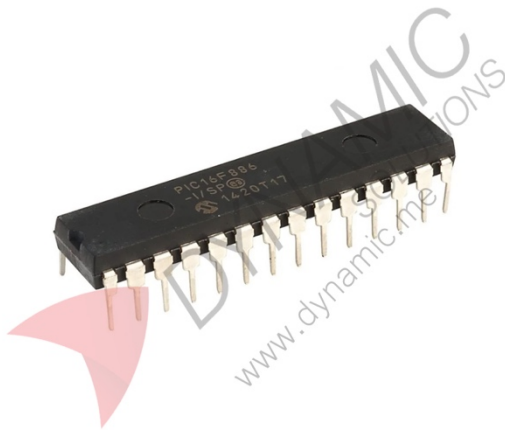


## PIC16F886 8-Bit Microcontroller 28-Pin

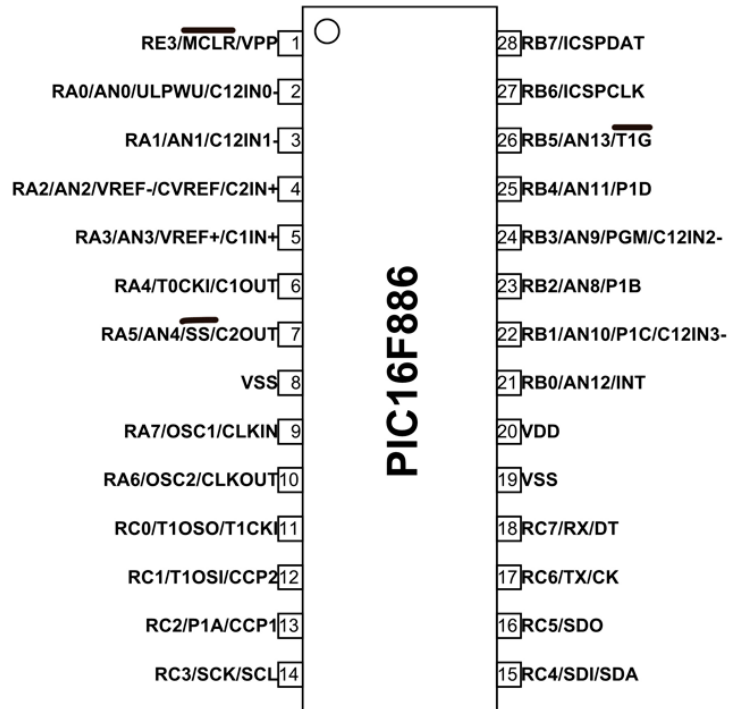


### **Features:**

The PIC16F886 is an 8-bit CMOS microcontroller in a 28-pin package built on Microchip nanoWatt Technology, with 16Kbytes of flash rated for 100000 write/erase cycles, 368 bytes of RAM and 256 bytes of EEPROM. The internal R-C oscillator is factory calibrated to +/-1%, software selectable from 8MHz down to 31kHz, software tunable, and supports crystal fail detect and clock mode switching during operation for power savings. Peripherals include an 11-channel 10-bit ADC, two analog comparators, four PWM channels, one 8-bit and two 16-bit timers, and a programmable watchdog timer on its own oscillator. The device programs over SPI (pins 7, 14, 15, 16), UART (pins 17, 18) or ICSP (pins 27, 28), and connects sensors and displays over I2C (pins 14, 15).

| Specifications          |                                                                                                            |
|-------------------------|------------------------------------------------------------------------------------------------------------|
| Device                  | PIC16F886                                                                                                  |
| Manufacturer            | Microchip Technology                                                                                       |
| CPU                     | 8-bit CMOS                                                                                                 |
| Technology              | nanoWatt                                                                                                   |
| Total Pins              | 28                                                                                                         |
| Programmable Pins       | 24                                                                                                         |
| Program Memory          | 16Kbytes flash, 100000 write/erase cycles                                                                  |
| RAM                     | 368 bytes                                                                                                  |
| EEPROM                  | 256 bytes                                                                                                  |
| CPU Speed               | 1 MIPS at 1MHz                                                                                             |
| ADC                     | 11 channels, 10-bit                                                                                        |
| Timers                  | One 8-bit, two 16-bit                                                                                      |
| Analog Comparators      | 2                                                                                                          |
| PWM Channels            | 4                                                                                                          |
| Internal Oscillator     | 31kHz to 8MHz R-C, factory calibrated to +/-1%                                                             |
| External Oscillator     | up to 20MHz                                                                                                |
| Watchdog Timer          | Programmable, separate on-chip oscillator                                                                  |
| Operating Voltage       | 2.0 to 5.5V                                                                                                |
| Max Current Per I/O Pin | 25mA source, 25mA sink                                                                                     |
| Operating Temperature   | -40 to +125C                                                                                               |
| Dimensions              | 3.5x0.7x0.8cm                                                                                              |
| Power Save Modes        | Available                                                                                                  |
| Usage                   | Embedded control, hobbyist and engineering projects, sensor and display interfacing over I2C, SPI and UART |

### Pinouts:



| Pin Name                  | Description                                                                                                                      |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| RE3/MCLR/VPP              | Port E pin 3, master clear reset input, programming voltage                                                                      |
| RA0/AN0/ULPWU/C12IN0-     | Port A pin 0, analog input 0, ultra low-power wake-up input, comparator C1 or C2 negative input                                  |
| RA1/AN1/C12IN1-           | Port A pin 1, analog input 1, comparator C1 or C2 negative input                                                                 |
| RA2/AN2/VREF-/CVREF/C2IN+ | Port A pin 2, analog input 2, A/D low reference voltage input, comparator voltage reference output, comparator C2 positive input |
| RA3/AN3/VREF+/C1IN+       | Port A pin 3, analog input 3, A/D high reference voltage input, comparator C1 positive input                                     |
| RA4/T0CKI/C1OUT           | Port A pin 4, Timer0 external clock input, comparator C1 output                                                                  |
| RA5/AN4/SS/C2OUT          | Port A pin 5, analog input 4, SPI slave select input, comparator C2 output                                                       |
| VSS                       | Ground                                                                                                                           |
| RA7/OSC1/CLKIN            | Port A pin 7, oscillator pin 1, external clock source input                                                                      |
| RA6/OSC2/CLKOUT           | Port A pin 6, oscillator pin 2, clock source output                                                                              |
| RC0/T1OSO/T1CKI           | Port C pin 0, Timer1 oscillator output, Timer1 external clock input                                                              |
| RC1/T1OSI/CCP2            | Port C pin 1, Timer1 oscillator input, capture 2 input, compare 2 output, PWM2 output                                            |
| RC2/P1A/CCP1              | Port C pin 2, PWM output, capture 1 input, compare 1 output, PWM1 output                                                         |
| RC3/SCK/SCL               | Port C pin 3, SPI clock, I2C clock                                                                                               |
| RC4/SDI/SDA               | Port C pin 4, SPI data input, I2C data I/O                                                                                       |
| RC5/SDO                   | Port C pin 5, SPI data out                                                                                                       |

|                             |                                                                                                       |
|-----------------------------|-------------------------------------------------------------------------------------------------------|
| <b>RC6/TX/CK</b>            | Port C pin 6, EUSART asynchronous transmit, EUSART synchronous clock                                  |
| <b>RC7/RX/DT</b>            | Port C pin 7, EUSART asynchronous receive, EUSART synchronous data                                    |
| <b>VSS</b>                  | Ground                                                                                                |
| <b>VDD</b>                  | Positive power supply                                                                                 |
| <b>RB0/AN12/INT</b>         | Port B pin 0, analog input 12, external interrupt                                                     |
| <b>RB1/AN10/P1C/C12IN3-</b> | Port B pin 1, analog input 10, PWM output, comparator C1 or C2 negative input                         |
| <b>RB2/AN8/P1B</b>          | Port B pin 2, analog input 8, PWM output                                                              |
| <b>RB3/AN9/PGM/C12IN2-</b>  | Port B pin 3, analog input 9, low-voltage ICSP programming enable, comparator C1 or C2 negative input |
| <b>RB4/AN11/P1D</b>         | Port B pin 4, analog input 11, PWM output                                                             |
| <b>RB5/AN13/T1G</b>         | Port B pin 5, analog input 13, Timer1 gate input                                                      |
| <b>RB6/ICSPCLK</b>          | Port B pin 6, serial programming clock                                                                |
| <b>RB7/ICSPDAT</b>          | Port B pin 7, ICSP data I/O                                                                           |