

# ***OpenGL ES 1.1 lite***

## ***Specification***

### ***Notice***

*Ver. 1.4.1 /October 4,2007*  
*LF1000*

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# 1. Overview

This document is for explaining the specification of OpenGL ES 1.1 Lite using 3D core of LF1000.

## 1.1. Reference Standards

OpenGL ES 1.1 Lite follows the standards of OpenGL ES 1.1 as long as specifically mentioned otherwise.

- [http://www.khronos.org/opengles/1\\_X/](http://www.khronos.org/opengles/1_X/)
- OpenGL ES 1.1 specification  
[http://www.khronos.org/cgi-bin/fetch/fetch.cgi?opengles\\_spec\\_1\\_1](http://www.khronos.org/cgi-bin/fetch/fetch.cgi?opengles_spec_1_1)
- OpenGL ES 1.1 API reference  
[http://www.khronos.org/opengles/documentation/opengles1\\_1/gl\\_egl\\_ref\\_1\\_1\\_20041110/index.html](http://www.khronos.org/opengles/documentation/opengles1_1/gl_egl_ref_1_1_20041110/index.html)


## 1.2. History

Rev. Date	Modifier	Contents
2006/09/09	Gamza	first description
2006/09/20	Gamza	Multi-texture not supported.
2006/11/29	Yuni	H/W buffer object revised.
2006/12/28	Yuni	Light, Material restriction revised.
2007/01/26	Gamza	Modification for LF1000
2007/03/16	Gamza	Use the name of 'OpenGL ES 1.1 lite'
2007/08/02	Gamza	glPointParameter function is not supported function
2007/09/11	Yuni	glTexEnv (GL_TEXTURE_ENV_COLOR) has a restriction.
2007/10/04	Yuni	Add the restrictions about glTexEnv and glFog.
2007/10/18	Yuni	Modify the supported light number
2008/05/26	Yuni	Some functions additionally supported.

## 2. Specification

### 2.1. Capability

Name	Value
GL_MAX_TEXTURE_UNITS	2
GL_MAX_CLIP_PLANES	0
GL_MAX_PALETTE_MATRICES_OES	64+
GL_MAX_VERTEX_UNITS_OES	4+
GL_MAX_ELEMENTS_INDICES	65535
GL_MAX_ELEMENTS_VERTICES	65535
GL_MAX_MODELVIEW_STACK_DEPTH	16+
GL_MAX_PROJECTION_STACK_DEPTH	2+
GL_MAX_TEXTURE_STACK_DEPTH	2+
GL_MAX_TEXTURE_SIZE	512
GL_MAX_LIGHTS	8
GL_COMPRESSED_TEXTURE_FORMATS	GL_PALETTE4_R5_G6_B5_OES GL_PALETTE4_RGBA4_OES GL_PALETTE4_RGB5_A1_OES GL_PALETTE8_R5_G6_B5_OES GL_PALETTE8_RGBA4_OES GL_PALETTE8_RGB5_A1_OES
GL_SMOOTH_LINE_WIDTH_RANGE	1~1024
GL_SMOOTH_POINT_SIZE_RANGE	0 (smooth point is not supported)
GL_ALIASED_LINE_WIDTH_RANGE	1~1024
GL_ALIASED_POINT_SIZE_RANGE	1~1024

 The symbol '+' means that it's not hardware restrictions, and it could be increased by upgrading of the OpenGL ES 1.1 lite library.

## 2.2. Not supported functions

Function group	Function name
User clip plane	glClipPlane
	glGetClipPlane
Stencil buffer	glClearStencil
	glStencilFunc
	glStencilMask
	glStencilOp
Multi sampling	glSampleCoverage
Logical operation	glLogicOp
Color mask	glColorMask

### 2.3. Difference form OpenGL|ES v1.1

Name	Description
glClear	GL_STENCIL_BUFFER_BIT is not allowed.
glEnable glDisable	<p>The following attributes are not allowed.</p> <ul style="list-style-type: none"> <li>● GL_STENCIL_TEST</li> <li>● GL_CLIP_PLANE<sub>n</sub></li> <li>● GL_COLOR_LOGIC_OP</li> <li>● GL_MULTISAMPLE</li> <li>● GL_SAMPLE_ALPHA_TO_COVERAGE</li> <li>● GL_SAMPLE_ALPHA_TO_ONE</li> <li>● GL_SAMPLE_COVERAGE</li> </ul>
glMultiTexCoord	r and q parameters are ignored.
glTexParameter	<p>GL_TEXTURE_MIN_FILTER allows as following attribute under the perspective projection mode(using glFrustum).</p> <ul style="list-style-type: none"> <li>● GL_NEAREST_MIPMAP_NEAREST</li> </ul> <p>GL_TEXTURE_MIN_FILTER doesn't allow the following attributes.</p> <ul style="list-style-type: none"> <li>● GL_LINEAR</li> <li>● GL_LINEAR_MIPMAP_NEAREST</li> <li>● GL_NEAREST_MIPMAP_LINEAR</li> <li>● GL_LINEAR_MIPMAP_LINEAR</li> </ul>
glTexImage2D glTexSubImage2D glCopyTexImage2D glCopyTexSubImage2D glCompressedTexImage2D glCompressedTexSubImage2D	<p>The level is possible from 0 to <math>\log_2[\min(\text{TexWidth}_{base}, \text{TexHeight}_{base})]</math>.</p> <p>If you use the texture mipmap, the permissible texture size has a following restriction additionally.</p> $256 \geq [\min(\text{TexWidth}_{base}, \text{TexHeight}_{base})]$
glTexEnv	<p>In GL_TEXTURE_ENV_MODE, we support GL_REPLACE, GL_MODULATE, GL_DECAL, or GL_ADD perfectly. But there are some restrictions in GL_BLEND and GL_COMBINE mode.</p> <p>See the Table1 and Table2 about the restrictions.</p>
glFog	If the camera mode is a parallel projection (using glOrtho), the fog effect is not applied.

SRC <sub>n</sub> _RGB	OPERAND <sub>n</sub> _RGB	TEXTURE0			TEXTURE1		
		Arg0	Arg1	Arg2	Arg0	Arg1	Arg2
TEXTURE	SRC_COLOR	0	0	0	0	0	0
	ONE_MINUS_SRC_COLOR	0	0	0	0	0	0
	SRC_ALPHA	0	0	0	0	0	0
	ONE_MINUS_SRC_ALPHA	0	0	0	0	0	0
CONSTANT	SRC_COLOR	0	0	0	△	△	△
	ONE_MINUS_SRC_COLOR	0	0	0	△	△	△
	SRC_ALPHA	0	0	0	△	△	△
	ONE_MINUS_SRC_ALPHA	0	0	0	△	△	△
PRIMARY_COLOR	SRC_COLOR	0	0	X	0	0	X
	ONE_MINUS_SRC_COLOR	0	0	X	0	0	X
	SRC_ALPHA	0	0	X	0	0	X
	ONE_MINUS_SRC_ALPHA	0	0	X	0	0	X
PREVIOUS	SRC_COLOR	0	0	X	0	0	X
	ONE_MINUS_SRC_COLOR	0	0	X	X	X	X
	SRC_ALPHA	0	0	X	0	0	X
	ONE_MINUS_SRC_ALPHA	0	0	X	X	X	X

Table 1. Restriction of the arguments for COMBINE\_RGB functions



SRC <sub>n</sub> _ALPHA	OPERAND <sub>n</sub> _ALPHA	TEXTURE0			TEXTURE1		
		Arg0	Arg1	Arg2	Arg0	Arg1	Arg2
TEXTURE	SRC_ALPHA	O	O	O	O	O	O
	ONE_MINUS_SRC_ALPHA	O	O	O	O	O	O
CONSTANT	SRC_ALPHA	O	O	O	△	△	△
	ONE_MINUS_SRC_ALPHA	O	O	O	△	△	△
PRIMARY_COLOR	SRC_ALPHA	O	O	O	O	O	O
	ONE_MINUS_SRC_ALPHA	O	O	O	O	O	O
PREVIOUS	SRC_ALPHA	O	O	O	O	O	O
	ONE_MINUS_SRC_ALPHA	O	O	O	X	X	X

Table 2. Restriction of the arguments for COMBINE\_ALPHA functions

O : Supported.  
X : Not supported.  
△: Partially supported. You can only use the GL\_CONSTANT arguments of GL\_TEXTURE1, when GL\_TEXTURE0 is disabled.