Χ	X	Χ	X

		X :	X	X	X .	X X	X	X	X	V	X	X	X	
ARB shader stencil export	Χ	X :	X	X :	X :	x x	X	V	V	V	X	X	X	
NV shader buffer store	X	X :	X	٧ '	V	x x	X	X	Х	Х	X	X	X	
NV shader buffer load	V	٧ '	V	۷ '	V :	x x	X	Χ	X	Χ	Х	X	X	
NV shader atomic float	X	X :	X	٧'	V :	x x	X	Χ	Χ	Χ	X	X	X	
AMD seamless cubemap per texture	X	X :	X	X	V :	X X	V	V	V	V	X	X	X	
AMD sample positions	X	X :	X	X :	X	V V	′ V	V	V	V	X	X	X	
AMD query buffer object	X	X :	X	X	X	X X	X	V	V	V	X	X	X	
AMD pinned memory	X	X :	X	X :	X	V V	′ V	V	V	V	X	X	X	
NV multisample coverage	V	٧ '	V	٧ '	V :	X X	X	X	X	X	X	X	X	
INTEL map texture	X	X :	X	X	X	X X	X	X	X	X	V	X	X	
EXT framebuffer multisample blit scaled	X	X	X	X	V	X X	X	X	X	X	X	X	V	
NV explicit multisample	V	٧ '	V	۷ '	۷ '	V V	′ V	V	V	V	X	X	X	
EXT direct state access	V	٧ '	V	۷ '	۷ '	V V	′ V	V	V	V	X	X	X	
EXT depth bounds test	V	٧ '	V	۷ '	V	X X	X	X	X	V	X	X	V	
ARB debug output	V	٧ '	V	۷ '	۷ '	V V	′ V	V	V	V	X	V	X	
NV copy image	V	٧ '	V	۷ '	۷ '	V V	′ V	V	V	V	X	X	X	
ARB compatibility	V	٧ '	V	٧ '	٧ '	V V	′ V	V	V	V	V	X	X	
ARB cl event	X	X :	X	X	X :	X X	X	X	X	X	X	X	X	
AMD blend minmax factor	X	X :	X	X	X	X X	X	X	V	V	X	X	X	
NV bindless texture	Χ	X	X	X	V	X X	X	X	X	Х	X	X	X	
Support	39%	39%	39%	48%	58%	24%	24%	27%	42%	48%	61%	6%	3%	12%

OpenGL 4.3	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL ARB vertex attrib binding	V	V	V	V	V	X	Χ	Χ	Х	Χ	Χ	X	Χ	Χ
GL ARB texture view	V	V	V	V	V	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	Χ
GL ARB texture storage multisample	V	V	V	V	V	Χ	Χ	X	V	V	V	X	Χ	X
GL ARB texture query levels	V	V	V	V	V	Χ	Χ	X	X	Х	Χ	X	X	X
GL ARB texture buffer range	V	V	V	V	V	Χ	Χ	X	V	V	V	X	X	X
GL ARB stencil texturing	V	V	V	V	V	Χ	Χ	Χ	X	Х	Χ	X	Χ	X
GL ARB shader storage buffer object	X	Χ	Χ	V	V	Χ	Χ	X	Χ	Χ	Χ	X	Χ	X
GL ARB shader image size	X	X	Χ	V	V	Χ	Χ	X	Χ	X	Χ	X	X	X
GL ARB robustness isolation	V	V	V	V	V	Χ	Χ	X	Χ	Χ	Χ	X	X	X

GL ARB robust buffer access behavior	V	V	V	٧	V	X	Χ	Χ	Χ	Х	Х	Χ	Χ	Χ	
GL ARB program interface query	V	V	V	V	V	X	Χ	X	Χ	Х	Х	Χ	X	Χ	
GL ARB multi draw indirect	X	Χ	Χ	V	V	X	X	X	V	V	V	X	X	X	
GL ARB invalidate subdata	V	V	V	V	V	X	Χ	Χ	X	X	Х	X	V	X	
GL ARB internalformat query2	V	V	V	V	V	Χ	Χ	Χ	Χ	Χ	Χ	Χ	X	X	
GL ARB framebuffer no attachments	V	V	V	V	V	Χ	Χ	X	Χ	X	X	Χ	X	X	
GL ARB fragment layer viewport	V	V	V	V	V	Χ	X	X	V	V	V	X	X	X	
GL ARB explicit uniform location	V	V	V	V	V	X	Χ	Χ	Χ	X	X	Χ	X	X	
GL ARB ES3 compatibility	V	V	V	V	V	X	Χ	Χ	Χ	X	X	Χ	V	X	
GL KHR debug	V	V	V	V	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	
GL ARB copy image	V	V	V	V	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	
GL ARB compute shader	X	Χ	Χ	V	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	
GL ARB clear buffer object	V	V	V	V	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	
GL ARB arrays of arrays	V	V	V	V	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ	
Support	83%	6 83 ⁹	% 83%	6 100%	6 100%	6 0%	5 0%	6 09	6	17%	17% 17	%	0%	9%	0%
-															
OpenGL 4.2	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergre	en Cayn	nan S.I.	HD 4000	Mesa	MacO	S X

OpenGL 4.2	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL ARB transform feedback instanced	X	Χ	Χ	V	V	V	V	V	V	V	٧	X	V	X
GL ARB texture compression bptc	Χ	Χ	Χ	V	V	Χ	Χ	Χ	V	V	V	X	Χ	X
GL ARB texture storage	V	V	V	V	V	V	V	V	V	V	V	V	V	X
GL ARB shading language packing	V	V	V	V	V	V	V	V	V	V	V	X	V	X
GL ARB shading language 420pack	V	V	V	V	V	V	V	V	V	V	V	X	Χ	X
GL ARB shader image load store	Χ	Χ	Χ	V	V	Χ	X	X	V	V	V	X	Χ	Χ
GL ARB shader atomic counters	Χ	Χ	Χ	V	V	Χ	Χ	X	V	V	V	X	Χ	X
GL ARB map buffer alignment	V	V	V	V	V	V	V	V	V	V	V	V	V	X
GL ARB internalformat query	V	V	V	V	V	V	V	V	V	V	V	V	V	X
GL ARB conservative depth	V	V	V	V	V	V	V	V	V	V	V	V	V	X
GL ARB compressed texture pixel storage	V	V	V	V	V	V	V	V	٧	V	V	X	Χ	X
GL ARB base instance	Χ	Χ	Χ	V	V	Χ	Χ	Χ	V	V	V	V	V	X
Support	58%	58%	58%	100%	100%	67%	67%	67%	100%	100%	100%	42	% 5	8% 0%

OpenGL 4.1	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL ARB viewport array	V	V	V	V	V	V	V	V	V	V	V	Χ	Х	Χ

GL ARB vertex attrib 64bit	X	Χ	Χ	V	V	X	Χ	Χ	V	V		V	Χ	Χ	X	
GL ARB shader precision	X	Χ	Χ	V	V	V	V	V	V	V		V	Χ	Χ	X	
GL ARB separate shader objects	V	V	V	V	V	V	V	V	V	V		V	Χ	Χ	X	
GL ARB get program binary	V	V	V	V	V	V	V	V	V	V		V	Χ	X	X	
GL ARB ES2 compatibility	V	V	V	V	V	V	V	V	V	V		V	٧	V	X	
Support	67	% 67	% 6	7% 100	% 100	% 83%	6 839	6 83°	% :	100%	100%	100%		17%	17%	0%
OpenGL 4.0	G80	Tesla	GT2	LX Ferm	i Kepler	R600	RV670	RV700) Evergre	een Ca	yman	S.I.	HD 4000	Mesa	Mac	OS X

OpenGL 4.0	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X	
GL ARB transform feedback3	Χ	X	X	V	V	V	V	V	V	V	V	V	V	X	
GL ARB transform feedback2	Χ	V	V	V	V	V	V	V	٧	V	V	V	V	X	
GL ARB texture query lod	Χ	Χ	V	V	V	Χ	Χ	V	٧	V	V	V	X	X	
GL ARB texture gather	X	Χ	V	V	V	Χ	V	V	V	V	V	V	X	X	
GL ARB texture cube map array	Χ	Χ	V	V	V	Χ	V	V	٧	V	V	V	V	X	
GL ARB texture buffer object rgb32	Χ	Χ	Χ	V	V	V	V	V	V	V	V	V	V	X	
GL ARB tessellation shader	Χ	Χ	X	V	V	Χ	Χ	X	V	V	V	V	X	X	
GL ARB shader subroutine	X	Χ	X	V	V	Χ	Χ	X	V	V	V	V	X	X	
GL ARB sample shading	Χ	Χ	V	V	V	Χ	V	V	V	V	V	V	X	X	
GL ARB gpu shader5	Χ	Χ	Χ	V	V	Χ	Χ	X	V	V	V	V	X	X	
GL ARB gpu shader fp64	X	Χ	Χ	V	V	Χ	Χ	X	V	V	V	V	X	X	
GL ARB draw indirect	X	Χ	Χ	V	V	Χ	Χ	Χ	V	V	V	V	X	X	
GL ARB draw buffers blend	Χ	Χ	V	V	V	V	V	V	٧	V	V	V	V	X	
Support	0%	6 8%	46%	100%	100%	31%	54%	62%	100%	100%	100%	6 10	00%	38%)%

OpenGL 3.3	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL ARB vertex type 2 10 10 10 rev	V	V	V	V	V	V	V	V	٧	V	V	V	V	X
GL ARB timer query	V	V	V	V	V	V	V	V	٧	V	V	V	V	V
GL ARB texture swizzle	V	V	V	V	V	V	V	V	٧	V	V	V	V	X
GL ARB texture rgb10 a2ui	V	V	V	V	V	V	V	V	٧	V	V	V	V	X
GL ARB shader bit encoding	V	V	V	V	V	V	V	V	٧	V	V	V	V	V
GL ARB sampler objects	V	V	V	V	V	V	V	V	٧	V	V	V	V	X
GL ARB occlusion query2	V	V	V	V	V	V	V	V	٧	V	V	V	V	V
GL ARB instanced arrays	V	V	V	V	V	V	V	V	٧	V	V	V	V	V
GL ARB explicit attrib location	V	V	V	V	V	V	V	V	٧	V	V	V	V	X

GL ARB blend func extended	V	٧	V	V	V	٧	V	V	V	V	V	V	V	X
Support	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	10	0%	100% 40%
OpenGL 3.2	C00	Toolo	CT24V	Гомогі	V a mla n	DCOO	DV/C70	D) /700	Буриянори	Carriaga	CI	HD 4000	N.4.0.00	MacOS X
GL ARB vertex array bgra	G80	Tesla V	GT21X V	V	Kepler V			V	Evergreen V	Cayman	5.I. V	HD 4000 V	Mesa V	V
·	V	V	V	V	V	V	V	V V	V	V	V	V	V	V
GL ARB texture multisample GL ARB sync	V	V	V	V	V	V	V	V V	V	V	V	V	V	V
GL ARB seamless cube map	V	V	V	V	V	V	V	v V	V	V	V	V	V	V
GL ARB provoking vertex	V	V	V	V	V	V	•	v V	V	V	V	V	V	V
	V	V	V	V	V	V	•	v V	V	V	V	V	V	V
GL ARB geometry shader4 GL ARB fragment coord conventions	V	V	V	V	V	V		v V	V	V	V	V	_^ V	V
GL ARB depth clamp	V	V	V	V	V	V	•	V V	V	V	V	V	V	V
GL ARB depth clamp GL ARB draw elements base vertex	V	V	V	V	V	V	•	v V	V	V	V	V	V	V
Support	100%	V	V	100%	V	100%	•	•	V	V	100%	10	V	78% 100%
Support	100/0	100/6	100 /6	100%	100%	100%	100%	100 /6	100%	100%	100/0	10	J /0	78/0 100/0
OpenGL 3.1	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL ARB uniform buffer object	V	V	V	V	V	V		V	V	V	V	V	V	V
GL EXT texture snorm	V	V	V	V	V	V	•	V	V	V	V	V	V	V
GL ARB texture rectangle	V	V	V	V	V	V	•	V	V	V	V	V	V	V
GL ARB texture buffer object	V	V	V	V	V	•	•	V	V	V	V	V	V	V
GL NV primitive restart	V	V	V	V	V	V		V	V	V	V	V	V	V
GL ARB draw instanced	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB copy buffer	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Support	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	10	0%	100% 100%
OpenGL 3.0	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL ARB vertex array object	V	٧	V	V	V			V	٧	V	٧	V	V	V
GL EXT transform feedback	V	٧	V	V	V	٧	V	V	٧	V	٧	V	V	V
GL ARB texture rg	V	V	V	V	V	V	V	V	V	V	٧	V	V	V
GL EXT texture shared exponent	V	V	V	V	V	V	V	V	V	V	٧	V	V	V
GL EXT texture integer	V	V	V	V	V	٧	V	V	V	V	٧	V	V	V
GL ARB texture float	V	٧	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB texture compression rgtc	V	V	V	V	V	V	V	V	V	V	V	V	V	V

GL EXT texture array	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL EXT packed float	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL EXT packed depth stencil	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB map buffer range	V	V	V	V	V	V	V	V	V	V	V	٧	V	V
GL ARB half float vertex	V	V	V	V	V	V	V	V	V	V	V	٧	V	V
GL ARB half float pixel	V	V	V	V	V	V	V	V	V	V	V	٧	V	V
GL EXT gpu shader4	V	V	V	V	V	V	V	V	V	V	V	٧	V	V
GL ARB framebuffer sRGB	V	V	V	V	V	V	V	V	V	V	V	٧	V	V
GL ARB framebuffer object	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB depth buffer float	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL NV conditional render	V	V	V	V	V	V	V	V	V	V	V	٧	V	V
GL ARB color buffer float	V	V	V	V	V	V	V	V	V	V	V	٧	V	V
Support	100%	6 100%	% 100%	100%	100%	100%	100%	100%	100%	100%	100%	1	00%	100% 100%
• •														
OpenGL 2.1	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL EXT texture sRGB	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB pixel buffer object	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Support	1009	6 100%	% 100%	100%	100%	100%	100%	100%	100%	100%	100%	1	00%	100% 100%
Support	1007	0 1007	0 10076	2007	20070	20070	10076	100%	10070	10070	10076		3070	10070
OpenGL 2.0	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL ARB vertex shader	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB texture non power of two	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL EXT stencil two side	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB shading language 100	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB shader objects	V	ν \/	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB point sprite	V	\ \/	V	V	V	V V	V	V	V	V	V	V	V	V
·	V	V	V	V	V	V V	V	V	V	V	V V	\ \/	V	V
GL ARB fragment shader	V	V	V	V	V	V	V	V	V	V	V	V	V	V

٧

٧

100%

٧

100%

100%

100%

100% 100%

٧

V

GL ARB draw buffers

Support

GL EXT blend equation separate