OpenGL Matrix - September 2013 G-Truc Creation

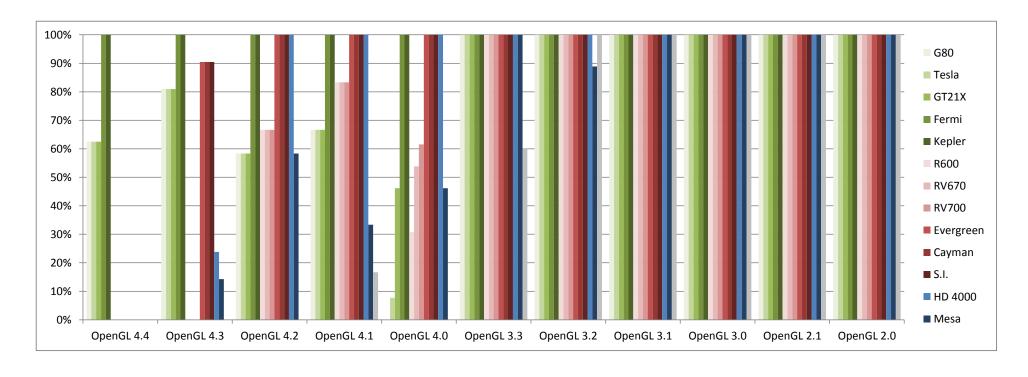
Vendor		NVIDIA							AMD			Intel	Mesa	Apple	
Drivers version		3	326.98 b	eta					13.4			10.18.10.3277	git-9.2	10.8.3	
Release date		2	28/08/20)13				24	/04/2013			30/08/2013	30/03/2013	14/03/2013	
Platforms	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X	
OpenGL 4.4	63%	63%	63%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
OpenGL 4.3	81%	81%	81%	100%	100%	0%	0%	0%	90%	90%	90%	24%	14%	0%	
OpenGL 4.2	58%	58%	58%	100%	100%	67%	67%	67%	100%	100%	100%	100%	58%	0%	
OpenGL 4.1	67%	67%	67%	100%	100%	83%	83%	83%	100%	100%	100%	100%	33%	17%	
OpenGL 4.0	0%	8%	46%	100%	100%	31%	54%	62%	100%	100%	100%	100%	46%	0%	
OpenGL 3.3	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	60%	
OpenGL 3.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	89%	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%	

Nomenclature:

Supported

Not supported

Changes with previous report



OpenGL Extensions	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
KHR texture compression astc ldr	Χ	Х	Х	X	Х	Χ	Х	Х	Х	Х	Χ	Х	Х	X
ARB robustness	V	V	V	V	V	Χ	Χ	Χ	Χ	Χ	Χ	X	X	X
ARB sparse texture	Χ	Χ	Χ	V	V	Χ	Χ	Χ	Χ	Χ	Χ	X	X	X
ARB shading language include	V	V	V	V	V	Χ	Χ	X	X	Χ	Χ	X	X	X
ARB shader stencil export	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	V	V	V	X	X	X
ARB shader group vote	Χ	Χ	Χ	V	V	Χ	Χ	Χ	Χ	Χ	Χ	X	X	X
ARB shader draw parameters	X	Χ	X	V	V	Χ	Χ	X	Χ	Χ	Χ	X	X	X
ARB seamless cubemap per texture	Χ	X	Χ	Χ	V	Χ	Χ	X	Χ	Χ	Χ	X	X	X
ARB robustness isolation	V	V	V	V	V	Χ	Χ	X	X	Χ	Χ	X	X	X
ARB robust buffer access behavior	V	V	V	V	V	Χ	Χ	X	X	Χ	Χ	X	X	X
ARB debug output	V	V	V	V	V	V	V	٧	V	V	V	X	V	X

ARB indirect parameters	Χ	Χ	Χ	V	V	X	Χ	Χ	X	X	Χ	Χ	Х	X
ARB compute variable group size	Χ	Χ	X	V	V	X	Χ	Χ	Χ	Χ	Х	Χ	X	Χ
ARB compatibility	V	V	V	V	V	V	V	V	V	V	V	V	X	Χ
ARB cl event	Χ	Χ	Х	Х	Х	Х	Χ	Х	Χ	Х	Х	Х	X	Χ
ARB bindless texture	Χ	Χ	X	X	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	Χ
EXT texture sRGB decode	Χ	Χ	X	V	V	X	Χ	Χ	V	V	V	V	X	V
EXT texture mirror clamp	٧	V	V	V	V	V	V	V	V	V	V	X	X	V
EXT framebuffer multisample blit scaled	Χ	Χ	Х	Х	V	X	Χ	Х	Χ	Х	Х	X	X	V
EXT direct state access	V	V	V	V	V	V	V	V	V	V	V	X	X	X
EXT depth bounds test	V	V	V	V	V	X	Χ	Χ	Χ	X	V	X	X	V
NV vertex buffer unified memory	V	V	V	V	V	X	Χ	Χ	Χ	X	Χ	Χ	X	X
NV texture multisample	V	V	V	V	V	X	Χ	Χ	Χ	Χ	X	Χ	X	X
NV shader buffer store	X	Χ	X	V	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	X
NV shader buffer load	V	V	V	V	V	X	Χ	Χ	Χ	Χ	X	Χ	X	X
NV shader atomic float	X	Χ	Х	V	V	X	Χ	Χ	Χ	X	Χ	Χ	X	X
NV multisample coverage	V	V	V	V	V	X	Χ	Χ	Χ	Χ	X	Χ	X	X
NV explicit multisample	V	V	V	V	V	V	V	V	V	V	V	X	X	X
NV copy image	V	V	V	V	V	V	V	V	V	V	V	X	X	X
NV bindless texture	Χ	Χ	X	Х	V	X	Χ	Х	Χ	Х	Х	X	X	X
NV bindless multi draw indirect	X	Χ	X	V	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	X
NV blend equation advanced	X	Χ	X	V	V	X	Χ	Χ	Χ	Χ	Χ	Χ	X	X
INTEL map texture	X	Χ	X	X	X	X	Χ	Χ	Χ	Χ	Χ	V	X	X
ATI texture mirror once	V	V	V	V	V	V	V	V	V	V	V	X	X	V
AMD vertex shader viewport index	X	Χ	X	X	X	X	Χ	Χ	V	V	V	X	X	X
AMD vertex shader layer	X	Χ	X	X	X	X	Χ	Χ	V	V	V	X	X	X
AMD transform feedback3 lines triangles	X	Χ	X	X	X	X	Χ	Χ	Χ	V	V	X	X	X
AMD stencil operation extended	X	Χ	X	X	X	X	Χ	Χ	Χ	X	V	X	X	X
AMD sparse texture	X	Χ	X	X	X	X	Χ	Χ	Χ	Χ	V	X	X	X
AMD shader trinary minmax	Χ	Χ	X	X	X	Χ	Χ	Χ	Χ	Χ	V	X	X	X
AMD seamless cubemap per texture	X	Χ	X	X	V	X	Χ	V	V	V	V	X	X	X
AMD sample positions	X	Χ	Χ	Χ	X	V	V	V	V	V	V	X	X	X
AMD query buffer object	Χ	Χ	Χ	Χ	X	X	Χ	Х	V	V	V	X	X	X
AMD pinned memory	X	Χ	Χ	Χ	Χ	V	V	V	V	V	V	X	X	Χ

AMD blend minmax factor	X	Χ	Χ	Χ	Χ	Χ	Χ	Χ	Χ	V	٧	1	Χ	Χ	Χ	
Support	36%	36%	36%	58%	69%	20%	20%	22%	Ś	33%	38%	47%		7%	2%	11%
OpenGL 4.4	G80	Tesla		Fermi		R600			Evergre		/man S		HD 4000	Mesa	MacO	S X
ARB buffer storage	X	X	X		V	X	X	X	X	X	Х		X	X	X	
ARB clear texture	X	X	X		V	X	X	X	X	X	X		X	X	X	
ARB enhanced layouts	V	V	V	•	V	X	X	X	X	X	Х		X	X	X	
ARB multi bind	V	V	V		V	X	X	X	X	X	Х		X	X	X	
ARB query buffer object	X	Х	Х		V	Х	X	X	X	Х	X		X	X	X	
ARB texture mirror clamp to edge	V	V	V	•	V	Х	X	X	X	Х	X		X	X	X	
ARB texture stencil8	V	V	V	•	V	Х	X	X	X	X	X		X	X	X	
ARB vertex type 10f 11f 11f rev	V	V	V	•	V		Χ	Χ	X	Х	Х		Χ	X	X	
Support	81%	81%	81%	100%	100%	0%	0%	0%	,)	90%	90%	90%		24%	14%	0%
OpenGL 4.3	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergre	een Cay	/man S	.l.	HD 4000	Mesa	MacO	S X
GL ARB vertex attrib binding	V	V	V	V	V	Χ	Χ	Χ	X	X	X		X	X	X	
GL ARB texture view	V	V	V	V	V	Χ	Χ	Χ	X	X	Х		X	X	X	
GL ARB texture storage multisample	V	V	V	V	V	Χ	Χ	Χ	V	V	V	′	X	X	X	
GL ARB texture query levels	V	V	V	V	V	Χ	Χ	Χ	V	V	V	′	X	X	X	
GL ARB texture buffer range	V	V	V	V	V	Χ	Χ	Χ	V	V	V	′	X	V	X	
GL ARB stencil texturing	V	V	V	V	V	Χ	Χ	Χ	V	V	V	′	Χ	X	Χ	
GL ARB shader storage buffer object	X	Χ	Χ	V	V	Χ	Χ	Χ	V	V	V	'	V	X	X	
GL ARB shader image size	X	Χ	Χ	V	V	Χ	Χ	Χ	V	V	V	′	Χ	Χ	Χ	
GL ARB program interface query	V	V	V	V	V	Χ	Χ	Χ	V	V	V	'	V	X	X	
GL ARB multi draw indirect	X	Χ	Χ	V	V	Χ	Χ	Χ	V	V	V	,	V	X	X	
GL ARB invalidate subdata	V	V	V	V	V	Χ	Χ	Χ	V	V	V	'	Χ	V	X	
GL ARB internalformat query2	V	V	V	V	V	Χ	Χ	Χ	V	V	V	,	Χ	X	X	
GL ARB framebuffer no attachments	V	V	V	V	V	Х	Χ	Χ	V	V	V	,	Χ	Χ	Χ	
GL ARB fragment layer viewport	V	V	V	V	V	Х	Χ	Χ	V	V	V	,	Χ	Χ	Χ	
GL ARB explicit uniform location	V	V	V	V	V	Χ	Х	Χ	V	V	V	'	X	Χ	Х	
GL ARB ES3 compatibility	V	V	V	V	V	Χ	Х	Χ	V	V	V	,	X	V	X	
GL KHR debug	V	V	V	V	V	Χ	Х	Χ	V	V	V	'	X	X	Х	
GL ARB copy image	V	V	٧	٧	V	Х	Χ	X	V	V	٧	•	X	X	X	

GL ARB compute shader	X	X	X	V	V	X	X	Χ	V	V	V	V	X	X	
GL ARB clear buffer object	V	V	V	V	V		X	X	V	V	V	X	X	X	
GL ARB arrays of arrays	V	V	V	V	V		X	X	V	V	V	V	X	X	
Support	81%	81%	81%	100%	100%	0%	0%	0%	S	90%	90%	90%	24%	14%	0%
														•	
OpenGL 4.2	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Everg	reen Cayı	man S.I.	. HD 4000	Mesa	MacOS X	
GL ARB transform feedback instanced	X	Χ	Χ	V	V		V	V	٧	V	V	V	V	X	
GL ARB texture compression bptc	X	Χ	Χ	V	V	X	X	Χ	V	V	V	V	X	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	V	V	X	
GL ARB shading language 420pack	V	V	V	V	V	V	V	V	V	V	V	V	X	X	
GL ARB shader image load store	X	Χ	X	V	V	X :	Χ	Χ	V	V	V	V	X	Х	
GL ARB shader atomic counters	X	Χ	Χ	V	V	X :	X	Χ	V	V	V	V	X	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	<u>e</u> V	V	V	V	V	V	V	V	V	V	V	V	X	X	
GL ARB base instance	X	Χ	Χ	V	V	Χ .	Χ	Χ	V	V	V	V	V	X	
Support	58%	58%	58%	100%	100%	67%	67%	67%	,	100%	100% 10	00%	100%	58%	0%
OpenGL 4.1	G80	Tesla	GT21X							reen Cayı				MacOS X	
GL ARB viewport array	V	V	V	V		•	V	V	V	V	V	V	X	X	
GL ARB vertex attrib 64bit	X	Χ	X	V	V		X	Χ	V	V	V	V	X	X	
GL ARB shader precision	X	Χ	X	V	•		V	V	V	V	V	V	X	X	
GL ARB separate shader objects	V	V	V	V	V		V	V	V	V	V	V	X	V	
GL ARB get program binary	V	V	V	V	V		V	V	V	V	V	V	V	X	
GL ARB ES2 compatibility	V	V	V	V	V	•	V	V	V	V	V	V	V	X	
Support	67%	67%	67%	100%	100%	83%	83%	83%	ó	100%	100% 10	00%	100%	33% 1	.7%
	000		070			D.C.C.	D) (C=0	D) /=00							
OpenGL 4.0	G80	Tesla	GT21X				RV670				man S.I.			MacOS X	
GL ARB transform feedback3	X	X	X	V	V	•	V	V	V	V	V	V	V	X	
GL ARB transform feedback2	X	V	V	V	V	•	V	V	V	V	V	V	V	X	
GL ARB texture query lod	X	X	V	V	V	X .	X	V	V	V	V	V	V	X	

GL ARB texture gather	Χ	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	V	V	V	V	V	X
GL ARB texture buffer object rgb32	Χ	Χ	X	V	V	V	V	V	V	V	V	V	V	X
GL ARB tessellation shader	Χ	Χ	Χ	V	V	Χ	Х	Х	V	V	V	V	X	X
GL ARB shader subroutine	Χ	Χ	Χ	V	V	X	Χ	Χ	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	X	V	V	Χ	Χ	Χ	V	V	V	V	X	X
GL ARB gpu shader fp64	Χ	Χ	Χ	V	V	X	Χ	Χ	V	V	V	V	X	X
GL ARB draw indirect	Χ	Χ	X	V	V	Χ	Χ	Χ	V	V	V	V	X	X
GL ARB draw buffers blend	Χ	Χ	V	V	V	V	V	V	V	V	V	V	V	X
Support	0%	8%	46%	100%	100%	31%	54%	62%	100%	100%	100%	100	% 4	6% 0%
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	٧	V	V	V	٧	V	V	V	V	V	V	V	X
GL ARB timer query	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB texture swizzle	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB texture rgb10 a2ui	V	V	V	V	V	V	V	V	V	V	V	V	V	X
GL ARB shader bit encoding	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB sampler objects	V	V	V	V	V	V	V	V	V	V	V	V	V	X
GL ARB occlusion query2	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB instanced arrays	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB explicit attrib location	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB blend func extended	V	V	V	V	V	٧	V	V	V	V	V	V	V	X
Support	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100	% 10	00% 60%
													•	
OpenGL 3.2	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS X
GL ARB vertex array bgra	V	٧	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB texture multisample	V	٧	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB sync	V	٧	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB seamless cube map	V	٧	V	V	V	٧	V	V	V	V	V	V	V	V
GL ARB provoking vertex	V	V	V	V	V	٧	V	V	V	V	V	V	V	V
GL ARB geometry shader4	V	V	V	V	V	٧	V	V	V	V	V	V	X	V
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 draw elements base vertex	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Support	100%	6 100%	100%	100%	100%	100%	100%	100%	100%	6 100%	6 100%	100%	89	% 100%
						2000			_					
OpenGL 3.1	G80	Tesla							Evergreen			HD 4000	Mesa	MacOS X
GL ARB uniform buffer object	V	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	V
GL ARB texture rectangle	V	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	V	V
GL NV primitive restart	V	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%	6 100%	100%	100%	100%	100%	100%	100%	100%	6 100%	6 100%	5 100%	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	V	V	V	V	V	V	V	V	V	V	V	V	V
GL EXT transform feedback	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB texture rg	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL EXT texture shared exponent	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL EXT texture integer	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB texture float	V	V	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	V	V	V
GL ARB half float vertex	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB half float pixel	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL EXT gpu shader4	V	V	V	V	V	V	V	V	V	V	V	V	V	V
GL ARB framebuffer sRGB	V	V	V	V	V	V	V	V	V	V	V	V	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	V	V	V

GL ARB color buffer float	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%	1009	6	100%	100%
0 0134	600	- 1	CT24V		1/	D.C.O.O.	D) /670	D) /700	_	-	C 1	LID 4000	D 4	N	C \
OpenGL 2.1	G80	Tesla	GIZIX	Fermi	Kepler	K600	KV6/U	KV/00	Evergreen	Cayman	5.1.	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	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1009	6	100%	100%
														•	
OpenGL 2.0	G80	Tesla	GT21X	Fermi	Kepler	R600	RV670	RV700	Evergreen	Cayman	S.I.	HD 4000	Mesa	MacOS	S X
GL ARB vertex shader	V	V	V	V	V	V	V	V	V	V	٧	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	٧	V	V	V	V	V	V	V	V	V	V	V	V	
GL ARB shader objects	V	٧	V	V	V	V	V	V	V	V	V	V	V	V	
GL ARB point sprite	V	٧	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	
GL ARB draw buffers	V	V	V	V	V	V	V	V	V	V	V	V	V	V	
GL EXT blend equation separate	V	V	V	V	V	V	V	V	٧	V	V	V	V	V	
Support	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1009	6	100%	100%