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What is "[Embedded - Microcontrollers](#)"?

"[Embedded - Microcontrollers](#)" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

Applications of "[Embedded - Microcontrollers](#)"

Details

| | |
|----------------------------|---|
| Product Status | Active |
| Core Processor | PIC |
| Core Size | 8-Bit |
| Speed | 16MHz |
| Connectivity | I ² C, SPI, UART/USART |
| Peripherals | Brown-out Detect/Reset, POR, PWM, WDT |
| Number of I/O | 17 |
| Program Memory Size | 3.5KB (2K x 14) |
| Program Memory Type | FLASH |
| EEPROM Size | - |
| RAM Size | 128 x 8 |
| Voltage - Supply (Vcc/Vdd) | 1.8V ~ 5.5V |
| Data Converters | A/D 12x8b |
| Oscillator Type | Internal |
| Operating Temperature | -40°C ~ 125°C (TA) |
| Mounting Type | Surface Mount |
| Package / Case | 20-SSOP (0.209", 5.30mm Width) |
| Supplier Device Package | 20-SSOP |
| Purchase URL | https://www.e-xfl.com/product-detail/microchip-technology/pic16f720-e-ss |

20-Pin 8-Bit CMOS Flash Microcontroller Product Brief

High-Performance RISC CPU:

- Only 35 Instructions to Learn:
 - All single-cycle instructions except branches
- Operating Speed:
 - DC – 16 MHz oscillator/clock input
 - DC – 250 ns instruction cycle
- Up to 4K x 14 Words of Flash Program Memory
- Up to 256 bytes of Data Memory (RAM)
- Interrupt Capability
- 8-Level Deep Hardware Stack
- Direct, Indirect and Relative Addressing modes
- Processor Self-Write/Read access to Program Memory

Special Microcontroller Features:

- Precision Internal Oscillator:
 - 16 MHz or 500 kHz operation
 - Factory calibrated to $\pm 1\%$, typical
 - Software tunable
 - Software selectable $\div 1$, $\div 2$, $\div 4$ or $\div 8$ divider
- Power-Saving Sleep mode
- Industrial and Extended Temperature Range
- Power-on Reset (POR)
- Power-up Timer (PWRT)
- Brown-out Reset (BOR)
- Multiplexed Master Clear with Pull-up/Input Pin
- Programmable Code Protection
- In-Circuit Serial Programming™ (ICSP™) via Two Pins
- High-Endurance Flash Cell:
 - 10,000 write Flash endurance (typical)
 - Flash retention: > 40 years
- Wide Operating Voltage Range:
 - 1.8V to 5.5V (PIC16F720/721)
 - 1.8V to 3.6V (PIC16LF720/721)

Low-Power Features:

- Standby Current:
 - 50 nA @ 1.8V, typical
- Operating Current:
 - 100 μ A @ 1 MHz, 1.8V, typical
- Low-Power Watchdog Timer Current:
 - 500nA @ 1.8V, typical

Peripheral Features:

- Up to 17 I/O Pins and 1 Input-only Pin:
 - High-current source/sink for direct LED drive
 - Interrupt-on-pin change
 - Individually programmable weak pull-ups
- A/D Converter:
 - 8-bit resolution
 - 12 channels
 - Selectable Voltage reference
- Timer0: 8-Bit Timer/Counter with 8-Bit Programmable Prescaler
- Enhanced Timer1
 - 16-bit timer/counter with prescaler
 - External Gate Input mode with toggle and single shot modes
 - Interrupt-on-gate completion
- Timer2: 8-Bit Timer/Counter with 8-Bit Period Register, Prescaler and Postscaler
- Capture, Compare, PWM module (CCP)
 - 16-bit Capture, max resolution 12.5 ns
 - 16-bit Compare, max resolution 250 ns
 - 10-bit PWM, max frequency 15 kHz
- Addressable Universal Synchronous Asynchronous Receiver Transmitter (AUSART)
- Synchronous Serial Port (SSP)
 - SPI (Master/Slave)
 - I²C™ (Slave) with Address Mask

TABLE 1: PIC16F720/721 AND PIC16LF720/721 FAMILY TYPES

| Device | Program Memory Flash (words) | SRAM (bytes) | I/O | Timers 8/16-bit | 8-bit A/D (ch) | AUSART | CCP | SSP |
|------------|------------------------------|--------------|-----|-----------------|----------------|--------|-----|-----|
| PIC16F720 | 2048 | 128 | 18 | 2/1 | 12 | Yes | 1 | 1 |
| PIC16F721 | 4096 | 256 | 18 | 2/1 | 12 | Yes | 1 | 1 |
| PIC16LF720 | 2048 | 128 | 18 | 2/1 | 12 | Yes | 1 | 1 |
| PIC16LF721 | 4096 | 256 | 18 | 2/1 | 12 | Yes | 1 | 1 |

PIC16F720/721

Note: Pin details are subject to change.

FIGURE 1: 20-PIN DIAGRAM FOR PIC16F720/721 AND PIC16LF720/721

PDIP, SOIC, SSOP

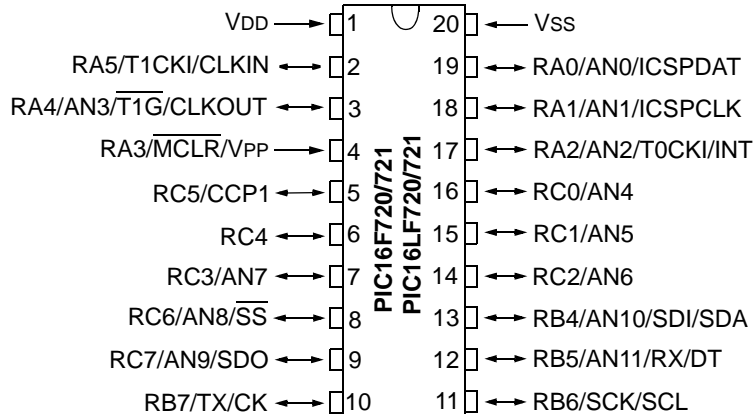


FIGURE 2: 20-PIN DIAGRAM FOR PIC16F720/721 AND PIC16LF720/721

20-Pin QFN (4x4)

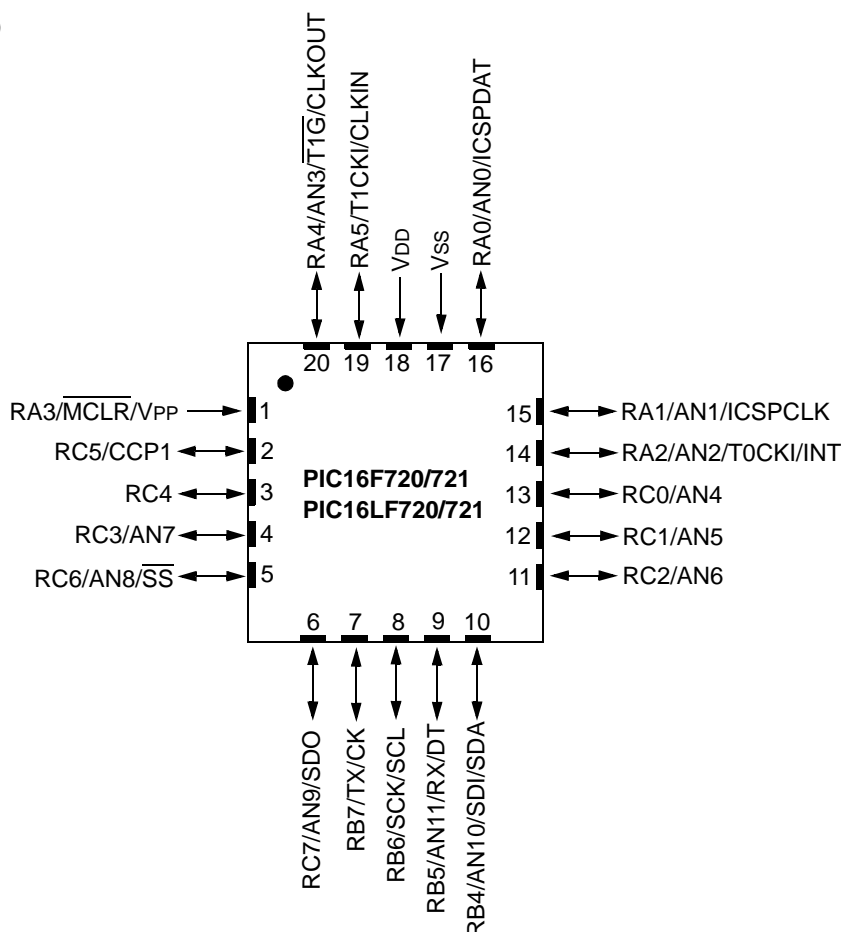


TABLE 2: 20-PIN ALLOCATION TABLE (PIC16F720/721 AND PIC16LF720/721)

| I/O | 20-Pin DIP/SOIC/ SSOP | 20-Pin QFN | A/D | Timers | CCP | AUSART | SSP | Interrupt | Pull-up | Basic |
|-----|--------------------------|------------|------|--------|------|--------|---------|-----------|---------|--------------------|
| RA0 | 19 | 16 | AN0 | — | — | — | — | IOC | Y | ICSPDAT/ ICDDAT |
| RA1 | 18 | 15 | AN1 | — | — | — | — | IOC | Y | ICSPCLK/ ICDCLK |
| RA2 | 17 | 14 | AN2 | T0CKI | — | — | — | INT/IOC | — | — |
| RA3 | 4 | 1 | — | — | — | — | — | IOC | Y | MCLR/VPP |
| RA4 | 3 | 20 | AN3 | T1G | — | — | — | IOC | Y | CLKOUT |
| RA5 | 2 | 19 | — | T1CKI | — | — | — | IOC | Y | CLKIN |
| RB4 | 13 | 10 | AN10 | — | — | — | SDI/SDA | IOC | Y | — |
| RB5 | 12 | 9 | AN11 | — | — | RX/DT | — | IOC | Y | — |
| RB6 | 11 | 8 | — | — | — | — | SCK/SCL | IOC | Y | — |
| RB7 | 10 | 7 | — | — | — | TX/CK | — | IOC | Y | — |
| RC0 | 16 | 13 | AN4 | — | — | — | — | — | — | — |
| RC1 | 15 | 12 | AN5 | — | — | — | — | — | — | — |
| RC2 | 14 | 11 | AN6 | — | — | — | — | — | — | — |
| RC3 | 7 | 4 | AN7 | — | — | — | — | — | — | — |
| RC4 | 6 | 3 | — | — | — | — | — | — | — | — |
| RC5 | 5 | 2 | — | — | CCP1 | — | — | — | — | — |
| RC6 | 8 | 5 | AN8 | — | — | — | SS | — | — | — |
| RC7 | 9 | 6 | AN9 | — | — | — | SDO | — | — | — |
| VDD | 1 | 18 | — | — | — | — | — | — | — | VDD |
| Vss | 20 | 17 | — | — | — | — | — | — | — | Vss |

PIC16F720/721

NOTES:

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