ADVANCE INFORMATION

DISTINCTIVE CHARACTERISTICS

- Combination Look-up table and triple eight-bit Video DAC
- 16-bit Pixel port displays high resolutions with more colors
- 8-bit Pixel port supports all pixel formats at a reduced bandwidth
- 256 x 24-bit palette supports 256 out of 256K or 16M colors
- 15-, 16-, and 24-bit Direct-color modes for display of 32K, 64K, or 16M colors
- 32-bit pixel format for 24-bit Direct-color with 255 overlays
- Pinout is backward-compatible with previous generation of Graphics Color Palettes
- Internal Clock-synchronization PLL generates dot clock for 2:1 and 2:3 muxing modes, allowing easy pixel bus interface
- Format-shift dynamically mixes Pseudo- and Direct-color pixels
- Format-shift controlled by SHIFT pin or by d15 of 15-bit format

- True little-endian and big-endian data transfer formats
- Directly drives double-terminated 75-ohm transmission line
- Compatible with VGA, Super-VGA, VESA, TIGA™, and 8514/A with enhanced features
- Two power-down modes for extended battery life
- Internal/external voltage reference for DACs
- Programmable setup control
- Monitor Sense comparators to detect monitor connections
- Pixel Replicate™ prevents display noise caused by Look-up table or Mask register access during active display time
- 44-pin PLDCC and 44-pin PQFP packages
- 90-, 110-, 125-, and 142-MHz clock rates
- High-performance, TTL-compatible CMOS for low power
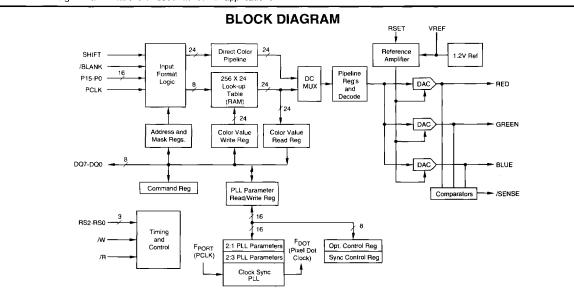
GENERAL DESCRIPTION

The WidePort Graphics Color Palette combines a high-bandwidth, 16-bit Pixel port with three eight-bit Video DACs, and a 256-word by 24-bit Look-up table. Many pixel formats are supported including eight-bit pseudo-color and 15-, 16-, and 24-bit direct-color as well as a 32-bit format that allows 24-bit direct-color with 255 overlay colors. The Format-shift feature supports switching between Direct-color and Pseudo-color formats on a pixel-by-pixel basis. This feature is controlled by either the SHIFT pin or optionally d15 of the 15-bit Direct-color format.

Pixel data is clocked into the device up to sixteen bits at a time. In this mode of operation, 8-, 15/16-, 24-, and 32-bit pixel formats are available, yielding 2:1, 2:2, 2:3, or 2:4 relationships, respectively, between the input data width and the pixel format width. The pixel port may also be used in a VGA-compatible eight-bit mode, yielding 1:1, 1:2, 1:3, and 1:4 muxing ratios. Input data ordering is programmable in all modes, supporting both little-endian, VGA-based graphics controllers as well as big-endian controllers used in other applications.
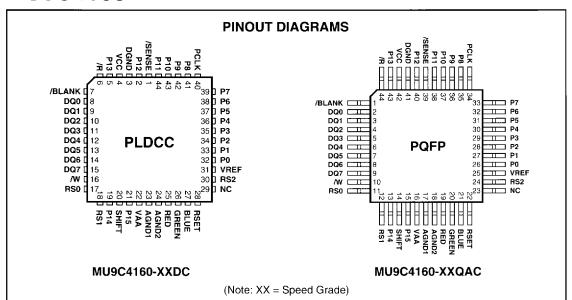
Synchronization circuitry is included for handling pixel-port–to–pixel-clock rate conversions. The device synchronizes external pixel data to the internally generated pixel dot clock. An internal PLL generates the dot clock for the 2:1 and 2:3 muxing modes, where the dot clock cannot be derived by a simple division of the Pixel Port clock.

The asynchronous host interface provides access to the standard VGA registers and Look-up table. Enhanced features and modes are enabled via extended registers. All registers are accessible through the standard VGA DAC addresses. Optionally, RS2 may also be used.

Monitor Sense comparators, power down modes, and Pixel Replicate™ functionality facilitate the system application of this device. Available in 44-pin PLDCC and 44-pin PQFP packages, this device supports the screen resolution, color capability, and power requirements necessary for high-performance desktop and notebook personal computers, workstations, and desktop publishing systems.

BLOCK DIAGRAM

January 7, 1994, Rev. 0

MU9C4160

PINOUT DIAGRAMS

PLDCC

MU9C4160-XXDC

PQFP

MU9C4160-XXQAC

(Note: XX = Speed Grade)

Supported Muxing Ratios

Pixel Port Width	Bits per Pixel	Mux Ratio	Typical Resolutions
8	8	1:1	1280 x 1024 x 256 colors
8	15/16	1:2	1024 x 768 x 32K/64K colors
8	24	1:3	800 x 600 x 16M colors
8	32	1:4	640 x 480 x 16M colors with overlays
16	8	2:1	1280 x 1024 x 256 colors
16	15/16	2:2	1280 x 1024 x 32K/64K colors
16	24	2:3	1024 x 768 x 16M colors
16	32	2:4	1024 x 768 x 16M colors with overlays

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