
EM78P447N

**8-Bit Microprocessor
with OTP ROM**

**Product
Specification**

DOC. VERSION 1.5

ELAN MICROELECTRONICS CORP.


January 2010



Trademark Acknowledgments:

IBM is a registered trademark and PS/2 is a trademark of IBM.

Windows is a trademark of Microsoft Corporation.

ELAN and ELAN logo  are trademarks of ELAN Microelectronics Corporation.

Copyright © 2003~2010 by **ELAN Microelectronics Corporation**

All Rights Reserved

Printed in Taiwan

The contents of this specification are subject to change without further notice. ELAN Microelectronics assumes no responsibility concerning the accuracy, adequacy, or completeness of this specification. ELAN Microelectronics makes no commitment to update, or to keep current the information and material contained in this specification. Such information and material may change to conform to each confirmed order.

In no event shall ELAN Microelectronics be made responsible for any claims attributed to errors, omissions, or other inaccuracies in the information or material contained in this specification. ELAN Microelectronics shall not be liable for direct, indirect, special incidental, or consequential damages arising from the use of such information or material.

The software (if any) described in this specification is furnished under a license or nondisclosure agreement, and may be used or copied only in accordance with the terms of such agreement.

ELAN Microelectronics products are not intended for use in life support appliances, devices, or systems. Use of ELAN Microelectronics product in such applications is not supported and is prohibited.

NO PART OF THIS SPECIFICATION MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF ELAN MICROELECTRONICS.



ELAN MICROELECTRONICS CORPORATION

Headquarters:

No. 12, Innovation 1st Road
Hsinchu Science Park
Hsinchu, TAIWAN 30076
Tel: +886 3 563-9977
Fax: +886 3 563-9966
webmaster@emc.com.tw
<http://www.emc.com.tw>

Hong Kong:

Elan (HK) Microelectronics Corporation, Ltd.
Flat A, 19F., World Tech Centre 95
How Ming Street, Kwun Tong
Kowloon, HONG KONG
Tel: +852 2723-3376
Fax: +852 2723-7780

USA:

Elan Information Technology Group (U.S.A.)
PO Box 601
Cupertino, CA 95015
U.S.A.
Tel: +1 408 366-8225
Fax: +1 408 366-8225

Shenzhen:

Elan Microelectronics Shenzhen, Ltd.
3F, SSMEC Bldg., Gaoxin S. Ave. I
Shenzhen Hi-tech Industrial Park
(South Area), Shenzhen
CHINA 518057
Tel: +86 755 2601-0565
Fax: +86 755 2601-0500
elan-sz@elanic.com.cn

Shanghai:

Elan Microelectronics Shanghai, Ltd.
#34, First Fl., 2nd Bldg.,
Lane 122, Chunxiao Rd.
Zhangjiang Hi-Tech Park
Shanghai, CHINA 201203
Tel: +86 21 5080-3866
Fax: +86 21 5080-4600
elan-sh@elanic.com.cn

Contents

1	General Description	1
2	Features	1
3	Pin Assignment and Description.....	2
3.1	EM78P447N Series Pin Assignment	2
3.2	EM78P447NAP and EM78P447NAM Pin Description	3
3.3	EM78P447NAS Pin Description	4
3.4	EM78P447NBP, EM78P447NBM, EM78P447NBWM, and EM78P447NBK Pin Description	5
3.5	EM78P447NCK and EM78P447NCM Pin Description	6
3.6	EM78P447NEP and EM78P447NGK Pin Description.....	7
4	Function Description.....	8
4.1	Operational Registers.....	8
4.1.1	R0 (Indirect Addressing Register)	8
4.1.2	R1 (Time Clock/Counter).....	8
4.1.3	R2 (Program Counter) and Stack	9
4.1.4	R3 (Status Register).....	11
4.1.5	R4 (RAM Select Register).....	11
4.1.6	R5~R7 (Port 5 ~ Port 7)	11
4.1.7	R8~R1F and R20~R3E (General Purpose Registers).....	12
4.1.8	R3F (Interrupt Status Register)	12
4.2	Special Function Registers	12
4.2.1	A (Accumulator).....	12
4.2.2	CONT (Control Register).....	12
4.2.3	IOC5 ~ IOC7 (I/O Port Control Register)	13
4.2.4	IOCB (Wake-up Control Register for Port 6).....	13
4.2.5	IOCE (WDT Control Register).....	14
4.2.6	IOCF (Interrupt Mask Register).....	16
4.3	TCC/WDT and Prescaler.....	16
4.4	I/O Ports	17
4.5	Reset and Wake-up.....	18
4.5.1	Reset	18
	4.5.1.1 <i>Sleep 2 and Sleep 1 Modes Operation Summary</i>	20
	4.5.1.2 <i>Register Initial Values after Reset</i>	21
4.5.2	Status of RST, T, and P of Status Register	22
4.6	Interrupt	23
4.7	Oscillator	24
4.7.1	Oscillator Modes.....	24
4.7.2	Crystal Oscillator/Ceramic Resonators (Crystal).....	25