Z86C9300ZEM
ICEBOX™ FAMILY Z8®
IN-CIRCUIT EMULATOR – C93

HARDWARE FEATURES

■ Supported Devices

Package	Emulation	Programming
40-Pin DIP	**Z86C93**	**N/A**
44-Pin PLCC	Z86C93	N/A

■ Real-Time Emulation

■ ICEBOX Emulator Provides In-Circuit Program Debug Emulation

■ Z8 GUI Emulator Software

■ Windows-Based User Interface

■ RS-232 Connector

■ ICE Pod Connector for Emulation

■ HP-16510 Logic Analysis System Interface Connector

GENERAL DESCRIPTION

The Z86C9300ZEM is a member of Zilog's ICEBOX product family of in-circuit emulators providing support for the above listed Z8 microcontroller devices.

Zilog's in-circuit emulators are interactive, Window-oriented development tools, providing a real-time environment for emulation and debugging.

The emulator provides essential timing and I/O circuitry to simplify user emulation of the prototype hardware and software product.

Data entering, and program debugging, are performed by the monitor ROM and the host package, which communicates through RS-232C serial interface. The user program can be downloaded directly from the host computer through the RS-232C connector. User code may be executed through debugging commands in the monitor.

The Z86C9300ZEM emulator can be connected to a serial port (COM1, COM2, COM3, and COM4) of the host computer and uses Graphical User Interface (GUI) software.

SPECIFICATIONS

Operating Conditions
Operating Temperature: 20°C, ±10°C
Supply Voltage: +5.0 VDC, ± 5%
Minimum Emulation Speed: 1 MHz
Maximum Emulation Speed: 16 MHz
Shipped with 12 MHz Crystal

Power Requirements
+5.0 VDC @ 0.5A

Dimensions
Width: 6.25 in. (15.8 cm)
Length: 9.5 in. (24.1 cm)
Height: 2.5 in. (6.35 cm)

Serial Interface
RS-232C @ 9600, 19200 (default), 28800, or 57600 Baud

HOST COMPUTER

Minimum Requirements

    BM PC (or 100-percent compatible) 386-based machine
    33 MHz
    4 MB RAM
    VGA Video Adapter
    Hard Disk Drive (1 MB free space)
    3.5-inch, High-Density (HD) Floppy Disk Drive
    RS-232C COM port
    Mouse or Pointing Device
    Microsoft Windows 3.1

The following changes to the Minimum Requirements are recommended for increased performance:

    486- or Pentium-based machine
    66 MHz (or faster)
    8 MB of RAM (or more)
    SVGA Video Adapter
    Color Monitor
    Printer

KIT CONTENTS

Z86C93 Emulator

•Emulation Base Board includes:
    CMOS Z86C9320PSC
    8K x 8 EPROM (Programmed with Debug Monitor)
    32K x 8 Static RAM
    Three 64K x 4 Static RAM
    RS-232C Interface
    Reset Switch

•Z86C93 Emulation Daughterboard
    20 MHz CMOS Z86C9320VSC Chip
    80-Pin Target Connectors
    Three HP-16510 Logic Analysis System Interface Connectors

Cables/Pods

    Power Cable with Banana Plugs
    Power Cable with 1A Slow-Blow Fuse
    DB25 RS-232C Cable
    44Pin PLCC Emulation Pod Cable
    40-Pin DIP Emulation Pod Cable

Host Software

    Z8® GUI Emulator Software
    ZASM Cross-Assembler/MOBJ Object File Utilities

Documentation

    Emulator User Manual
    Z8 Cross-Assembler User's Guide
    Universal Object File Utilities (MOBJ)
    Registration Card
    Product Information

LIMITATIONS

1. Changing drives in file download and load symbol dialog boxes is not anticipated by the GUI. Typing in the filename in a directory other than shown in "Path:" will result in "File not found". Changing the drive using the mouse is the workaround.

2. The initial blue Zilog screen will be distorted by other active windows. This only affects the appearance, not functionality, of the GUI.

3. Switching ICEBOXes without quitting the GUI is not supported.

4. The maximum symbols that can be loaded is 32768, provided that there is enough system resource (memory).

5. The ICEBOX breakpoint hardware does not distinguish between instruction and data fetches. When a breakpoint in the GUI is set, the breakpoint hardware triggers when the addresses match for either code or data fetches.

    Example:

```
000C      SRP     #%0
000E      LD      R4, #%0016
0010      LD      R5, @R4
0012      NOP
0013      JP      %000C
0016      NOP
```

    Setting the breakpoint at %0016 and click GO.

    Result: The code will break and stop at %0012.

    Note: This will not happen when Animate Mode is on because the GUI is not using the hardware breakpoints when in Animate Mode.

6. If the emulator is running a user code at full speed and the port window is opened: Switching to another application or minimizing the GUI (then restoring) will result in the following ICEBOX Communications Error message: "Emulator rejected command: target program is executing." This message may need to be cleared several times (as many as seven) before the GUI returns to normal operation.

    Workaround: Always close the port window before leaving the GUI.

LIMITATIONS (Continued)

7. Do not put breakpoint at address after Stop instruction. This will cause program counter to continue at that location after a Stop-Mode Recovery.

8. The ICEBOX cannot stop timers during single-step operation, or upon reaching of breakpoint.

PRECAUTION LIST

1. All Z8 control registers are write only unless stated otherwise.

2. Power Supply ramp-up/rise time must be such that when minimum power-on reset time (T_{POR}) expires, then the V_{CC} must be in the supported specified operating range of the device.

3. The ICEBOX cannot stop Timers and Interrupts at a breakpoint or during ICEBOX Halt operation or a single-step operation. The stack will overflow if an interrupt is enabled and the ICEBOX is in HALT, single-step, or breakpoint. (This is a limitation of the ICE chip.)

4. Check the T_{POR} and T_{WDT} specifications of the device that you wish to emulate. The actual specification may differ from the ICE chip specifications.

5. The general-purpose registers after Power-On Reset or at initial emulator use will be different than the actual device. The emulator self test will always leave the same values in the general-purpose registers, while the real device will have a random/undefined value in the general-purpose registers.

6. GUI software versions prior to 3.00 are incompatible with hardware containing BOOTROM 3.00. The GUI software may still boot, but will fail at some later point of the session.

7. The status color bar in OTP dialog box will be cleared in the area where a new window opens on top of it.

8. For 386 PCs, set the baud rate to 19.2K or less because Windows' communication driver does not guarantee "reliable" operation at more than 9600 baud. Selecting a high baud rate on some slower 386 machines may crash the Windows environment.

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