LCD VGA

## Rainbow Family

The OPTi92C168 and the 92C178 are the first two members of the Rainbow family of true color LCD VGA controllers. They offer a low power, high performance, complete panel support with minimum chip count LCD VGA graphic solutions for portable IBM compatible personal computers.

The 92C168 requires no external component other than the display memory and a 14.3MHz reference clock to complete a VGA sub-system. The 92C168 can directly interface to the 32-bit VESA local bus, PCI bus and 16-bit ISA bus. It can drive a variety of panels directly without any external buffers. It is designed to be the ideal choice for highly integrated systems.

The 92C168 supports a wide variety of dual scan color/mono STN, single scan color/mono STN and TFT panel. It supports panel with 640x480 and 1024x768 resolution. For color panel, it supports up to 16.8 million colors. For monochrome panel, it supports up to 256 gray shades.

The 92C168 supports simultaneous display of CRT and LCD. It supports up to 1280x1024 256 colors on CRT display. The hardware cursor bring desktop type performance to the notebook PC arena.

The 92C168 is optimized for minimum power consumption during normal operation and three level of power saving modes. It supports 3.3V/5V mixed voltage to further lower the system power consumption.

The 92C178 is a pin-compatible upgrade to the 92C168, which includes GUI functionality and an integrated dual clock synthesizer.

The 92C168 is 100% hardware and BIOS compatible with IBM VGA standard. OPTi supplies fully VGA/VESA compatible BIOS, drivers for all of the common applications, and OEM/end-user utilities software.

Features and Benefits:

- 100% hardware/BIOS compatible with IBM VGA standard.
- Integrated true color RAMDAC and dual-frequency Synthesizer*.
- Flexible DRAM configurations:
  - One/two/four*256Kx16 DRAMs
  - Four/eight/sixteen* 256Kx4 DRAMs
- Support simultaneous display with one 256Kx16 DRAM.
- Hardware cursor up to 64 x 64 pixels.
- Hardware pop-up icon up to 128x128 pixels.
- High performance write buffer architecture.
- 32-bit direct interface with VESA local bus.
- Direct interface with dual scan color/mono STN, single scan color/mono STN, and TFT panels.
- Supports up to 16.8 million colors on both CRT and LCD display.
- Supports up 256 gray shades for monochrome LCD.
- Programmable linear addressing.
- Text mode contrast enhancement on LCD display.
- Text and graphic modes reverse video on LCD display.
- Vertical expansion and auto centering screen adjustment on LCD display.
- Advance power management to optimize the power consumption during normal operation and power down modes.
- Power sequencing control outputs to regulate the power supplies for panel and backlight.
- 3.3V/5V mixed voltage operation.
- Low power, high speed 0.8 µ CMOS technology.
- Pin-to-pin compatible between 92C168 and 92C178.
- 208 pin QFP package.

92C178 Enhancements:
- Enhanced BLT engine for GUI acceleration*
- Integrated dual clock synthesizer
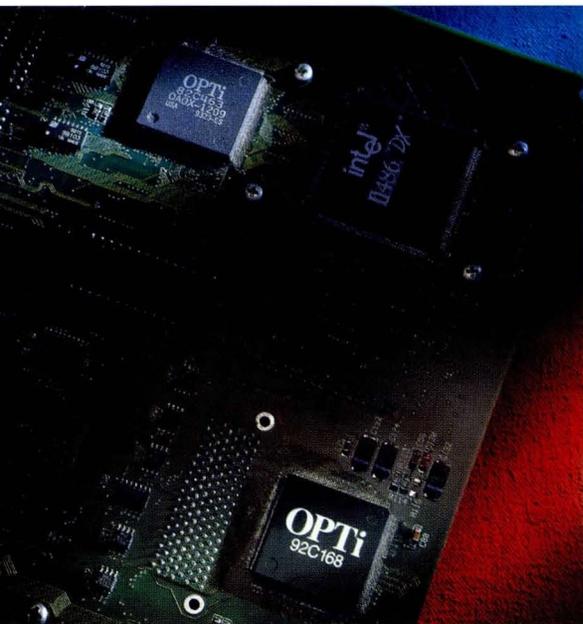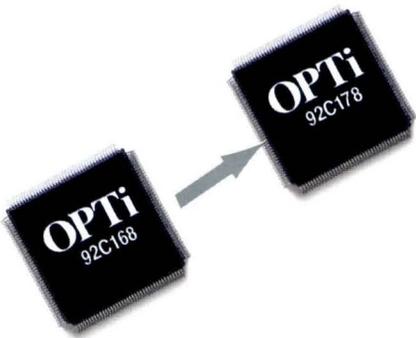
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T he OPTi 92C168 and the 92C178 are a highly integrated single chip LCD super VGA controllers. The 208 pin QFP devices provide single chip solutions including RAMDAC, dual clock synthesizer, direct VESA local bus interface, direct panel interface, and power management functions. The OPTi92C168 supports 3.3v/5.0v mixed voltage operation with the power management implementation flexibility of SMI. The OPTi92C168 offers OEMs the tool for superior product in the notebook VGA market.

Display Memory

System Bus (ISA or VESA Local Bus)

OPTi 92C168/ 92C178

CRT Display

LCD Display

14.318 MHz
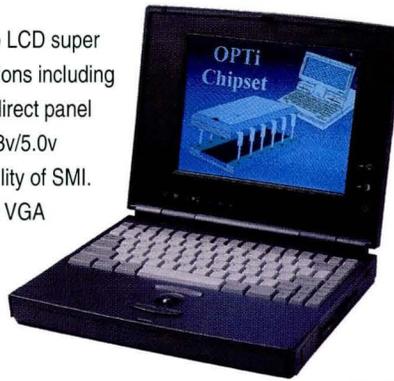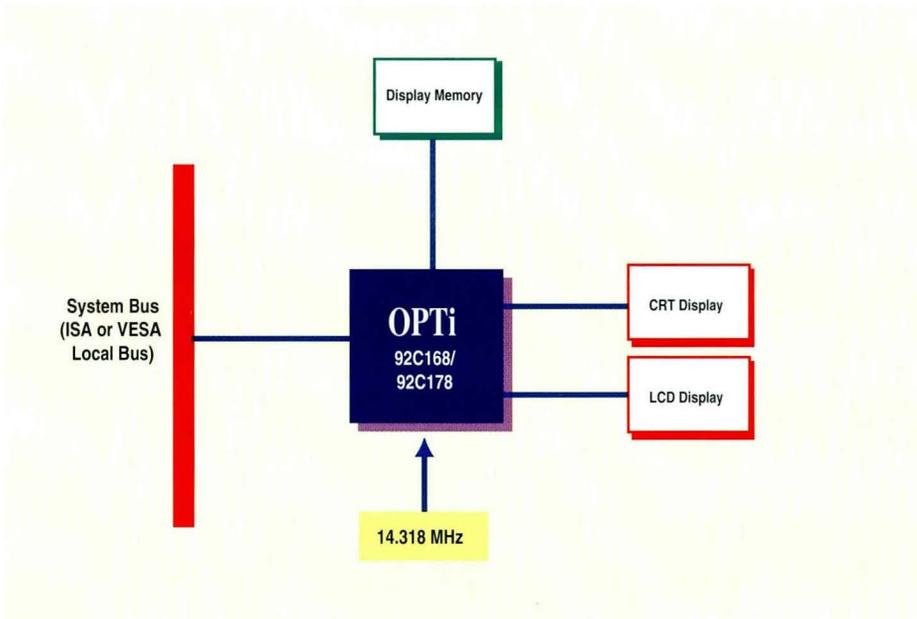
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