

V Series™

User's
Manual



V25+™ and V35+™

16/8-Bit and 16-Bit Microcomputers

December 1992

NEC

NOTES FOR CMOS DEVICES

① PRECAUTION AGAINST ESD FOR SEMICONDUCTORS

Note:

Strong electric field, when exposed to a MOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop generation of static electricity as much as possible, and quickly dissipate it once, when it has occurred. Environmental control must be adequate. When it is dry, humidifier should be used. It is recommended to avoid using insulators that easily build static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work bench and floor should be grounded. The operator should be grounded using wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions need to be taken for PW boards with semiconductor devices on it.

② HANDLING OF UNUSED INPUT PINS FOR CMOS

Note:

No connection for CMOS device inputs can be cause of malfunction. If no connection is provided to the input pins, it is possible that an internal input level may be generated due to noise, etc., hence causing malfunction. CMOS devices behave differently than Bipolar or NMOS devices. Input levels of CMOS devices must be fixed high or low by using a pull-up or pull-down circuitry. Each unused pin should be connected to V_{DD} or GND with a resistor, if it is considered to have a possibility of being an output pin. All handling related to the unused pins must be judged device by device and related specifications governing the devices.

③ STATUS BEFORE INITIALIZATION OF MOS DEVICES

Note:

Power-on does not necessarily define initial status of MOS device. Production process of MOS does not define the initial operation status of the device. Immediately after the power source is turned ON, the devices with reset function have not yet been initialized. Hence, power-on does not guarantee out-pin levels, I/O settings or contents of registers. Device is not initialized until the reset signal is received. Reset operation must be executed immediately after power-on for devices having reset function.

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NEC devices are classified into the following three quality grades:

"Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.

PREFACE

Target Readers

This manual is intended for user engineers who wish to understand the μ PD70325 and 70335 (also called V25+ or V35+) functions and who plan to design application systems using these devices.

Purpose

This manual's purpose is to help the user understand the hardware functions of the μ PD70325 and 70335 as listed below.

Organization

The user's manuals for the μ PD70325 and 70335 are divided into two editions: a hardware edition (this manual) and an instruction edition.

Hardware edition (This manual)	Instruction edition
<ul style="list-style-type: none">• General description• Pin functions• Internal CPU functions• Internal peripheral devices• Standby function• Reset function• Appendix (Restrictions, Q&A)	<ul style="list-style-type: none">• General description• Explanation of instructions• Added instructions (not provided in but provided in V25 and V35) V20, V30• Appendix

How to read this manual

This manual assumes that the reader has general knowledge of electricity, logic circuits, and microcontrollers.

For readers who have experience using the μ PD70108 or 70116 (also called V20TM or V30TM)

→ Instructions of the V25+ and V35+ are compatible with those of the V20 and V30 in the native mode. See chapter 3 "ADDITIONAL INSTRUCTIONS FOR THE V20 AND V30" in the instruction edition of "V25, V35 FAMILY USER'S MANUAL."

For readers who have experience using the μ PD70320 or 70330 (also called V25TM or V35TM)

→ V25+ and V35+ have the same functions as the ROM-less version of V25 and V35. Therefore, mainly see section 1.2 "Differences with V25 and V35."

For details of instruction functions

→ See the instruction edition of "V25, V35 FAMILY USER'S MANUAL."

For a general understanding of V25+ and V35+ functions

→ Read this manual from chapter 1.

If you have questions about operation of the V25+ or V35+

→ See appendix C Q & A.

For information on the V25+ and V35+'s electrical characteristics

→ See the relevant data sheet (separately available).

For information on application examples of the V25+ and V35+'s functions

→ See the relevant application note (separately available).

**Terms and
conventions
used in this
manual**

Data representation weight	:	High-order digits at left and low-order digits at right
Active low representation	:	<u>xxx</u> (pin or signal name is overlined)
Memory map address	:	High order at low stage and low order at high stage
Note	:	Explanation of (Note) in the text
Caution	:	Item deserving extra attention
Remark	:	Supplementary explanation to the text
Number representation	:	Binary number is xxxx or xxxxB Decimal number is xxxx Hexadecimal number is xxxxH

Suffix representing an exponent of 2 (in address space or memory capacity)

K (Kilo): $2^{10} = 1024$

M (Mega): $2^{20} = 1024^2$

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