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## 20-Pin, 8-Bit ‘Enhanced Baseline’ Microcontroller Product Brief

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### Description:

This document describes the ‘Enhanced Baseline’ device with Flash program memory self-write capability, interrupts and op amps.

### Processor Features:

- Interrupt Capability
- PIC16F527 Operating Speed:
  - DC – 20 MHz Crystal oscillator
  - DC – 200 ns Instruction cycle
- High Endurance Program and Flash Data Memory Cells:
  - 1024 x 12 user execution memory
  - 64 x 8 self-writable data memory
  - 100,000 write program memory endurance
  - 1,000,000 write Flash data memory endurance
  - Program and Flash data retention: >40 years
- General Purpose Registers (SRAM):
  - 68 x 8 for PIC16F527
- Only 36 Single-Word Instructions to Learn:
  - Added `RETURN` and `RETFIE` instructions
  - Added `MOVLB` instruction
- All Instructions are Single-Cycle except for Program Branches which are Two-Cycle
- Four-Level Deep Hardware Stack
- Direct, Indirect and Relative Addressing modes for Data and Instructions

### Peripheral Features:

- Device Features:
  - 1 Input-only pin
  - 17 I/Os
  - Individual direction control
  - High-current source/sink
- 8-Bit Real-Time Clock/Counter (TMR0) with 8-Bit Programmable Prescaler
- In-Circuit Serial Programming™ (ICSP™) via Two External Pin Connections
- Analog Comparators (CMP):
  - Two analog comparators
  - Absolute and programmable references
- Analog-to-Digital Converter (ADC):
  - 8-bit resolution
  - 8 external input channels
  - 1 internal channel to convert comparator
  - 0.6V reference input
- Operational Amplifiers (op amps):
  - 2 operational amplifiers
  - Fully-accessible visibility

### Microcontroller Features:

- Brown-out Reset (BOR)
- Power-on Reset (POR)
- Device Reset Timer (DRT)
- Watchdog Timer (WDT) with a Dedicated RC Oscillator
- Programmable Code Protection (CP)
- Power-Saving Sleep mode with Wake-up on Change Feature
- Selectable Oscillator Options:
  - INTOSC: Precision 4 or 8 MHz internal oscillator
  - EXTRC: Low-cost external RC oscillator
  - LP: Power-saving, low-frequency crystal
  - XT: Standard crystal/resonator
  - HS: High-speed crystal/resonator
  - EC: High-speed external clock
- Variety of Packaging Options:
  - 20-Lead PDIP, SOIC, SSOP, QFN

### CMOS Technology:

- Low-Power, High-Speed CMOS Flash Technology
- Fully-Static Design
- Wide Operating Voltage and Temperature Range:
  - Industrial: 2.0V to 5.5V
  - Extended: 2.0V to 5.5V
- Operating Current:
  - 170 uA @ 2V, 4 MHz, typical
  - -15 uA @ 2V, 32 kHz, typical
- Standby Current:
  - 100 nA @ 2V, typical

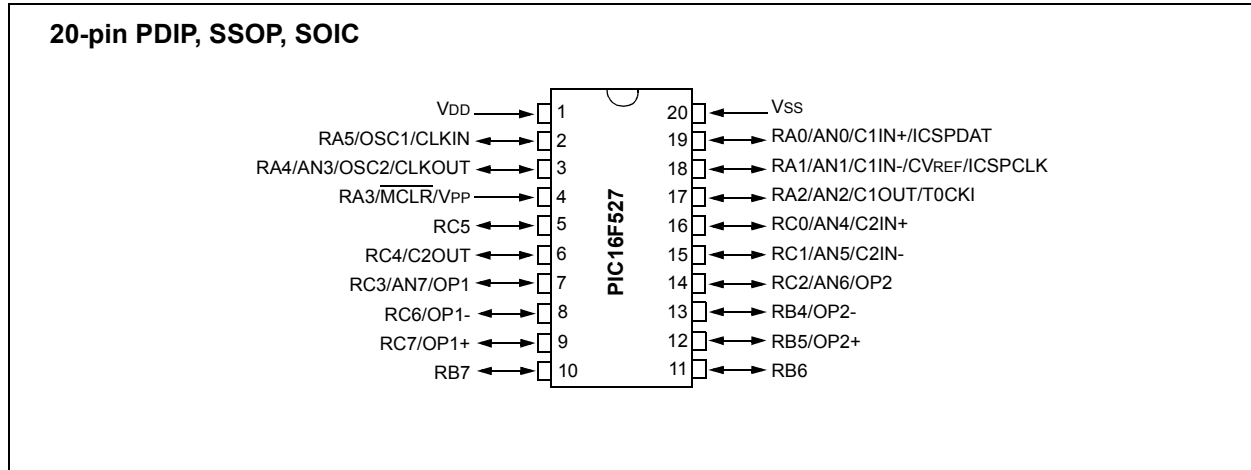
# PIC16F527

## PIC16F527 Family Types

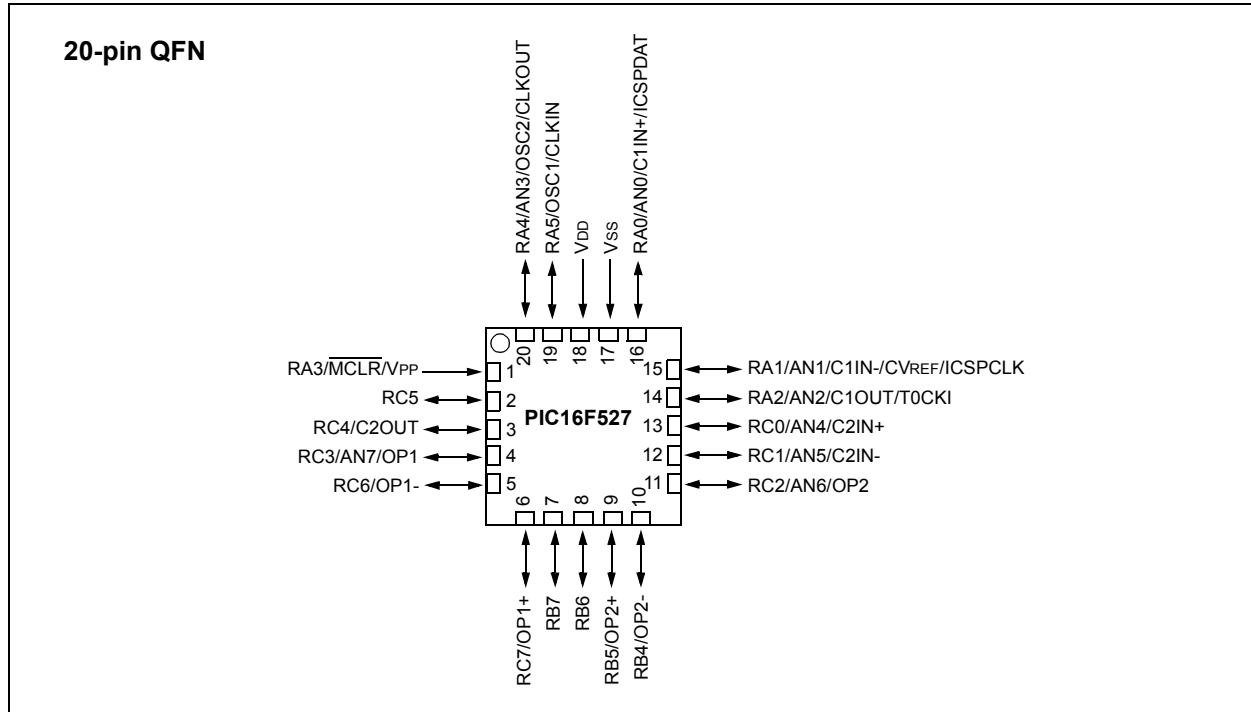
Device	Pins	Flash	Data EE (B)*	RAM (B)	8-Bit ADC Channels	Op Amp	Comparator	8-Bit Timers	BOR	Stack Levels	Interrupts	8 MHz Int. Osc.
PIC16F527	20	1KW	64	68	8	2	2	1	Y	4	Y	Y

\* 64 bytes of Flash data memory

**FIGURE 1: 20-PIN PDIP, SOIC, SSOP DIAGRAM FOR PIC16F527**



**FIGURE 2: 20-PIN QFN DIAGRAM FOR PIC16F527**



**TABLE 1: PIC16F527 PIN SUMMARY**

I/O	20-Pin PDIP/SOIC/SSOP	20-Pin QFN	Analog	Oscillator	Comparator	Reference	Timers	Op Amp	Clock Reference	ICSP™	Basic	Pull-up	Interrupt-on-Change
RA0	19	16	AN0	—	C1IN+	—	—	—	—	ICSPDAT	—	Y	Y
RA1	18	15	AN1	—	C1IN-	CVREF	—	—	—	ICSPCLK	—	Y	Y
RA2	17	14	AN2	—	C1OUT	—	TOCKI	—	—	—	—	Y	Y
RA3	4	1	—	—	—	—	—	—	—	—	MCLR VPP	Y	Y
RA4	3	20	AN3	OSC2	—	—	—	—	CLKOUT	—	—	Y	Y
RA5	2	19	—	OSC1	—	—	—	—	CLKIN	—	—	Y	Y
RB4	13	10	—	—	—	—	—	OP2-	—	—	—	—	—
RB5	12	9	—	—	—	—	—	OP2+	—	—	—	—	—
RB6	11	8	—	—	—	—	—	—	—	—	—	—	—
RB7	10	7	—	—	—	—	—	—	—	—	—	—	—
RC0	16	13	AN4	—	C2IN+	—	—	—	—	—	—	—	—
RC1	15	12	AN5	—	C2IN-	—	—	—	—	—	—	—	—
RC2	14	11	AN6	—	—	—	—	OP2	—	—	—	—	—
RC3	7	4	AN7	—	—	—	—	OP1	—	—	—	—	—
RC4	6	3	—	—	C2OUT	—	—	—	—	—	—	—	—
RC5	5	2	—	—	—	—	—	—	—	—	—	—	—
RC6	8	5	—	—	—	—	—	OP1-	—	—	—	—	—
RC7	9	6	—	—	—	—	—	OP1+	—	—	—	—	—
VDD	1	18	—	—	—	—	—	—	—	—	—	—	—
VSS	20	17	—	—	—	—	—	—	—	—	—	—	—

# PIC16F527

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## APPENDIX A: REVISION HISTORY

### Revision A (06/2012)

Initial release of this document.

### Revision B (11/2012)

Updated the Processor Features section; Added note to the Family Types table; Other minor corrections.

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