

PIC24 MCU Peripheral Integration

Quick Reference Guide

Product Family	Maximum MHz	Program Flash Memory (KB)	RAM (KB)	Pin Count	Peripheral Function Focus																																														
					Integrated Analog			Waveform Control				Clocks and Timers			Safety and Monitoring					Communications					User Interface			Security				System Flexibility																			
					ADC (resolution) ¹	DAC (resolution) ²	HS Comp	OPA/PGA	SCCP	MCCP	PWM	MC PWM	IC and OC	PWM Resolution (ns)	16-bit/32-bit Timers	RTCC	QEI	Flash Error Correction Code	LVD	WDT	DMT	CRC	Hardware Safety Features	IEC 60730 Class B Safety	USB	CAN/CAN FD	UART	LIN	I ² C	SPI	I ² S™	CTMU and mTouch™ Sensing	LCD (Segments)	GFX	Cryptographic Engine	Secure Key Storage	RNG	CodeGuard Security - Secure Boot	Flash OTP by ICSP™ Write Inhibit	Embedded Security with ATECC608/TA100	Dual Partition Flash	CLC	PPS	PTG	DMA	DOZE, IDLE, SLEEP and PMD	XLP	VBAT			
PIC24 Family																																																			
PIC24F04KA20X ^{SV}	8	4	0.5	14–20	10		✓				✓		✓	62.5	✓				✓	✓			L1			✓	✓	✓	✓	✓	✓	✓											✓	✓							
PIC24FXXKA10X	16	8–16	1.5	20–28	10		✓				✓		✓	62.5	✓				✓	✓		✓	L2			✓	✓	✓	✓	✓	✓	✓											✓	✓							
PIC24FXXKM10X ^{SV}	16	8–16	1	20–44	12		✓		✓	✓	✓		✓	62.5	✓				✓	✓		✓	L2			✓	✓	✓	✓	✓	✓	✓								✓				✓	✓						
PIC24FXXKM20X ^{SV}	16	8–16	2	20–44	12	8	✓	✓	✓	✓	✓		✓	62.5	✓				✓	✓		✓	L2			✓	✓	✓	✓	✓	✓	✓						✓				✓	✓								
PIC24FXXKA30X ^{SV}	16	16–32	2	20–44	12		✓				✓		✓	62.5	✓				✓	✓		✓	L2			✓	✓	✓	✓	✓	✓	✓											✓	✓							
PIC24FJXXGP20X	16	32–64	8	28–48	12		✓			✓	✓		✓	15	✓	✓		✓	✓	✓	✓	✓	L3	✓		✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓						
PIC24FJXXGU20X	16	32–64	8	28–48	12		✓			✓	✓		✓	15	✓	✓		✓	✓	✓	✓	✓	L3	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓	✓	✓	✓	✓						
PIC24EPXXGP20X	70	32–512	4–48	28–64	12	4	✓	✓			✓		✓	14	✓				✓		✓	L2	✓			✓	✓	✓	✓	✓	✓	✓	✓								✓	✓	✓	✓	✓	✓					
PIC24EPXXMC20X	70	32–512	4–48	28–64	12	4	✓	✓			✓	✓	✓	7	✓	✓	✓		✓	✓		✓	L2	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓								✓	✓	✓	✓	✓	✓				
PIC24FJXXXGA20X	16	64–128	8	28–44	12		✓				✓		✓	62.5	✓	✓			✓	✓		L2	✓			✓		✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
PIC24FJXXXGB20X	16	64–128	8	28–44	12		✓				✓		✓	62.5	✓	✓			✓	✓		✓	L2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓									✓	✓	✓	✓	✓	✓	✓	✓		
PIC24FJxxxGL30x	16	64–128	8	28–64	12		✓			✓	✓		✓	15	✓	✓		✓	✓	✓	✓	✓	L3	✓		✓	✓	✓	✓	✓	✓	✓	✓	Up to 256				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
PIC24FJXXXGA3XX	16	64–128	8	64–100	12		✓				✓		✓	62.5	✓	✓			✓	✓		✓	L2	✓		✓	✓	✓	✓	✓	✓	✓	✓	Up to 480								✓	✓	✓	✓	✓	✓	✓	✓		
PIC24FJXXXGC0XX	16	64–128	8	64–100	16	10	✓				✓		✓	62.5	✓	✓			✓	✓		✓	L2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Up to 472								✓	✓	✓	✓	✓	✓	✓	✓		
PIC24FJXXXGA4XX	16	64–256	8–16	64–121	12	10	✓		✓	✓	✓		✓	15	✓	✓			✓	✓		✓	L2	✓		✓		✓	✓	✓	✓	✓	✓	Up to 512		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
PIC24FJXXXGB4XX	16	64–256	8–16	64–121	12	10	✓		✓	✓	✓		✓	15	✓	✓			✓	✓		✓	L2	✓	✓	✓		✓	✓	✓	✓	✓	✓	Up to 512		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
PIC24FJxxxGU4xx	16	128–512	32	48–100	12	10	✓			✓	✓		✓	15	✓	✓		✓	✓	✓	✓	✓	L3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Up to 480				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
PIC24FJxxxGL4xx	16	128–512	32	48–100	12	10	✓				✓		✓	15	✓	✓		✓	✓	✓	✓	✓	L3	✓		✓	✓	✓	✓	✓	✓	✓	✓	Up to 480								✓	✓	✓	✓	✓	✓	✓	✓		
PIC24FJXXXGA7XX	16	64–256	16	24–48	12		✓			✓	✓		✓	15	✓	✓			✓	✓		✓	L3	✓		✓	✓	✓	✓	✓	✓	✓	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓		
PIC24EPXXXGU81X	60	256–512	28–52	100–144	12	4	✓				✓		✓	14	✓					✓		L2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
PIC24FJXXXGA6XX	16	128–1024	32	64–100	12		✓		✓	✓	✓		✓	15	✓	✓			✓	✓		✓	L3	✓		✓		✓	✓	✓	✓	✓	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
PIC24FJXXXGB6XX	16	128–1024	32	64–100	12		✓		✓	✓	✓		✓	15	✓	✓			✓	✓		✓	L3	✓	✓	✓		✓	✓	✓	✓	✓	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

1: PIC24 MCUs offer SAR ADC, high-speed ADC and Delta-Sigma ADC

2: PIC24 MCUs offer general-purpose DAC

3: Hardware Safety Features:

L1: Includes WDT, oscillator fail-safe, illegal opcode detect, TRAP, reset trace, register lock, frequency check, CodeGuard™ security, PWM lock*

L2: Includes features of L1 + CRC

L3: Includes features of L2 + Flash ECC and/or DMT

*PWM lock available in devices with MC PWM/PWM peripheral

(5V) PIC24 MCUs with 5V operating Voltage

INTEGRATED ANALOG: Sensor Interfacing and Signal Conditioning	
ADC: Analog-to-Digital Converter	General-purpose ADC with up to 10-/12-/16-bit resolution
HS ADC: High-Speed Analog-to-Digital Converter	High-speed SAR ADC with 12-bit resolution and sampling speed of 10 Msps
$\Delta\Sigma$ ADC: Delta-Sigma Analog-to-Digital Converter	Bipolar differential inputs configurable gain integrated PGA Delta-Sigma ADC
DAC: Digital-to-Analog Converter	General-purpose DAC with resolution up to 16-bit resolution
HS Comp: High-Speed Comparator	General-purpose rail-to-rail comparator with <1 ns response time
OPA: Operational Amplifier	General-purpose op amp for internal and external signal source conditioning
WAVEFORM CONTROL: PWM Drive and Waveform Generation	
SCCP: Single Capture/Compare/PWM	Multi-purpose 16-/32-bit input capture, output compare and PWM
MCCP: Multiple Capture/Compare/PWM	Multi-purpose 16-/32-bit input capture, output compare and PWM with up to six outputs and an extended range of output control features
PWM: Pulse Width Modulation	16-bit PWM with up to nine independent time bases
MC PWM: Motor Control Pulse Width Modulation	Motor control 16-bit PWM with multiple synchronized pulse-width modulation, up to six outputs with four duty cycle generators and resolution up to 7 ns
IC: Input Capture	Input capture with an independent timer base to capture an external event
OC: Output Compare	Output compare with an independent time base to compare value with compare registers and generate a single output pulse, or a train of output pulses on a compare match event
CLOCKS AND TIMERS: Signal Measurement with Timing and Counter Control	
16-/32-bit Timer	General-purpose 16-/32-bit timer/counter with compare capability
RTCC: Real-Time Clock/Calendar	Real-time clock and calendar with a Binary-Coded Decimal (BCD) clock/calendar to maintain accurate timing with external 32/768 kHz crystal
QEI: Quadrature Encoder Interface	Quadrature encoder interface to increment encoders for obtaining mechanical position data
SAFETY AND MONITORING: Hardware Monitoring and Fault Detection	
Flash ECC: Error Correction Code	ECC detects the presence of single and double bit errors, and corrects single bit error automatically
LVD: Low-Voltage Detection	LVD detects drops in system operating voltage using an internal reference voltage for comparison, especially in battery-powered applications
WDT: Watch Dog Timer	System supervisory circuit that generates a reset when software timing anomalies are detected within a configurable critical window
DMT: Dead Man Timer	System supervisory circuit that generates a reset when instruction sequence anomalies are detected within a configurable critical window
CRC: Cyclical Redundancy Check with Memory Scan	Automatically calculates CRC checksum of Program/Data/EE memory for NVM integrity and a general-purpose 16-bit CRC for use with memory and communications data
Hardware Safety Features	Hardware Safety features include Flash error correction, RAM MBIST, backup system oscillator, WDT, DMT, CRC scan, etc.
IEC 60730 Class B Safety	IEC 60730 Functional Safety Ready Devices offers Class B safety diagnostic libraries for designing household applications

COMMUNICATIONS: General, Industrial, Lighting and Automotive	
USB OTG: Universal Serial Bus	USB 2.0 full-speed (host and device), low-speed (host) and On-The-Go (OTG) support
CAN/CAN FD: Controller Area Network	Industrial- and automotive-centric communication bus
UART: Universal Asynchronous Receiver Transceiver	General-purpose full-duplex, 8-bit or 9-bit data serial communications with optional ISO 7816 Smart Card support
LIN: Local Interconnect Network	1. Industrial- and automotive-centric communication bus 2. Support for LIN when using the EUSART
I ² C: Inter-Integrated Circuit	General purpose 2-wire inter IC serial interface for communicating with other peripherals or microcontroller devices
SPI: Serial Peripheral Interface	General-purpose 4-wire synchronous serial interface for communicating with other peripherals or microcontroller devices
I ² S: Data Converter Interface	3-wire synchronous half duplex serial interface to handle the stereo data
USER INTERFACE: Capacitive Touch Sensing and LCD Control	
CTMU and mTouch Sensing: Microchip Proprietary Capacitive Touch Technology Using Charge Time Measurement Unit	Capacitive sensing for touch buttons, sliders and system measurements and detection (e.g. water level, intrusion detection, etc.) using an analog CTMU that provides accurate differential time measurement between pulse sources and asynchronous pulse generation
LCD: Liquid Crystal Display	Highly integrated segmented LCD controller
GFX: Graphics Controller	Highly integrated graphics controller supporting direct interface with display glasses with built-in analog drive for individual pixel control
EMBEDDED SECURITY: Hardware Integrated Cryptographic Engine	
Cryptographic Engine	Independent NIST-compliant encryption and decryption engine
Secure Key Storage	Multiple option for key storage, selection and management
RNG: Random Number Generator	Hardware true random number generation
CodeGuard Security - Secure Boot	Allows devices to configure the boot segment as a read-only section of memory to protect the bootloader from modification via remote digital attacks.
Flash OTP by ICSP™ Write Inhibit	Flash OTP by ICSP™ Write Inhibit enables Flash to be configured as One-Time Programmable (OTP) memory with the ability to write and read protect the Flash memory
SYSTEM FLEXIBILITY: System Peripherals and Interconnects	
Dual Partition Flash	Dual partition Flash operation, allowing the support of robust bootloader systems and fail-safe storage of application code, with options designed to enhance code security
CLC: Configurable Logic Cell	Integrated combinational and sequential logic with custom interconnection and re-routing of digital peripherals
PPS: Peripheral Pin Select	I/O pin remapping of digital peripherals for greater design flexibility and improved EMI board layout
PTG: Peripheral Trigger Generator	User-programmable sequencer, capable of generating complex trigger signal sequences to coordinate the operation of other peripherals
DMA: Direct Memory Access	Direct memory access for transfer of data between the CPU and its peripherals without CPU assistance
DOZE, IDLE, SLEEP and PMD	Low-power saving modes
XLP: eXtreme Low Power Technology	XLP technology devices with extreme low-power operation modes for battery/low power applications
V _{BAT}	Hardware-based power mode that maintains only the most critical operations when a power loss occurs on V _{DD}

Learn more about PIC24 MCUs at www.microchip.com/PIC24.