EM78P259N

8-Bit Microprocessor with OTP ROM

Product Specification

DOC. VERSION 1.4

ELAN MICROELECTRONICS CORP.

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ELAN MICROELECTRONICS CORPORATION

Headquarters:

No. 12, Innovation Road 1
Hsinchu Science Park
Hsinchu, Taiwan 308
Tel: +886 3 563-9977
Fax: +886 3 563-9966
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
elanhk@emc.com.hk

USA:

Elan Information Technology Group (USA)
P.O. Box 601
Cupertino, CA 95015
USA
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

Shanghai:

Elan Microelectronics Shanghai, Ltd.
#23, Zone 115, Lane 572, Bibo Rd.
Zhangjiang Hi-Tech Park
Shanghai, CHINA 201203
Tel: +86 21 5080-3866
Fax: +86 21 5080-4600

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APPENDIX

Specification Revision History

Doc. Version	Revision Description	Date
1.0	Initial official version	2005/06/16
1.1	Added the IRC drift rate in the feature	2006/05/29
1.2	1. Improved the contents and format of the Features section, Figure 4-1 *EM78P259N/260N Functional Block Diagram*, Figure 6-2 *TCC and WDT Block Diagram* and Figure 6-11 *IR/PWM System Block Diagram*. 2. Modified Section 6.7 *Analog-to-Digital Converter*(ADC) 3. Modified Section 6.13.1 *Code Option Register (Word 0)* and Section 6.13.2 *Code Option Register (Word 1)* 4. Added Internal RC Electrical Characteristics 5. Modified Section 8.1 *AD Converter Characteristics*, Section 8.2 *Comparator (OP) Characteristics* and Appendix A. *Package Type*.	2007/05/18
1.3	Added EM78P2581N SOP 16-pin Package	2007/10/23
1.4	1. Added DIP, SOP 14-pin Package 2. Renamed as EM78P259N from EM78P2581N, EM78P259N, EM78P260N	2008/01/25

1 General Description

The EM78P259N is an 8-bit microprocessor designed and developed with low-power and high-speed CMOS technology. The device has an on-chip 2K×13-bit Electrical One Time Programmable Read Only Memory (OTP-ROM). It provides a protection bit to prevent intrusion of user's code. Three Code option words are also available to meet user's requirements.

With its enhanced OTP-ROM feature, the EM78P259N provides a convenient way of developing and verifying user's programs. Moreover, this OTP device offers the advantages of easy and effective program updates, using development and programming tools. User can avail of the ELAN Writer to easily program his development code.

2 Features

- CPU configuration
  - 2K×13 bits on-chip ROM
  - 80×8 bits on-chip registers (SRAM)
  - 8-level stacks for subroutine nesting
  - Less than 1.9 mA at 5V/4MHz
  - Typically 15 μA, at 3V/32kHz
  - Typically 1 μA, during Sleep mode
- I/O port configuration
  - 3 bidirectional I/O ports : P5, P6, P7
  - 17 I/O pins
  - Wake-up port : P5
  - 8 Programmable pull-down I/O pins
  - 8 programmable pull-high I/O pins
  - 8 programmable open-drain I/O pins
  - External interrupt : P60
- Operating voltage range
  - Operating voltage: 2.3V~5.5V (Commercial)
  - Operating voltage: 2.5V~5.5V (Industrial)
- Operating temperature range
  - Operating temperature: 0°C ~70°C (Commercial)
  - Operating temperature: -40°C ~85°C (Industrial)
- Operating frequency range
  - Crystal mode:
    DC~20MHz/2clks @ 5V, DC~100ns inst. cycle @ 5V
    DC~8MHz/2clks @ 3V, DC~250ns inst. cycle @ 3V
  - ERC mode:
    DC~16MHz/2clks @ 5V, DC~125ns inst. cycle @ 5V
    DC~8MHz/2clks @ 3V, DC~250ns inst. cycle @ 3V
  - IRC mode:
    Oscillation mode : 4MHz, 8MHz, 1MHz, 455kHz

Internal RC Frequency	Drift Rate			
	Temperature (-40℃ ~85℃)	Voltage (2.3V~5.5V)	Process	Total
4 MHz	±10%	±5%	±4%	±19%
8 MHz	±10%	±6%	±4%	±20%
1 MHz	±10%	±5%	±4%	±19%
455kHz	±10%	±5%	±4%	±19%

All the four main frequencies can be trimmed by programming with four calibrated bits in the ICE259N Simulator. OTP is auto trimmed by ELAN Writer.

- Peripheral configuration
  - 8-bit real time clock/counter (TCC) with selective signal sources, trigger edges, and overflow interrupt
  - 8-bit real time clock/counter (TCCA, TCCC) and 16-bit real time clock/counter (TCCB) with selective signal sources, trigger edges, and overflow interrupt
  - 4-bit channel Analog-to-Digital Converter with 12-bit resolution in Vref mode
  - Easily implemented IR (Infrared remote control) application circuit
  - One pair of comparators or OP
- Six available interrupts:
  - TCC, TCCA, TCCB, TCCC overflow interrupt
  - Input-port status changed interrupt (wake-up from sleep mode)
  - External interrupt
  - ADC completion interrupt
  - Comparators status change interrupt
  - IR/PWM interrupt
- Special features
  - Programmable free running watchdog timer (4.5ms : 18ms)
  - Power saving Sleep mode
  - Selectable Oscillation mode
  - Power-on voltage detector (2.0V ± 0.1V)
- Package type:
  - 14-pin DIP 300mil : EM78P259ND14J/S
  - 14-pin SOP 150mil : EM78P259NSO14J/S
  - 16-pin SOP 150mil : EM78P259NSO16AJ/S
  - 18-pin DIP 300mil : EM78P259ND18J/S
  - 18-pin SOP 300mil : EM78P259NSO18J/S
  - 20-pin DIP 300mil : EM78P259ND20J/S
  - 20-pin SOP 300mil : EM78P259NSO20J/S
  - 20-pin SSOP 209mil : EM78P259NSS20J/S

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