HP Emulators and Development Solutions for NEC V Series Microprocessors
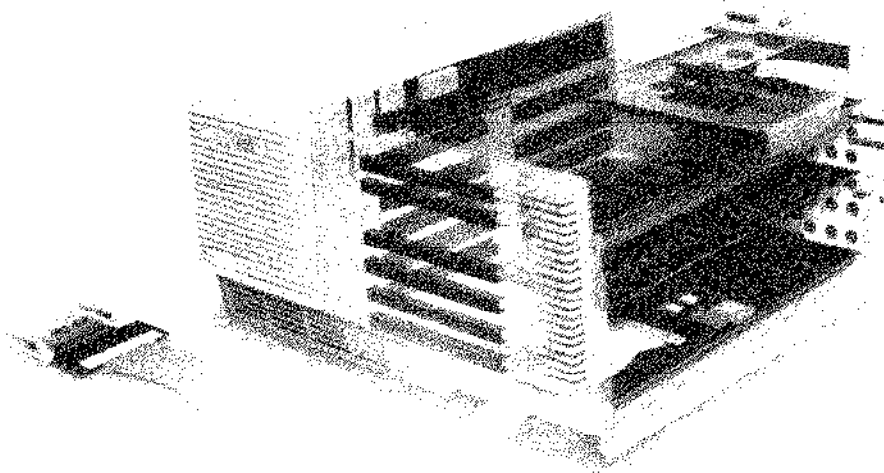
Technical Data

Design, debug, and integrate real-time embedded systems

The HP 64700A card cage is the foundation in configuring a system to meet specific needs. A host computer can communicate with the card cage via LAN, RS-232-C or RS-422, allowing HP development tools to function in a variety of design environments. Active, semiactive, or passive emulation probes support nonintrusive, electrically transparent, easy plug-in to NEC V series microprocessors.

Each HP emulation and analysis system for the NEC V series offers a complete feature set for emulation, emulation bus analysis and emulation memory. These include a Coordinated Measurement Bus for synchronization and cross-triggering up to 32 HP 64700 Series emulators. Powerful sequencing and windowing capability for analyzing multitasking operating systems make HP tools a thorough and viable solution for your NEC V series needs.
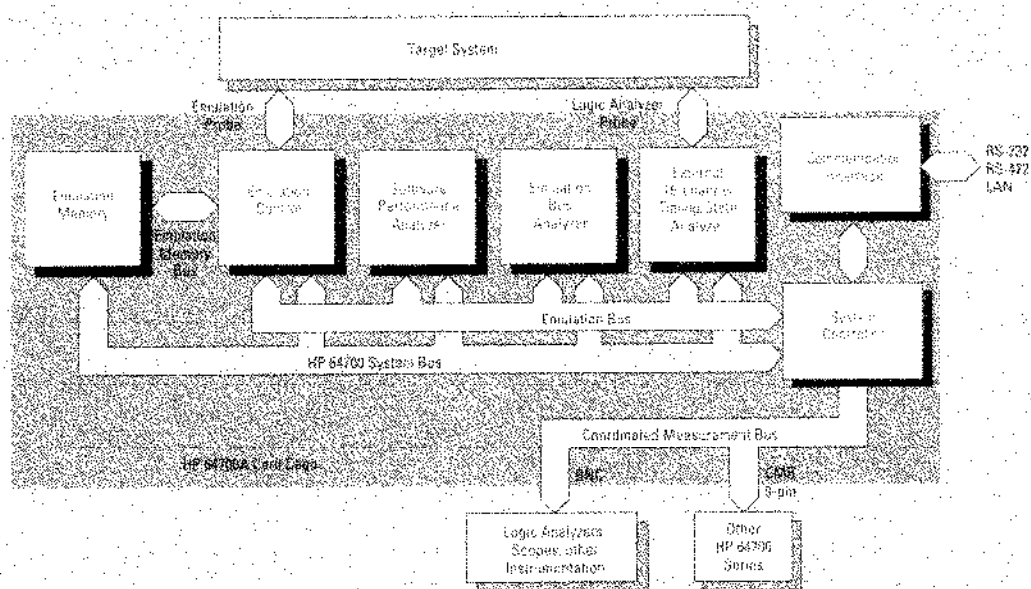
NEC Microprocessor	HP Emulator	Speed	Memory (bytes)
V25	HP 64731	8 MHz	128K or 512K
V25+/V35+	HP 64754/HP 64755	10 MHz	128K or 512K
V33	HP 64756	16 MHz	128K, 512K, or 1 Mbyte
V40	HP 64791	10 MHz	128K, 512K, or 1 Mbyte
V50	HP 64792	10 MHz	128K, 512K, or 1 Mbyte
V53	HP 64757	16 MHz	128K, 512K, or 1 Mbyte
V70	HP 64758	20 MHz	512K or 1 Mbyte

Summary of HP emulators for NEC V series microprocessors.

Hewlett-Packard has an array of solutions for transparent emulation and analysis for the NEC V25, V25+/V35+, V33, V40, V50, V53, and V70 microprocessors. These solutions can be combined in various configurations, allowing a custom fit for every purpose, from problem-solving to rigorous development needs.

HP's host-independent emulation and analysis systems can be controlled from a simple terminal, HP 9000 Series workstations, and IBM PC-compatibles. Access to these systems is via a selection of user interfaces.

Modular HP 64700 Series systems

Emulation and analysis systems can be combined in any number of configurations to meet your design needs. Emulators for the NEC V Series are available for use in the HP 64700A card cage.

HP 64700A card cage

The HP 64700A card cage is the basis for modular HP 64700 series emulators and analyzers. It can be disassembled and reassembled for easy, cost-saving reconfiguration to support other 8, 16, or 32-bit processors.

The card cage has six and a half card slots. Two and a half slots are dedicated to a card cage host control card, an emulation bus analyzer card, and an optional LAN card. The remaining four slots are available for emulator card sets, a Flash EPROM card, an optional software performance analyzer card and any future products. The Flash EPROM card provides easy software and firmware updates.

Your host computer can communicate with the card cage via LAN, RS-232-C, or RS-422, allowing the HP development tools to operate in a wide variety of design environments. The card cage contains two independent RS-232-C serial ports, each with standard 25-pin female connectors. RS-422 capability embedded in one of the ports can be programmed to operate at rates up to 460 Kbaud and is available for the HP 9000 workstations or IBM PC compatibles. A LAN card supports connection to Ethernet networks via ThinLAN, ThickLAN, or StarLAN. TCP/IP protocols, LAN gateways, subnets, and ARPA/Berkeley standards are supported.

Real-time emulation

State-of-the-art probing technology insures nonintrusive, electrical transparency of targeted processors.

Extensive breakpoint capabilities let you define where to start and stop the execution of code. Up to 32 software breakpoints can be set up in the emulators, allowing execution to be halted at an instruction point. Eight real-time hardware breakpoints increase the flexibility and power of this feature, extending functionality to include stopping at processor address, data and status points.

Flexible memory configuration

Real-time emulation memory is available as substitution or replacement memory in your embedded design. Emulation memory sizes are available in 128 Kbytes, 512 Kbytes, or 1 Mbyte according to the processor selected. Basic assignable memory attributes include target or emulation, and RAM, ROM, or guarded memory. Emulation memory accesses can also be synchronized to target system READY. Dual-port emulation memory lets you display and modify emulation memory locations without interrupting target processor execution. All of these features give you broad flexibility in a nonintrusive development environment.

Emulation bus analysis

Dual-bus architecture provides real-time, nonintrusive analysis. This allows traces to be set up and reviewed without breaking processor execution.

Tracing microprocessor code flow is a major strength of the HP 64700 series emulators and analyzers. Up to eight hardware resources, each consisting of addresses, data, and status event comparators, can be combined in sequential trace specifications, using "find A, followed by B..." constructs up to eight levels deep. A range comparator can be applied to address or data events at any one of these levels. The analyzer will trigger on and store all subsequent execution or store only certain execution information.

Precise time tagging of events helps you identify discrepancies in code execution times. Each event is logged into the analyzer with an execution time. Bus cycle, instruction and module duration times can be measured at full processor speeds with 40 ns resolution.

Prestore assists you in pinpointing possible problem areas in your code. For example, prestore determines which of several different functions is accessing a variable and is responsible for corrupting it.

These comprehensive resources in the emulation bus analyzer combine to solve both simple and complex problems.

Robust symbolic support

Symbolic debugging clarifies trace list interpretation by allowing you to see program symbols in the trace list. This facilitates quick identification of problems involving the interaction of software and hardware. You also can use symbols in emulation commands and expressions to simplify command entries and user interaction.

Code coverage analysis

Real-time code coverage analysis by the emulators is an important feature for assessing test program coverage. The coverage analyzer records emulation memory locations accessed by executing code. This information is displayed as a measure of what percentage of memory is being accessed. Unaccessed or accessed memory addresses can be listed to determine quickly how exhaustive a test suite has been.

External state/timing analysis

Sixteen channels of state and timing analysis is available on a 64-channel emulation bus analyzer that can be used with many emulators. The external analyzer can serve as a stand-alone logic analyzer or can be coupled with the emulation bus analyzer for correlation of microprocessor activity with other target system activity. The two analyzers can cross trigger or arm each other, based on hardware or software events that one analyzer detects.

Coordinated measurement bus

Designs involving multiple microprocessors can take advantage of the Coordinated Measurement Bus (CMB) for synchronized execution (start/stop) of multiple emulators. To help understand and isolate relationships between processors, up to 32 emulators and analyzers can be set up to cross trigger one another. A BNC connector on the card cage can drive or receive a trigger signal to allow cross triggering of logic analyzers, oscilloscopes, and other instruments.

NEC V25 and V25+/V35+ (uPD70320/322, uPD70325/uPD70335)

The HP 64731 and 64754/64755 emulators provide real-time, transparent emulation and analysis for NEC V25 microprocessors and V25+/V35+ microcontrollers. A full feature set provides power and flexibility for your development needs.

In addition to the emulation and analysis features described in the HP 64700 system overview, these emulators provide the following:

Features

Emulation

- Optional softkey interface or PC-user interface for symbolic debug and a friendly, windowed user environment
- 32 software breakpoints
- Display and modify functions for all registers (including SFR), memory, and I/O ports
- Coordinated Measurement Bus for synchronization and cross triggering with up to 32 HP emulators/analyzers
- Two-foot-long, flexible, slim emulation cable, terminating in an 84-pin PLCC probe
- Optional LAN interface for use with HP 9000 Series workstations

Analysis

- 48-channel emulation bus analyzer
- Disassembly of V25 and V25+/V35+ instruction sets
- Real-time instruction dequeueing
- Display trace compress mode (in softkey interface)
- Tracing on internal ROM access, and macro service
- Real-time code coverage analysis

V25 Memory

- Real-time, no wait-state execution up to 8 MHz
- 128 or 512 Kbytes of emulation memory, mappable in 256-byte blocks

V25+/V35+ Memory

- Real-time, no wait-state execution up to 10 MHz
- 128 or 512 Kbytes of emulation memory, mappable in 512-byte blocks

Specifications

V25 compatibility: HP 64731 Emulator is compatible with NEC V25 (uPD70320/322) and any other microprocessors that comply with the specifications of this processor.

V25+/V35+ compatibility: HP 64754/64755 Emulators are compatible with NEC V25+/V35+ and any other micro-controllers that comply with the specifications of these microcontrollers.

Electrical

Maximum external clock speed:
V25: 8 MHz with no wait-states required for target system or emulation memory.
V25+/V35+: 10 MHz with no wait-states required for target system or emulation memory.

Internal clock speed:
V25: 8 MHz. **V25+/V35+:** 10 MHz.

V25 data inputs: one HCT load plus approx. 30 pF; 10 kohm pull-up.

V25+/V35+ data inputs: NMI, X1, X2, RESET HCMOS load; Port1/Port2 except NMI, READY, INT DMARQ0, DMARQ1, HLDRQ unbuffered to CPU; others HCT load, approx 40 pF additional capacitance. All inputs except INT, DMARQ0, DMARQ1, HLDRQ 10 kohm pull-up to Vcc; INT, DMARQ0, DMARQ1, HLDRQ 4.7 kohm pull-down.

V25 data outputs: one HCT load plus approx 30 pF; 100 kohm pull-down.

V25+/V35+ data outputs: HCT outputs, approx 40 pF additional capacitance and 10 kohm pull-up to Vcc.

Power: V25: 10 mA drawn from target system; **V25+/V35+:** 30 mA at +5 V drawn from target system; all other power supplied by emulator.

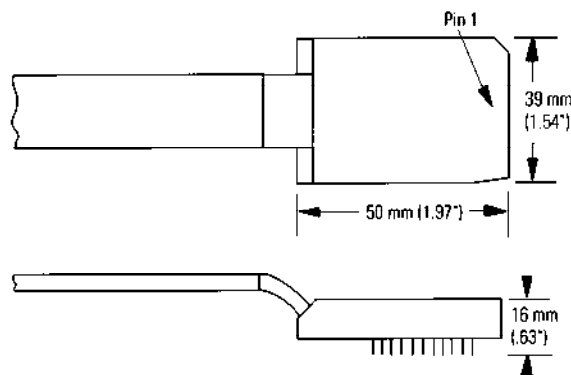### Regulatory Compliance

(when installed in HP 64700A card cage)

Electromagnetic interference: VDE 0871/6.78 Level A; C.I.S.P.R. 11.

Safety approvals: Self-certified to UL 1244, IEC 348, CSA 22.2.

Physical

Cable length: emulator to target system, approx 610 mm (2 ft).

Probe dimensions:

Ordering Information

Complete Emulation System

Model	Description
64731F	V25 Emulator
64754F	V25+ Emulator
64755F	V35+ Emulator
64726A	16-bit, 128 Kbyte emulation memory
64700A	Card cage
64706A	48-channel emulation bus analyzer

Emulation System Options

64727A	16-bit, 512 Kbyte emulation memory
64703A	64-channel emulation bus analyzer and 16-channel state/timing analyzer
64731S	V25 Host Interface
Opt 004*	Softkey Interface hosted on HP 9000 Series 300/400 Computer
Opt 006	PC Interface and V25 Cross Assembler/Linker
64754S	V25+ (uPD70325) Host Interface Software
Opt 004*	Softkey Interface hosted on HP 9000 Series 300/400 Computer
Opt 006	PC Interface
64755S	V35+ (uPD70335) Host Interface Software
Opt 004*	Softkey Interface hosted on HP 9000 Series 300/400 Computer
Opt 006	PC Interface
64873	Cross Assembler/Linker for NEC V Series
Opt 004	For HP 9000 Series 300/400 Computer System
64906	C Cross compiler for NEC V Series
Opt 004	For HP 9000 Series 300/400 Computer System
64701A	LAN (supported on HP 9000 Series workstations)
64037A	RS-422 Interface Card for PC compatibles
98659A	RS-422 Interface Card for HP 9000 Series workstations
64023A	CMB cable (4 m long; includes three 9-pin connectors)

Note: An RS-232 interface is included with all HP 64700A Card cages.

Software Support

HP provides software upgrades through purchase of Software Materials Subscription (SMS) service. Contact your HP field engineer for more information.

* Requires HP 64801 Operating Environment software.

NEC V33 (uPD70136)

Hewlett-Packard 64756 Series emulators provide real-time transparent emulation and analysis for the NEC V33 (uPD70136) microprocessor. A powerful feature set makes this a versatile microprocessor development tool.

Features

Emulation

- Optional softkey interface or PC-user interface for symbolic debug and a friendly, windowed user environment
- 32 software breakpoints
- Display and modify functions for all registers, memory, and I/O
- Coordinated Measurement Bus for synchronization and cross triggering with up to 32 HP 64700 Series emulators/analyzers
- 1.5-foot-long, flexible, slim emulation cable, terminating in a 68-pin PLCC probe
- Two independent RS-232-C serial ports, one with RS-422 capability for high-speed upload and download rates
- Optional LAN interface for use with HP 9000 Series workstations

Analysis

- 64-channel emulation bus analyzer
- Support for FPU (uPD72291 or Intel 80287), if installed in your target system
- Disassembly of V33 instruction set and uPD72291 or Intel 80287 instruction set
- Real-time instruction dequeueing
- Real-time code coverage analysis
- Choice of foreground or background emulation monitor

Memory

- Real-time, no wait-state execution up to 16 MHz
- 128K, 512 Kbytes, or 1 Mbyte of emulation memory, mappable in 256-byte blocks

Specifications

Compatibility: compatible with NEC V33 and any other microprocessors that comply with the specifications of this processor.

Electrical

Maximum external clock speed: 16 MHz with no wait-states required for target system or emulation memory.

Internal clock speed: 16 MHz.

Data inputs: CLK, H-level: 4.0 V min; L-level: 0.6 V max; others H-level: 2.2 V min; L-level: 0.8 V max. All inputs have approx 40 pF additional capacitance. All inputs except CLK 10 kohm pull-up to Vcc.

Data outputs: all outputs, except BCYST and DSTB, FCT outputs; BCYST and DSTB unbuffered. All outputs have approx 40 pF additional capacitance and 10 kohm pull-up to Vcc.

Power: 30 mA at +5 V drawn from target system; all other power supplied by emulator.

Regulatory Compliance
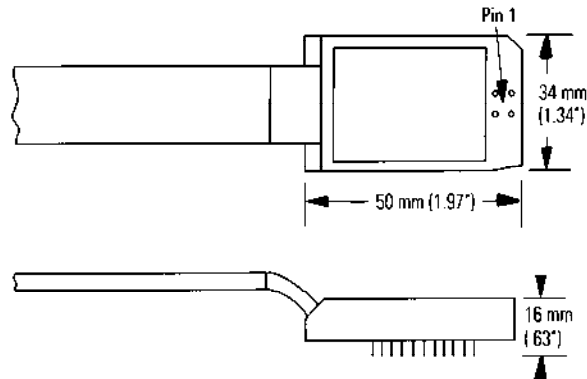
(when installed in HP 64700A card cage)

Electromagnetic Interference: VDE 0871/6.78 Level A; C.I.S.P.R. 11.

Safety approvals: self-certified to UL 1244, IEC 348, CSA 22.2.

Physical

Cable length: emulator to target system, approx 450 mm (1.5 ft).

Probe dimensions:

Ordering Information

Complete Emulation System

Model	Description
64756F	V33 Emulator
64726A	16-bit, 128 Kbyte emulation memory
64704A	80-channel emulation bus analyzer
64700A	Card cage

Emulation System Options

Model	Description
64727A	16-bit, 512 Kbyte emulation memory
64728A	16-bit, 1 Mbyte emulation memory
64703A	64-channel emulation bus analyzer and 16-channel state/timing analyzer
64756S	V33 Host Interface Software
Opt 004*	Softkey Interface hosted on HP 9000 Series 300/400 Computer
Opt 006	PC Interface
64873L/M/U	Cross assembler/linker for NEC V Series
Opt 004	For HP 9000 Series 300/400 Computer System
64875L/M/U	Extended mode locator for NEC V33/53
Opt 004	For HP 9000 Series 300/400 Computer System
64911L/M/U	C cross compiler for NEC V33/53
Opt 004	For HP 9000 Series 300/400 Computer System
64701A	LAN (supported on HP 9000 Series workstations)
64037A	RS-422 Interface card for PC compatibles
98659A	RS-422 Interface card for HP 9000 Series workstations
64023A	CMB cable (4 m long; includes three 9-pin connectors)

Note: An RS-232 interface is included with all HP 64700A card cages.

Software Support

HP provides software upgrades through purchase of Software Materials Subscription (SMS) service. Contact your HP field engineer for more information.

* Requires HP 64801 Operating Environment software.

NEC V40 (uPD70208)

The modular HP 64791A emulator and analyzer provides real-time transparent emulation and analysis for NEC V40 (uPD70208) microprocessors.

In addition to the emulation and analysis features described in the HP 64700 system overview, this emulator provides the following:

Features

- Real-time, no-wait-state execution up to 10 MHz
- Choice of foreground or background emulation monitor
- 124 Kbytes of emulation memory mappable in 128-byte blocks, 508 Kbytes of emulation memory mappable in 128-byte blocks, or 1 Mbyte of emulation memory mappable in 128-byte blocks
- Support for FPU (8087) if installed in your target system
- Disassembly of V40 or 8088 instruction set
- Real-time instruction dequeuing
- Display and modify functions for all registers, memory, and I/O

- Real-time code coverage analysis
- Coordinated Measurement Bus for synchronization and cross triggering with up to 32 HP 64700 Series emulators and analyzers
- Eight real-time hardware breakpoints
- 32 software breakpoints
- 1.5-foot flexible, slim emulation cable terminating in a 68-pin PLCC probe
- Two independent RS-232-C serial ports, one with RS-422 capability for high-speed emulation upload and download rates

Specifications

Processor compatibility: compatible with NEC V40 (uPD70208) and any other microprocessors that comply with the specifications of this microprocessor.

Electrical

Maximum external clock speed: 10 MHz with no wait states required for emulation or target memory.

Internal clock speed: 8 MHz.

Data inputs: H-level: 2.2 V min, L-level: 0.8 V max; All inputs have approx 40 pF additional capacitance. 10 kohm pull-up on all inputs except INTP1-7, HLDRQ, NMI, DMARQ0-3. 100 kohm pull-up on INTP1-7, HLDRQ, NMI, DMARQ0-3.

Data outputs: All outputs FCT outputs. All outputs have approx 40pF additional capacitance and 10 kohm pull-up to Vdd.

Power: 30 mA at +5 V drawn from target system; all other power supplied by the emulator.

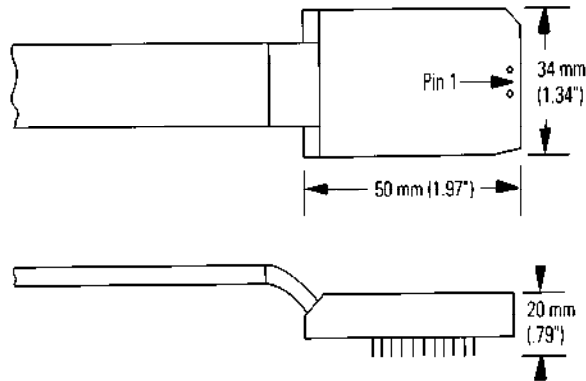### Regulatory Compliance

(when installed in HP 64700A card cage)

Electromagnetic interference: VDE 0871 Level A; C.I.S.P.R. 11.

Safety approvals: Self-certified to UL 1244, IEC 348, CSA 556B, ANSI-C39.5.

Physical

Cable length: emulator to target system, approx 450 mm (1.5 ft).

Probe dimensions:

Ordering Information

Complete Emulation System

Model	Description
64791A	V40 (uPD70208) Emulator
64726A	16-bit, 128 Kbyte emulation memory
64703A	64-channel emulation bus analyzer and 16-channel state/timing analyzer
64700A	Card cage

Emulation System Options

64727A	16-bit, 512 Kbyte emulation memory
64728A	16-bit, 1 Mbyte emulation memory
64704A	80-channel emulation bus analyzer
64701A	LAN (supported on HP 9000 Series workstations)
64791S	V40 (uPD70208) Host Interface Software
Opt 004*	Softkey Interface hosted on HP 9000 Series 300/400 Computer
Opt 006	PC Interface on IBM PC/XT, PC/AT, HP Vectra PCs and compatibles
64873L/M/U	Cross Assembler/Linker for NEC V Series
Opt 004	For HP 9000 Series 300/400 Computer System
64906L/M/U	C Cross compiler for NEC V Series
Opt 004	For HP 9000 Series 300/400 Computer System
64037A	RS-422 Interface card for PC compatibles
98659A	RS-422 Interface card for HP 9000 Series workstations
64023A	CMB cable (4 m long; includes three 9-pin connectors)

Note: An RS-232 interface is included with all HP 64700A card cages.

Software Support

HP provides software upgrades through purchase of Software Materials Subscription (SMS) service. Contact your HP field engineer for more information.

* Requires HP 64801 Operating Environment software.

NEC V50 (uPD70216)

The modular HP 64792A emulator and analyzer provides real-time transparent emulation and analysis for NEC V50 (uPD70216) microprocessors.

In addition to the emulation and analysis features described in the HP 64700 system overview, this emulator provides the following:

Features

- Real-time, no-wait-state execution up to 10 MHz
- Choice of foreground or background emulation monitor
- 124 Kbytes of emulation memory mappable in 128-byte blocks, 508 Kbytes of emulation memory mappable in 128-byte blocks, 1 Mbyte of emulation memory mappable in 128-byte blocks
- Support for FPU (8087) if installed in your target system
- Disassembly of V50 or 8086 instruction set
- Real-time instruction dequeuing
- Display and modify functions for all registers, memory, and I/O

- Real-time code coverage analysis
- Coordinated Measurement Bus for synchronization and cross triggering with up to 32 HP 64700 Series emulators and analyzers
- Eight real-time hardware breakpoints
- 32 software breakpoints
- 1.5-foot flexible, slim emulation cable terminating in a 68-pin PLCC probe
- Two independent RS-232-C serial ports, one with RS-422 capability for high-speed emulation upload and download rates

Specifications

Processor compatibility: compatible with NEC V50 (uPD70216) and any other microprocessors that comply with the specifications of this microprocessor.

Electrical

Maximum external clock speed:
10 MHz with no wait states required for emulation or target memory.

Internal clock speed: 8 MHz.

Data inputs: H-level: 2.2 V min, L-level: 0.8 V max; All inputs have approx 40 pF additional capacitance. 10 kohm pull-up on all inputs except INTP1-7, HLDRQ, NMI, DMARQ0-3. 100 kohm pull-up on INTP1-7, HLDRQ, NMI, DMARQ0-3.

Data outputs: All outputs FCT outputs. All outputs have approx 40pF additional capacitance and 10 kohm pull-up to Vdd.

Power: 30 mA at +5 V drawn from target system; all other power supplied by the emulator.

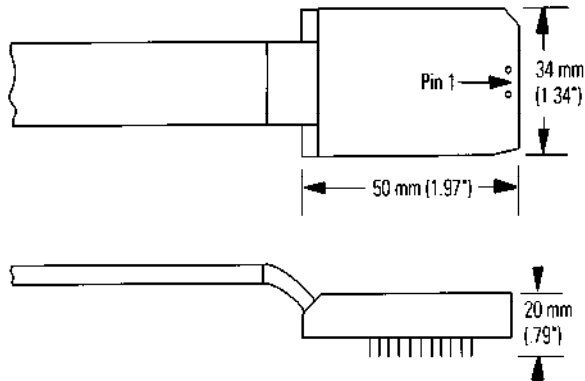### Regulatory Compliance

(when installed in HP 64700A card cage)

Electromagnetic interference: VDE 0871 Level A; C.I.S.P.R. 11.

Safety approvals: Self-certified to UL 1244, IEC 348, CSA 556B, ANSI-C39.5.

Physical

Cable length: emulator to target system, approx 450 mm (1.5 ft).

Probe dimensions:

Ordering Information

Complete Emulation System

Model	Description
64792A	V50 (uPD70216) Emulator
64726A	16-bit, 128 Kbyte emulation memory
64703A	64-channel emulation bus analyzer and 16-channel state/timing analyzer
64700A	Card cage

Emulation System Options

64727A	16-bit, 512 Kbyte emulation memory
64728A	16-bit, 1 Mbyte emulation memory
64704A	80-channel emulation bus analyzer
64701A	LAN (supported on HP 9000 Series workstations)
64792S	V50 (uPD70216) Host Interface Software
Opt 004*	Softkey Interface hosted on HP 9000 Series 300/400 Computer
Opt 006	PC Interface on IBM PC/XT, PC/AT, HP Vectra PCs and compatibles
64873L/M/U	Cross Assembler/Linker for NEC V Series
Opt 004	For HP 9000 Series 300/400 Computer System
64906L/M/U	C Cross compiler for NEC V Series
Opt 004	For HP 9000 Series 300/400 Computer System
64037A	RS-422 Interface card for PC compatibles
98659A	RS-422 Interface card for HP 9000 Series workstations
64023A	CMB cable (4 m long; includes three 9-pin connectors)

Note: An RS-232 interface is included with all HP 64700A card cages.

Software Support

HP provides software upgrades through purchase of Software Materials Subscription (SMS) service. Contact your HP field engineer for more information.

* Requires HP 64801 Operating Environment software.

NEC V53 (uPD70236)

HP 64757 series emulators provide real-time, transparent emulation and analysis for the NEC V53 (uPD70236) micro-processor. With the wide range of features provided, the HP 64757 series constitutes a powerful solution in a development environment.

Features

Emulation

- Optional softkey interface or PC-user interface for symbolic debug and a friendly, windowed user environment
- 32 software breakpoints
- Display and modify functions for all registers, memory, and I/O
- Coordinated Measurement Bus for synchronization and cross triggering with up to 32 HP 64700 Series emulators/analyzers
- Choice of foreground or background emulation monitor
- 1.5-foot-long, flexible, slim emulation cable, terminating in a 132-pin PGA probe
- Two independent RS-232-C serial ports, one with RS-422 capability for high-speed upload and download rates
- Optional LAN interface for use with HP 9000 Series workstations

Analysis

- 64-channel emulation bus analyzer with 16-channel state and timing analyzer
- Support for FPU (uPD72291 or Intel 80287), if installed in your target system
- Disassembly of V53 instruction set and uPD72291 or Intel 80287 instruction set
- Real-time analysis of all address, data, and state lines
- Powerful sequencing and windowing capability for analysis of multitasking operating systems
- Real-time instruction dequeueing
- Real-time code coverage analysis
- Choice of foreground or background emulation monitor

Memory

- Real-time, no wait-state execution up to 16 MHz
- 128, 512 Kbytes, or 1 Mbyte of emulation memory, mappable in 256-byte blocks

Specifications

Compatibility: compatible with NEC V53 and any other microprocessors that comply with the specifications of this processor.

Electrical

Maximum external clock speed: 16 MHz with no wait-states required for target system or emulation memory.

Internal clock speed: 16 MHz.

Data inputs: CLK, H-level: 2.2 V min; L-level: 0.8 V max. All inputs have approx 40 pF additional capacitance. All inputs except END/tc 10 kohm pull-up to Vcc. END/TC 4.7 kohm pull-up to Vcc.

Data outputs: all outputs FCT outputs. All outputs have approx 40 pF additional capacitance and 10 kohm pull-up to Vcc.

Power: 30 mA at +5 V drawn from target system; all other power supplied by emulator.

Regulatory Compliance
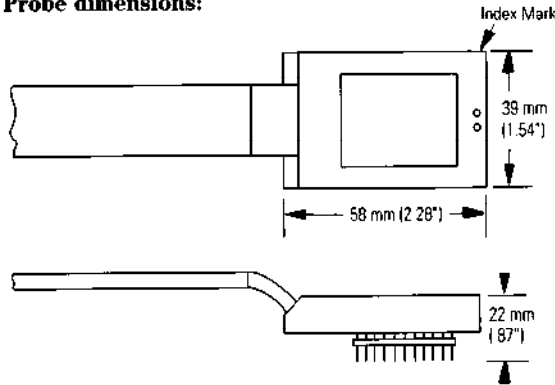
(when installed in HP 64700A card cage)

Electromagnetic interference: VDE 0871/6.78 Level A; C.I.S.P.R. 11.

Safety approvals: self-certified to UL 1244, IEC 348, CSA 22.2.

Physical

Cable length: emulator to target system, approx 450 mm (1.5 ft).

Probe dimensions:

Ordering Information

Complete Emulation System

Model	Description
64757F	V53 Emulator
64726A	16-bit, 128 Kbyte emulation memory
64704A	80-channel emulation bus analyzer
64700A	Card cage

Emulation System Options

64727A	16-bit, 512 Kbyte emulation memory
64728A	16-bit, 1 Mbyte emulation memory
64703A	64-channel emulation bus analyzer and 16-channel state/timing analyzer
64757S	V53 Host Interface Software
Opt 004*	Softkey Interface hosted on HP 9000 Series 300/400 Computer
Opt 006	PC Interface
64873L/M/U	Cross Assembler/Linker for NEC V Series
Opt 004	For HP 9000 Series 300/400 Computer System
64875L/M/U	Extended mode locator for NEC V33/53
Opt 004	For HP 9000 Series 300/400 Computer System
64911L/M/U	C cross compiler for NEC V33/53
Opt 004	For HP 9000 Series 300/400 Computer System
64701A	LAN (supported on HP 9000 Series workstations)
64037A	RS-422 Interface Card for PC compatibles
98659A	RS-422 Interface Card for HP 9000 Series workstations
64023A	CMB cable (4 m long; includes three 9-pin connectors)

Note: An RS-232 interface is included with all HP 64700A card cages.

Software Support

HP provides software upgrades through purchase of Software Materials Subscription (SMS) service. Contact your HP field engineer for more information.

* Requires HP 64801 Operating Environment software.

NEC V70 (uPD70632)

HP 64758 emulators provide real-time, transparent emulation and analysis for the NEC V70 (uPD70632) microprocessor. Features provided by the HP 64758 results in a flexible, powerful development solution.

Features

Emulation

- Optional softkey interface or PC-user interface for symbolic debug and a friendly, windowed user environment
- 32 software breakpoints
- Display and modify functions for all registers, memory (virtual/actual), and I/O
- Coordinated Measurement Bus for synchronization and cross triggering with up to 32 HP 64700 Series emulators/analyzers
- 1.5-foot-long, flexible, slim emulation cable, terminating in a 132-pin PGA probe
- Two independent RS-232-C serial ports, one with RS-422 capability for high-speed upload and download rates
- Optional LAN interface for use with HP 9000 Series workstations

Analysis

- 80-channel emulation analyzer
- Disassembly of V70 and V20/V30 instruction set
- Selectable virtual or actual address for emulation analyzer
- Display of address translation tables
- Real-time analysis of all address, data, and status lines
- Powerful sequencing and windowing capability for analysis of multitasking operating systems
- Real-time code coverage analysis
- Choice of foreground or background emulation monitor

Memory

- Real-time, no wait-state execution up to 20 MHz
- 512 Kbytes or 1 Mbyte of emulation memory, mappable in 4-Kbyte blocks

Specifications

Compatibility: compatible with NEC V70 and any other microprocessors that comply with the specifications of this processor.

Electrical

Maximum external clock speed: 20 MHz with no wait-states required for target system or emulation memory.

Internal clock speed: 20 MHz.

Data inputs: D0-D31, /IOSZEN, IO8/ IO16: 1 FCT load, 10 kohm pull-up to Vcc; CLK, /BERR, /READY, RT/EP: 1 FCT load; RESET, /NMI, INT, /HLDRQ, BREZ, FMST/FCHK: 1 PAL load, 10 kohm pull-up to Vcc; /CPBUSY, CPERR, CPEND: 2 FCT load, 10 kohm pull-up to Vcc; all inputs have approx 40 pF additional capacitance.

Data outputs: approx 40 pF load; A0-A31, D0-D31, /HLDAK_L: 10 kohm pull-up to Vcc; all other outputs, 1 kohm pull-up to Vcc.

Power: 16 mA at +5 V drawn from target system; all other power supplied by emulator.

Regulatory Compliance
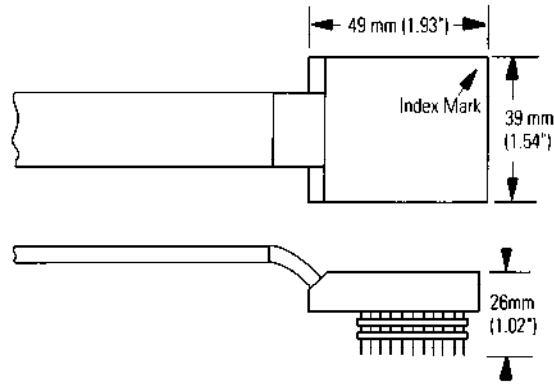
(when installed in HP 64700A card cage)

Electromagnetic interference: VDE 0871/6.78 Level A; C.I.S.P.R. 11.

Safety approvals: self-certified to UL 1244, IEC 348, CSA 22.2.

Physical

Cable length: emulator to target system, approx 450 mm (1.5 ft).

Probe dimensions:

Ordering Information

Complete Emulation System

Model	Description
64758G	V70 Emulator with 512 Kbytes emulation memory
64758H	V70 Emulator with 1 Mbyte emulation memory
64704A	80-channel emulation bus analyzer
64700A	Card cage

Emulation System Options

64758S	V70 Host Interface Software
Opt 004*	Softkey Interface hosted on HP 9000 Series 300/400 Computer
Opt 006	PC Interface
64701A	LAN (supported on HP 9000 Series workstations)
64037A	RS-422 Interface Card for PC compatibles
98659A	RS-422 Interface Card for HP 9000 Series workstations
64023A	CMB cable (4 m long; includes three 9-pin connectors)

Note: An RS-232 interface is included with all HP 64700A card cages.

Software Support

HP provides software upgrades through purchase of Software Materials Subscription (SMS) service. Contact your HP field engineer for more information.

* Requires HP 64801 Operating Environment software.

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HP Sales and Support Offices

United States:
Microprocessor Development Hotline
(800) 447-3282

Canada:
Hewlett-Packard Ltd.
6877 Goreway Drive
Mississauga, Ontario L4V 1M8
(416) 678 9430

European Headquarters:
Hewlett-Packard S.A.
150, Route du Nant d'Avril
1217 Meyrin 2
Geneva, Switzerland
41/22 780 8111

Japan:
Yokogawa-Hewlett-Packard Ltd.
15-7, Nishi Shinjuku 4 Chome
Shinjuki-ku
Tokyo 160, Japan
(03) 5371 1351

Latin America:
Latin American Region Headquarters
Monte Pelvoux No. 111
Lomas de Chapultepec
11000 Mexico, D.F. Mexico
(525) 202 0155

Australia/New Zealand:
Hewlett-Packard Australia Ltd.
31-41 Joseph Street
Blackburn, Victoria 3130
Melbourne, Australia
(03) 895 2895

Far East:
Hewlett-Packard Asia Ltd.
22/F Bond Centre, West Tower
89 Queensway, Central, Hong Kong
8487777