
1.1 INTRODUCTION

Welcome to use the Green G486VLI motherboard. The Green G486VLI is the leading motherboard for ISA and VESA 486 performance. The motherboard uses the most advanced third generation single PC chipset, and supports VESA Local Bus technology, Intel's NEW Pentium P24T processor, and EPA ENERGY STAR performance. All the capabilities of Green G486VLI motherboard ensure your systems high performance expectations. The Green G486VLI is 100% compatible with IBM PC/AT, and also is 100% software compatible.

EPA Energy Star Performance

The Green G486VLI provides the current Green PC technology, conforming to Phase II of the EPA's Energy Star guidelines. The Green G486VLI goes beyond the first phase of system power reduction of sleep signal to the power supply, CPU clock speed reduction, and Hard Drive sleep mode. The Green Star includes the Phase II guidelines by incorporating monitor sleep mode capabilities to work with upcoming Green Monitors by signaling the power down mode through the motherboard signal to power supply.

Vesa Local Bus

The G486VLI is fully VESA Local bus compatible, designed according to the VESA committee's local bus engineering standards. It is fully compatible across a wide range of local bus cards.

Cutting Edge Design Technology

The G486VLI utilizes not only the complete line of Intel' 486SX, 486DX and 486DX2 processors with speeds up to 66MHz, but also AMD's and CYRIX's newly released 486 CPUs. Incorporating support for up to 128MB of DRAM and up to 1MB of external cache, this motherboard allows the user to integrate a system with high performance in the most complicated applications. To ensure that your system is applicable for tomorrow's applications, our R&D engineers have implemented the most up-to-date EPA Energy Star requirements and provided maximum expandability and flexibility with the motherboard. In a word, it is ultimately committed to make sure you, our customers, stay with the cutting edge of the latest technology as it developed.

Highest Reliability

Our QA engineers assure the highest engineering and reliability standards. All our products are designed according to requirements from various agencies, such as FCC, UL, CSA, etc. and manufacture through strict QA procedures which include all the functionality testing and 24 hour dynamic Burn-in process.

Processor

- Full line of Intel 80486
- Intel Overdrive
- Intel Pentium P24T
- Full line of AMD 80486
- Full line of Cyrix 80486

Clock Speed

- Jumper Selection CPU Frequencies
- 486DX-33,40,50 MHz
- 486SX-20,25,33 MHz
- 486DX2-50,66 MHz

Energy Efficiency Features

- EPA Phase II Energy Star Performance
- Sleep Signal to Green Power Supply
- CPU Clock Speed Reduction
- Hard Drive Sleep Mode
- Monitor Sleep Mode

Main Memory

- Supports 30 Pin SIMM x 8 (1/4/16MB)
- Supports 72 Pin SIMM x2 (4/8/16MB)
- Maximum 128 MB On Board

Cache Memory

- 0, 256K, 512K, 1MB External Cache

Form Factor

- 3/4 Baby AT Footprint
- 220mm W x 285mm L
- 4 Layer PCB

BIOS

- AMI 486 BIOS
- Standard and Advanced setup
- Hard Drive Detect and Configuration
- Boot Sector Virus protection
- Memory Size Detect
- EGA/VGA Shadow
- Flash BIOS (Optional)

Slots

- 7x16-bit ISA Slots
- 3 VESA Local Bus Slots (occupying 3 ISA Slots)
- 2 VL Slots support Bus Mastering

Connectors

- Standard AT Style 5 PIN DIN Keyboard Connector

Additional Features

- Turbo Switch Support
- Clock Generator On Board
- Clock / Calendar
- Hardware reset
- Power Down Indicator Support
- Power Down Hardware Switch

Chipset

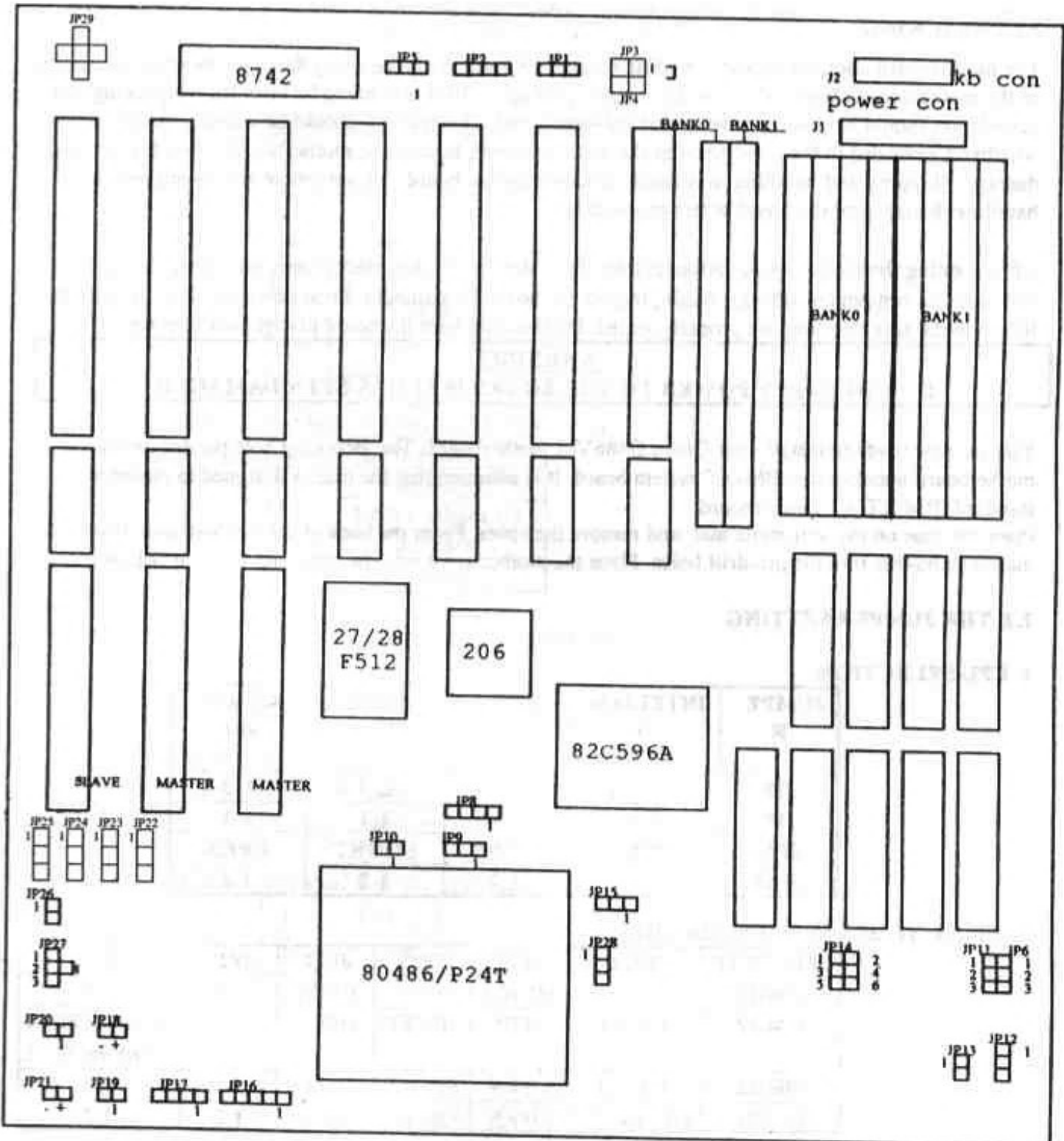
- Contaq 82C 596A

Documentation

- Complete Installation and User Manual

1.3 SYSTEM FEATURES

- 80486 based PC/AT compatible motherboard with VL-BUS
- Supports EPA's Energy Star guideline
- Supports 486DX/DX2/SX 20/25/33/50/66/MHz
- Supports 256KB/512KB/1MB of external cache operating in BURST mode
- Write-Back direct mapped cache architecture
- 3 VESA local buses (VL-BUS)
- Supports both 30pin and 72pin SIMM modules with the size of 256KB/1MB/4MB/16MB
- Supports up to 128MB of RAM on the motherboard
- Supports the FLASH BIOS(optional)
- Licensed AMI BIOS
- Support shadow RAM for system BIOS & video BIOS
- On board clock generator
- 8042 emulation for fast CPU reset and A20 gate generation
- Fully compatible with MS-DOS, OS/2, XINIX, UNIX and Novell Netware



SECTION 2 HARDWARE INSTALLATION

2.1 UNPACKING

The motherboard contains sensitive electric components which can be easily damaged by static electricity, so the motherboard should be left in its original package until it is ready to be installed. Unpacking and installation should be done on a grounded anti-static mat. The operator should be wearing an anti-static wristband grounded to the same point as the anti-static mat. Inspect the motherboard carton for obvious damage. Shipping and handling may cause damages to your board. Be sure there are no shipping or handling damages on the board before proceeding.

After opening the motherboard carton, extract the system board and place it only on a grounded anti-static mat with the component side up. Again, inspect the board for damages. Press down on all of the sockets IC's to make sure that they are properly seated. Do this only with the board placed on a firm flat surface.

WARNING

DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

You are now ready to install your Green G486VLI motherboard. The mounting hole pattern on the motherboard matches the IBM-XT system board. It is assumed that the case is designed to mount a standard IBM XT/AT motherboard.

Place the case on the anti-static mat, and remove the cover. From the back of the motherboard, insert the plastic stand-offs into the pre-drill holes. Place the motherboard into the case, and fasten it with screws.

2.2 THE JUMPER SETTING

1. CPU SELECTION

JUMPER	INTEL/AMD 486DX	INTEL 486SX	INTEL P24T	CYRIX 486
JP8	1-2, 3-4	2-3	1-2, 3-4	1-2, 3-4
JP9	2-3	OPEN	1-2	2-3
JP10	OPEN	OPEN	SHORT	OPEN
JP15	1-2	1-2	1-2	2-3

2. CPU & VL-BUS SPEED SELECTION

CPU SPEED	JP14	JP13	JP23	JP22	JP27	JP28
25MHZ	1-2	SHORT	OPEN	OPEN	2-4	2-3
33MHZ	1-2, 5-6	OPEN	SHORT	OPEN	2-4	For DX-33CPU 1-2 For DX-66CPU 2-3
40MHZ	1-2, 3-4	OPEN	SHORT	SHORT	1-2	1-2
50MHZ	1-2, 3-4, 5-6	OPEN	SHORT	SHORT	1-2	1-2

3. CACHE SIZE SETTING

JUMPER	256K	512K	1MB
JP12	1-2	2-3	2-3
JP11	1-2	2-3	OPEN
JP6	OPEN	OPEN	2-3

4. GREEN FEATURE HARDWARE SETUP

JP3	OPEN	Green PC power supply connector
JP20	OPEN	Sleep Mode active hardware switch
JP18	1-2	Sleep Mode active LED indicator connector

5. OTHER JUMPER SETUP

JP4 Display Adapter Select Jumper

Open	For color display adapter (EGA/PGA/VGA)
Short	For CGA monitor

JP1 CMOS RAM Data Reset Jumper

1-2	For Normal operation
2-3	To clear CMOS

JP17 Speaker Connector

1	Data
2	n/c (key)
3	Ground
4	+5V

JP16 Keylock & Power LED Connector

1	LED Anode (+)
2	n/c (key)
3	LED Cathode (-)
4	Keylock
5	Ground

JP19 Hardware Turbo Switch Connector

Open	Turbo speed
Short	Normal speed

JP21 Turbo LED Connector

1	Anode (+)
2	Cathode (-)

JP2 External Battery Connector

1	Battery (+)
2	No connection
3	Ground
4	Ground

JP26 Hardware Reset Switch Connector

Open	For normal operation
Short	For hardware reset

J2 Keyboard Connector

1	Keyboard clock
2	Keyboard data
3	No connection
4	Ground
5	+5V (Power)

Refer to the following table to correctly install the CPU, oscillator, and jumper settings:

PKG TYPE	CPU TYPE	JP8	JP9	JP10	JP13	JP14	JP15	JP22	JP23	JP27	JP28
PGA	INTEL 486SX-25	2-3	OPEN	OPEN	SHORT	3-4 5-6	1-2	OPEN	OPEN	2-4	2-3
	INTEL 486SX-33	2-3 3-4	OPEN	OPEN	OPEN	5-6	1-2	OPEN	SHORT	2-4	2-3
	Intel/Amd 486DX-33	1-2 3-4	2-3	OPEN	OPEN	5-6	1-2	OPEN	SHORT	2-4	2-3
	Amd 486DX-40	1-2 3-4	2-3	OPEN	OPEN	1-2 3-4	1-2	SHORT	SHORT	1-2	1-2
	Intel 486DX2-50	1-2 3-4	2-3	OPEN	SHORT	3-4 5-6	1-2	OPEN	OPEN	2-4	2-3
	Intel 486DX2-66	1-2 3-4	2-3	OPEN	OPEN	5-6	1-2	OPEN	SHORT	2-4	2-3
	INTEL 486DX-50	1-2 3-4	2-3	OPEN	OPEN	1-2	1-2	SHORT	SHORT	1-2	1-2
	INTEL P24T	1-2 3-4	1-2	SHORT	OPEN	***	1-2	***	***	***	***
	CYRIX M6*	2-3	OPEN	OPEN	OPEN	5-6	2-3	OPEN	SHORT	2-4	2-3
	CYRIX M7**	1-2 3-4	2-3	OPEN	OPEN	5-6	2-3	OPEN	SHORT	2-4	2-3
FQFP	INTEL 486SX-25	2-3	OPEN	OPEN	SHORT	3-4 5-6	1-2	OPEN	OPEN	2-4	2-3
	Intel 486SX-33	2-3	OPEN	OPEN	OPEN	5-6	1-2	OPEN	SHORT	2-4	2-3

* Cyrix M6 is compatible with Intel 486SX-33

** Cyrix M7 is compatible with Intel 486DX-33

*** There is no specific specification about the speed of INTEL P24T processor when this mother board is developed, however, user can refer the speed jumper setting of INTEL 486 CPU when INTEL P24T is available to be implemented on this mother board.

WARNING

1. The CPU is a sensitive electronic component, and it can easily be damaged by static electricity. So users must keep it away from metal surface when installing the CPU onto the motherboard.
2. Before installing the CPU, the motherboard must be placed on a flat surface to avoid being broken by pressure of inserting the CPU.
3. When installing the CPU, please notice the PIN 1 of the CPU is the same corner as the PIN 1 of the socket.

2.4 INSTALLING SIMM MODULES

The Green G486VLI motherboard has eight conventional 30-PIN SIMM sockets and two 72-PIN SIMM sockets which are divided into two banks of page mode local memory. Bank 0 must be installed first before bank 1. Each bank requires either 4 SIMM modules for 30-PIN SIMM or 1 SIMM modules for 72-PIN SIMM. The motherboard will accept 256Kx9, 1Mx9, 4Mx9, 16Mx9, 256Kx36, 1Mx36 and 4Mx36 type of SIMM modules. Therefore the total memory size can vary from 1MB to 128MB. Check the pictures below to make sure that the SIMM modules are correctly installed.

BEWARE

1: Only two banks of SIMM modules are supported.

But 30-PIN and 72-PIN modules can be mixed.

You can plug in 72-PIN module on BANK0 (SIM10) and 30-PIN module on BANK1 (SIM1-4) or 30-PIN module on BANK0 (SIM5-8) and 72-PIN module on BANK1 (SIM9).

2: 256KX9, 1MX9, 4MX9, 16MX9 and 256KX36, 1MX36, 4MX36 modules can be mixed.

Be sure the Pin-1 of the SIMM modules matches the Pin-1 position of the SIMM socket. Insert the SIMM module into SIMM socket at a 45 degree angle. If the SIMM module is put in from the wrong direction, it cannot be inserted into the socket completely. Having completely inserted the SIMM module into the socket, push the SIMM module to the vertical position until the left and right clips hold the SIMM module firmly in places.

2.5.1 Cache Memory Size Jumper Setting:

SIZE	JP11	JP12	JP6	BANK 0 U9, U10 U11, U12	BANK 1 U20, U21 U22, U23	TAG RAM U24
256KB	1-2	1-2	OPEN	32Kx8	32Kx8	32Kx8
				64Kx8*	None	32Kx8
512KB	2-3	2-3	OPEN	64Kx8*	64Kx8*	64Kx8*
				128Kx8	None	32Kx8
1MB	OPEN	2-3	2-3	128Kx8	128Kx8	128Kx8

* 64x8 SRAMs are not available at the time of the motherboard developed, however, the motherboard design does include the case of applying 64Kx8 SRAM to it, therefore we suggest users not use 64Kx8 SRAM when it becomes available until the further notice can be provided.

2.5.2 SRAM Chips part number:

Manufacture	8Kx8 SRAM	32Kx8 SRAM
IDT	7164	71256
ISSI	IS61C64A	IS61C256
Motorola	MCM6264BP	MCM6206NP
Performance	P4C164	P4C1256
Toshiba	TC5588P	TC55328P

2.5.3 Chips (S-RAM) Speed Select:

SYSTEM-SPEED	CACHE-RAM SPEED	TAG-RAM SPEED
20MHz	35ns or faster	30ns or faster
25MHz	35ns or faster	30ns or faster
33MHz	25ns or faster	20ns or faster
50MHz	20ns or faster	20ns or faster

2.6 INSTALLING EPROM

There are two types EPROMs which can be implemented on this motherboard. By selecting a various EPROM user can have either FLASH BIOS which can be both read and written, or NONFLASH BIOS which can only be read. Some of EPROMs require 12 volt power supply instead of 5 volt. User can set JP5 to choose either 5 volt or 12 volt power supply depending on various EPROM vendors user has. Be aware that in case of NONFLASH BIOS been chosen, usually the EPROM of 27F512 type is used, and EPROMs of this type are typical 28(14x2) pin DIP ICs. Please make sure that after the IC is inserted into the 32(16x2) pin DIP socket there are 4 pin-hole left unoccupied. Refer the graphics below to make sure that the EPROM has been correctly installed.

2.6.1 EPROM Select:

Type of EPROM	U28
Nonflash	27F512
Flash	28F512

2.6.2 Power supply select for the different EPROM

Type of power supply	JP5
5 volt	1-2
12 volt	2-3