
Introduction

1. INTRODUCTION

1.1 Scope of Document

This manual provides technical discussion of the CL-GD546X family of VisualMedia™ accelerators. This manual includes a detailed architectural and functional description, descriptions of each major component integrated into the device, detailed information on each register, and appendices intended to assist hardware designers.

1.2 Device Types Covered

This manual documents the CL-GD5462 Revision 'AD' and newer, and all revisions of the CL-GD5464.

1.3 Intended Audience

This manual is intended for a technically sophisticated audience. It is assumed that the reader is familiar with assembly language programming on the 8088/8086, 80286/80386/80486, Pentium®, or similar microprocessor, and understands the fundamentals of video display technology.

Hardware engineers should find [Appendix D1, "Data Book"](#) useful. It contains the pin diagram, detailed pin descriptions, and detailed DC and AC characteristics. All registers are described to the bit level in Chapters 3—10. In addition, the application notes in Appendix B1, B2, and B3 are helpful for board designs. Appendix B1 contains information regarding V-Port channel layout that helps in designing a board using the CL-GD546X.

Software engineers should find the *Laguna VisualMedia™ Accelerators Family — CL-GD546X Volume II (Software Reference Manual, Second Edition, September 1996)*, useful for programming examples, BIOS, and driver-level codes.

1.4 Conventions

This section lists the abbreviations and acronyms used in this manual.

Table 1-1. Abbreviations

Symbol	Units of measure
°C	degree Celsius
Hz	hertz (cycles per second)
Kbyte	kilobyte (1,024 bytes)
kHz	kilohertz
kΩ	kilohm
Mbyte	megabyte (1,048,576 bytes)
MHz	megahertz (1,000 kilohertz)
μF	microfarad
μs	microsecond (1,000 nanoseconds)
mA	milliampere
ms	millisecond (1,000 microseconds)
ns	nanosecond
pV	picovolt

The use of 'tbd' indicates values that are 'to be determined'. 'n/a' designates 'not available', and 'n/c' indicates a pin that is a 'no connect'. 'C' lexical conventions (specifically, '^' for exclusive-OR) are also used in this manual.

Table 1-2. Acronyms

Acronym	Definition
AC	alternating current
ALU	arithmetic logic unit
AN	alphanumeric
APA	all points addressable
ATE	automatic test equipment
BIOS	basic input/output system
BitBLT	bit boundary block transfer
bpp	bits-per-pixel
CAD	computer-aided design
CAS	column address strobe

Table 1-2. Acronyms *(cont.)*

Acronym	Definition <i>(cont.)</i>
CLUT	color lookup table
CMOS	complementary metal-oxide semiconductor
CRT	cathode ray tube
DAC	digital-to-analog converter
DC	direct current
DDA	digital differential algorithm
DDC	display data channel
DPMS	display power management signaling
DRAM	dynamic random-access memory
dword	doubleword
EDID	extended display identification
EPROM	electrically programmable read-only memory
EVAFC	extended VESA [®] advanced feature connector
FIFO	first in/first out
GPIO	general-purpose IO
GSC	graphics system controller
GUI	graphical user interface
HRQ	host read queue
HSYNC/VSNC	horizontal/vertical synchronization
HWQ	host write queue
IC	integrated circuit
I/O	input/output
LBI	local bus interface
LSB	least-significant bit
LUT	lookup table
MA	memory arbiter
MC	memory controller
MCC	monochrome-to-color converter
MD	memory data
MMIO	memory-mapped I/O
MSB	most-significant bit

Table 1-2. Acronyms *(cont.)*

Acronym	Definition <i>(cont.)</i>
OFU	operand fetch unit
OSU	operand storage unit
PCI	peripheral component interconnect
PFS	programmable frequency synthesizer
PLL	phase-locked loop
PQFP	plastic quad-flat pack
RAC	Rambus [®] access channel Rambus [®] ASIC cell
RAM	random-access memory
RDRAM	Rambus [®] dynamic random-access memory
RFI	radio frequency interference
RGB	red, green, and blue
RIF	Rambus [®] interface
ROPs	raster operations
RSU	result storage unit
R/W	read/write
SC	serial clock
SRAM	static random-access memory
TLUT	texture lookup table
TSR	terminate and stay resident
TTL	transistor-transistor logic
VDD	virtual device driver
VESA [®]	Video Electronics Standards Association
VGA	video graphics array
VL	VESA [®] local
VRAM	video random-access memory
WE	transparency write enable

1.4.1 Numeric Naming

Hexadecimal numbers are represented with all letters in uppercase and a lowercase 'h' is appended to them (for example, '14h', '3A7h', and 'C000h' are hexadecimal numbers). Hexadecimal numbers may also be represented by prefixing them with '0x', the C coding convention. Binary numbers have a lowercase 'b' appended to them (for example, '01010100b', '01000011b'). Numbers not indicated by an 'h' or 'b' are decimal.

