
EM78P259N

**8-Bit Microprocessor
with OTP ROM**

**Product
Specification**

DOC. VERSION 1.4

ELAN MICROELECTRONICS CORP.


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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 | <ol style="list-style-type: none"> 1. Improved the contents and format of the Features section, Figure 4-1 <i>EM78P259N/260N Functional Block Diagram</i>, Figure 6-2 <i>TCC and WDT Block Diagram</i> and Figure 6-11 <i>IR/PWM System Block Diagram</i>. 2. Modified Section 6.7 <i>Analog-to-Digital Converter(ADC)</i> 3. Modified Section 6.13.1 <i>Code Option Register (Word 0)</i> and Section 6.13.2 <i>Code Option Register (Word 1)</i> 4. Added Internal RC Electrical Characteristics 5. Modified Section 8.1 <i>AD Converter Characteristics</i>, Section 8.2 <i>Comparator (OP) Characteristics</i> and Appendix A. <i>Package Type</i>. | 2007/05/18 |
| 1.3 | Added EM78P2581N SOP 16-pin Package | 2007/10/23 |
| 1.4 | <ol style="list-style-type: none"> 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

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

Note: Green products do not contain hazardous substances.

| Internal RC Frequency | Drift Rate | | | |
|-----------------------|---------------------------|---------------------|---------|-------|
| | Temperature (-40°C ~85°C) | 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% |