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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 "<u>Embedded -</u> <u>Microcontrollers</u>"

Details

Product Status	Active
Core Processor	PIC
Core Size	8-Bit
Speed	20MHz
Connectivity	I ² C, SPI, UART/USART
Peripherals	Brown-out Detect/Reset, POR, PWM, WDT
Number of I/O	36
Program Memory Size	14KB (8K x 14)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	368 x 8
Voltage - Supply (Vcc/Vdd)	1.8V ~ 5.5V
Data Converters	A/D 14x8b
Oscillator Type	Internal
Operating Temperature	-40°C ~ 85°C (TA)
Mounting Type	Surface Mount
Package / Case	44-TQFP
Supplier Device Package	44-TQFP (10x10)
Purchase URL	https://www.e-xfl.com/product-detail/microchip-technology/pic16f727t-i-pt

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	1	I	I			
	RD3	ST	CMOS			
	CPS11			Canacitive sensing input 11		
RD4/CPS12		<u>от</u>		Capacitive sensing input 11.		
		31	CMOS			
	CPS12	AN		Capacitive sensing input 12.		
RD5/CPS13	RD5	ST	CMOS	General purpose I/O.		
	CPS13	AN	—	Capacitive sensing input 13.		
RD6/CPS14	RD6	ST	CMOS	General purpose I/O.		
	CPS14	AN	—	Capacitive sensing input 14.		
RD7/CPS15	RD7	ST	CMOS	General purpose I/O.		
	CPS15	AN	—	Capacitive sensing input 15.		
RE0/AN5	RE0 ST CMOS General purpose I/O.		General purpose I/O.			
	AN5	AN	—	A/D Channel 5 input.		
RE1/AN6	RE1	ST	CMOS	General purpose I/O.		
	AN6	AN	-	A/D Channel 6 input.		
RE2/AN7	RE2	ST	CMOS	General purpose I/O.		
	AN7	AN	—	A/D Channel 7 input.		
RE3/MCLR/VPP RE3 TTL		—	General purpose input.			
	MCLR	ST	—	Master Clear with internal pull-up.		
	Vpp	ΗV	—	Programming voltage.		
VDD	Vdd	Power	—	Positive supply.		
Vss	Vss	Power	_	Ground reference.		
AN = Analog input or c TTL = TTL compatible i	output CMO nput ST	S = CMO = Schm	S compat hitt Trigger	ible input or output OD = Open Drain r input with CMOS levels I^2C = Schmitt Trigger input with I^2C		

HV = High Voltage XTAL = Crystal levels

The PIC16F722/3/4/6/7 devices have an internal low dropout voltage regulator. An external capacitor must be connected to one of the available VCAP pins to stabilize the regulator. For more information, see . The PIC16LF722/3/4/6/7 devices do not have the

voltage regulator and therefore no external capacitor is required.

Indirect addr.	00h	Indirect addr.	80h	Indirect addr.	100h	Indirect addr.	180h
TMR0	01h	OPTION	81h	TMR0	101h	OPTION	181h
PCL	02h	PCL	82h	PCL	102h	PCL	182h
STATUS	03h	STATUS	83h	STATUS	103h	STATUS	183h
FSR	04h	FSR	84h	FSR	104h	FSR	184h
PORTA	05h	TRISA	85h		105h	ANSELA	185h
PORTB	06h	TRISB	86h		106h	ANSELB	186h
PORTC	07h	TRISC	87h		107h		187h
PORTD	08h	TRISD	88h	CPSCON0	108h	ANSELD	188h
PORTE	09h	TRISE	89h	CPSCON1	109h	ANSELE	189h
PCLATH	0Ah	PCLATH	8Ah	PCLATH	10Ah	PCLATH	18Ah
INTCON	0Bh	INTCON	8Bh	INTCON	10Bh	INTCON	18Bh
PIR1	0Ch	PIE1	8Ch	PMDATL	10Ch	PMCON1	18Ch
PIR2	0Dh	PIE2	8Dh	PMADRL	10Dh	Reserved	18Dh
TMR1L	0Eh	PCON	8Eh	PMDATH	10Eh	Reserved	18Eh
TMR1H	0Fh	T1GCON	8Fh	PMADRH	10Fh	Reserved	18Fh
T1CON	10h	OSCCON	90h		110h		190h
TMR2	11h	OSCTUNE	91h		111h		191h
T2CON	12h	PR2	92h		112h		192h
SSPBUF	13h	SSPADD/SSPMSK	93h		113h		193h
SSPCON	14h	SSPSTAT	94h		114h		194h
CCPR1L	15h	WPUB	95h		115h		195h
CCPR1H	16h	IOCB	96h		116h		196h
CCP1CON	17h		97h		117h		197h
RCSTA	18h	TXSTA	98h		118h		198h
TXREG	19h	SPBRG	99h		119h		199h
RCREG	1Ah		9Ah		11Ah		19Ah
CCPR2L	1Bh		9Bh		11Bh		19Bh
CCPR2H	1Ch	APFCON	9Ch		11Ch		19Ch
CCP2CON	1Dh	FVRCON	9Dh		11Dh		19Dh
ADRES	1Eh		9Eh		11Eh		19Eh
ADCON0	1Fh	ADCON1	9Fh		11Fh		19Fh
	20h		A0h	General Purpose	120h		1A0h
		General		Register	12Eb		
Conorol		Purpose		TO Bytes	130h		
General		Register					
Register		80 Bytes					
96 Bytes			EFh		16Fh		1EFh
,		Accesses	F0h	Accesses	170h	Accesses	1F0h
		70h-7Fh		70h-7Fh		70h-7Fh	
	7Fh		FFh		17Fh		1FFh
Bank 0		Bank 1	-	Bank 2	-	Bank 3	_
= Unimr	lemented	data memory locatio	ns, rea	d as '0'			



FIGURE 24-51: SCHMITT TRIGGER INPUT THRESHOLD VIN vs. VDD OVER TEMPERATURE





Original release.

Electrical Specification updates; Package Drawings; miscellaneous updates.

Revised data sheet title; Revised Low-Power Features section; Revised Section 6.2.2.4 RA3/AN3/VREF; Revised Figure 16-8 Synchronous Reception.

Removed the Preliminary Label; Updated the "Electrical Characteristics" section; Added charts in the "Char. Data" section; Deleted "Based 8-Bit CMOS" from title; Updated the "Special Microcontroller Features" section; Changed the title of the "Low Power Features" section into "Extreme Low-Power Management PIC16LF72X with nanoWatt XLP" and updated this section; Inserted new section – "Analog Features" (page 1); Changed the title of the "Peripheral Features" section into "Peripheral Highlights" and updated the section.

Added paragraph to section 5.0 (LDO Voltage Regulator); Updated the Electrical Specifications section (Added another absolute Maximum Rating; Updated section 23.1 and Table 23-4); Updated the Pin Diagrams with the UQFN package; Updated Table 1, adding UQFN; Updated section 23.5 (Thermal Considerations); Updated the Packaging Information section adding the UQFN Package; Updated the Product Identification System section.

Updated Table 2; Updated 23.1, 23.3 and 9.2.4 Sections; Updated Figure 23-9; Other minor corrections.

This discusses some of the issues in migrating from other $\text{PIC}^{\textcircled{B}}$ devices to the PIC16F72X family of devices.

Max. Operating Speed	20 MHz	20 MHz	
Max. Program Memory (Words)	8K	8K	
Max. SRAM (Bytes)	368	368	
A/D Resolution	8-bit	8-bit	
Timers (8/16-bit)	2/1	2/1	
Oscillator Modes	4	8	
Brown-out Reset	Y	Y	
Internal Pull-ups	RB<7:0>	RB<7:0>	
Interrupt-on-change	RB<7:4>	RB<7:0>	
Comparator	0	0	
USART	Y	Y	
Extended WDT	N	N	
Software Control Option of WDT/BOR	Ν	N	
INTOSC Frequencies	None	500 kHz - 16 MHz	
Clock Switching	N	N	