PIC16F1826/1827

18-Pin 8-Bit Flash Microcontroller Product Brief

High-Performance RISC CPU:

- Only 49 Instructions, including 14 new “C compiler-friendly” Instructions
- Operating Speed:
  - DC – 32 MHz clock input
  - DC – 125 ns instruction cycle
- Interrupt Capability with Automatic Context Saving
- 16-Level Deep Hardware Stack with Optional Overflow/Underflow Reset
- Direct, Indirect and Relative Addressing modes:
  - Two full 16-bit File Select Registers (FSRs)
  - FSRs can read program and data memory

Special Microcontroller Features:

- Precision Internal Oscillator:
  - Factory calibrated to ±1%, typical
  - Software selectable frequency range from 32 MHz to 31 kHz
- 31 kHz Low-Power Internal Oscillator
- External Oscillator Block with:
  - 4 crystal/resonator modes up to 32 MHz using 4xPLL
  - 3 external clock modes up to 32 MHz
- 4x Phase Locked Loop (PLL)
- Fail-Safe Clock Monitor
- Two-Speed Start-up
- Power-Saving Sleep mode
- Power-on Reset (POR)
- Power-up Timer (PWRT)
- Oscillator Start-up Timer (OST)
- Brown-out Reset (BOR) with Selectable Trip Point
- Extended Watch-Dog Timer (WDT)
- In-Circuit Serial Programming™ (ICSP™)
- In-Circuit Debug (ICD)
- Enhanced Low-Voltage Programming (LVP)
- Operating Voltage Range:
  - 1.8V to 3.6V (PIC16LF182X)
  - 1.8V to 5.5V (PIC16F182x)
- Programmable Code Protection
- Self-Programmable under Software Control

Low-Power Features:

- Standby Current (PIC16LF182X):
  - 100 nA @ 1.8V, typical
- Operating Current (PIC16LF182X):
  - 150 μA @ 1 MHz, 1.8V, typical
- Low-Power Watchdog Timer Current (PIC16LF182X):
  - 1.0 μA @ 1.8V, typical

Peripheral Features:

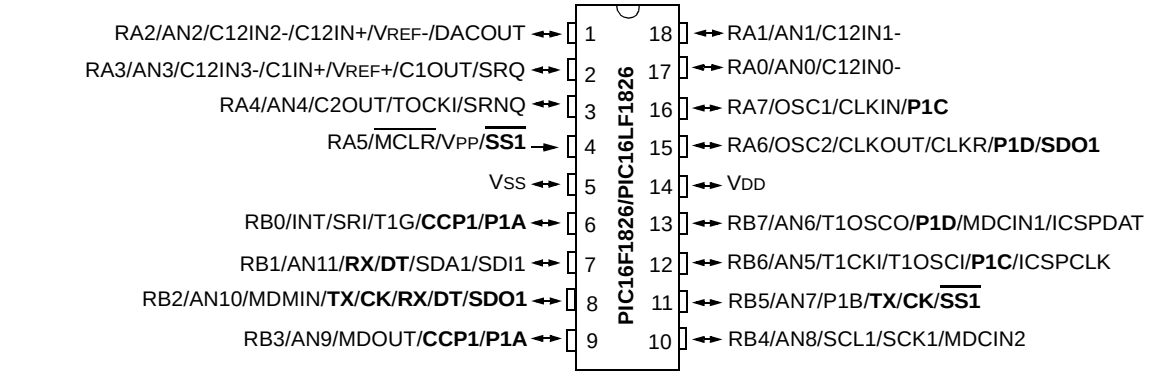
- Up to 15 I/O Pins and 1 Input-only Pin:
  - High current sink/source for LED drivers
  - Individually programmable interrupt-on-change pins
  - Individually programmable weak pull-ups
- Timer0: 8-Bit Timer/Counter with 8-Bit Programmable Prescaler
- Enhanced Timer1:
  - 16-bit timer/counter with prescaler
  - External Gate Input mode
  - Dedicated low-power 32 kHz oscillator driver
- Timer2, 4, 6: 8-Bit Timer/Counter with 8-Bit Period Register, Prescaler and Postscaler
- Up to two Enhanced Capture, Compare, PWM modules (ECCP):
  - Software selectable time bases
  - Auto-shutdown and auto-restart
  - PWM steering
- Up to two Capture/Compare/PWM modules (CCP):
  - Software selectable time bases
- Up to two Master Synchronous Serial Port (MSSP) with SPI and I^2C™ with:
  - 7-bit address masking
  - SMBus/PMBus™ compatibility
- Enhanced Universal Synchronous Asynchronous Receiver Transmitter (EUSART):
  - RS-232, RS-485 and LIN compatible
  - Auto-Baud Detect
  - Auto-wake-up on start
- SR Latch (Integrated 555 Timer):
  - Multiple Set/Reset input options
- Analog-to-Digital Converter (ADC):
  - 10-bit resolution
  - Up to 12 channels
- 2 Comparators:
  - Rail-to-rail inputs
  - Power mode control
  - Software controllable hysteresis
- Voltage Reference module:
  - Fixed Voltage Reference (FVR) with 1.024V, 2.048V and 4.096V output levels
  - 5-bit rail-to-rail resistive DAC with positive and negative reference selection
- mTouch™ Sensing oscillator module
  - Up to 12 channels for button, sensor or slider input
- Data Signal Modulator module
  - Select modulator and carrier sources from various module outputs

TABLE 1: PIC16F1826/1827/PIC16LF1826/1827 FAMILY TYPES

Device	Program Memory Flash (words)	Data EEPROM (bytes)	SRAM (bytes)	I/Os	10-bit A/D (ch)	Timers 8/16-bit	EUSART	MSSP	CCP/ ECCP	Cap Touch Channels
PIC16F1826	2048	256	256	16	12	2/1	Yes	1	0/1	12
PIC16LF1826	2048	256	256	16	12	2/1	Yes	1	0/1	12
PIC16F1827	4096	256	384	16	12	4/1	Yes	2	2/2	12
PIC16LF1827	4096	256	384	16	12	4/1	Yes	2	2/2	12

FIGURE 1: 18-PIN PDIP, SOIC PACKAGE DIAGRAM FOR PIC16F1826/PIC16LF1826

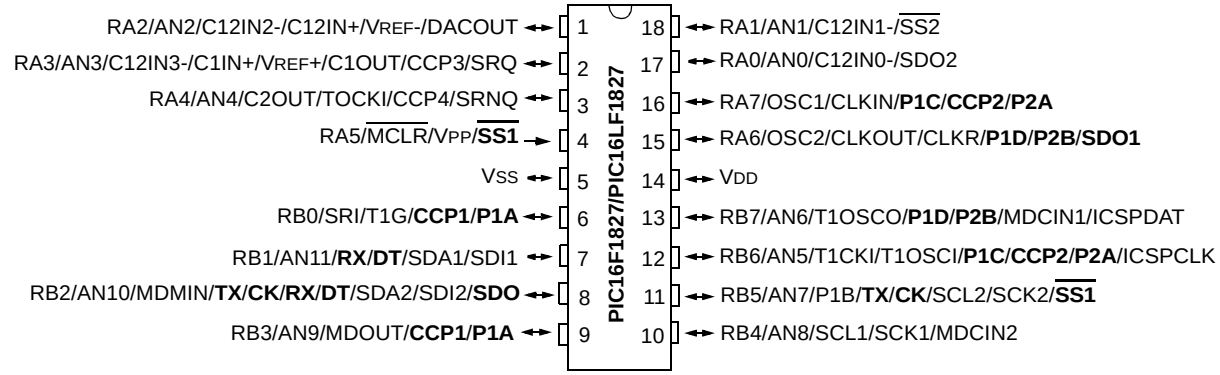
PDIP, SOIC,



Legend: Pin functions in bold can be assigned to one of two pin locations via software.

FIGURE 2: 18-PIN PDIP, SOIC PACKAGE DIAGRAM FOR PIC16F1827/PIC16LF1827

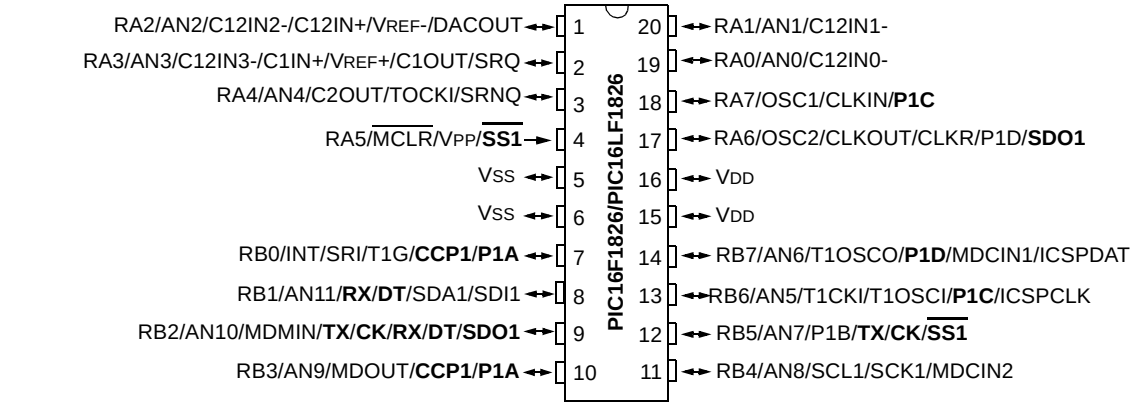
PDIP, SOIC,



Legend: Pin functions in bold can be assigned to one of two pin locations via software.

FIGURE 3: 20-PIN SSOP PACKAGE DIAGRAM FOR PIC16F1826/PIC16LF1826

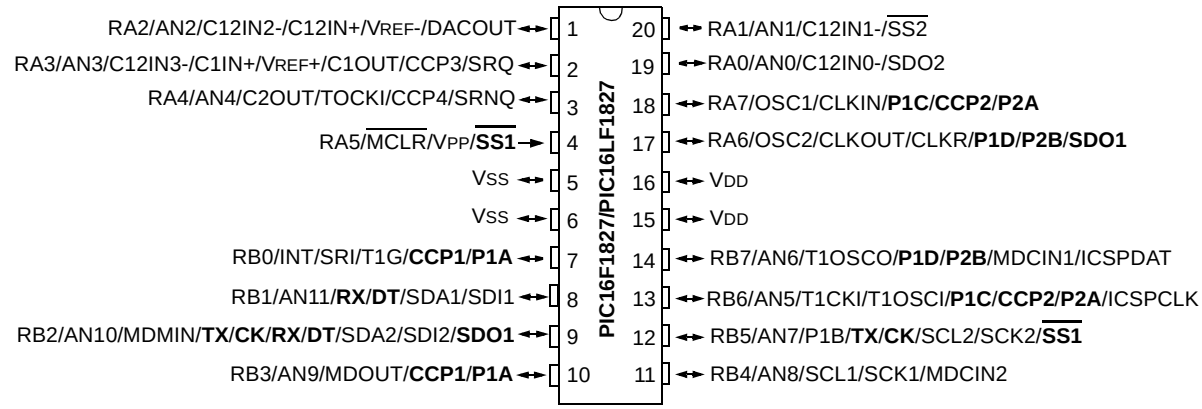
SSOP



Legend: Pin functions in bold can be assigned to one of two pin locations via software.

FIGURE 4: 20-PIN SSOP PACKAGE DIAGRAM FOR PIC16F1827/PIC16LF1827

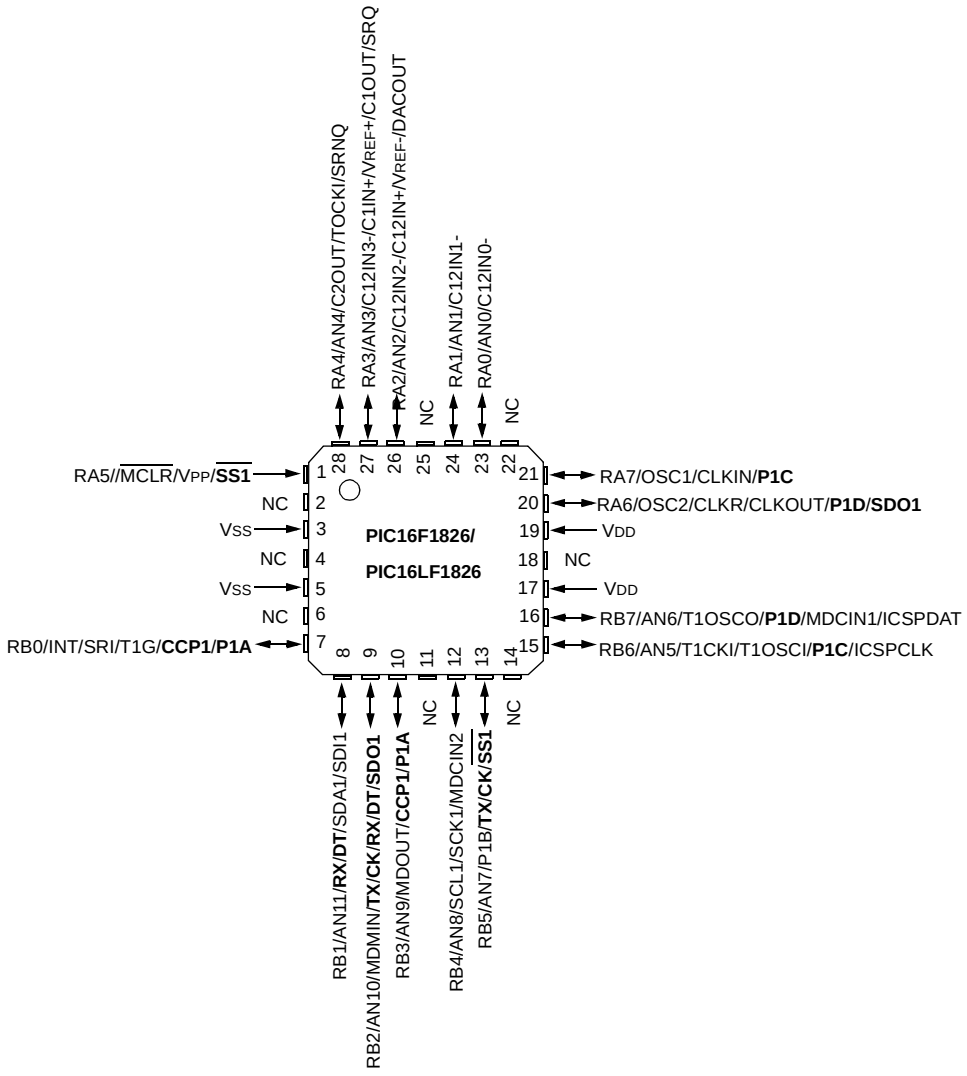
SSOP



Legend: Pin functions in bold can be assigned to one of two pin locations via software.

FIGURE 5: 28-PIN QFN PACKAGE DIAGRAM FOR PIC16F1826

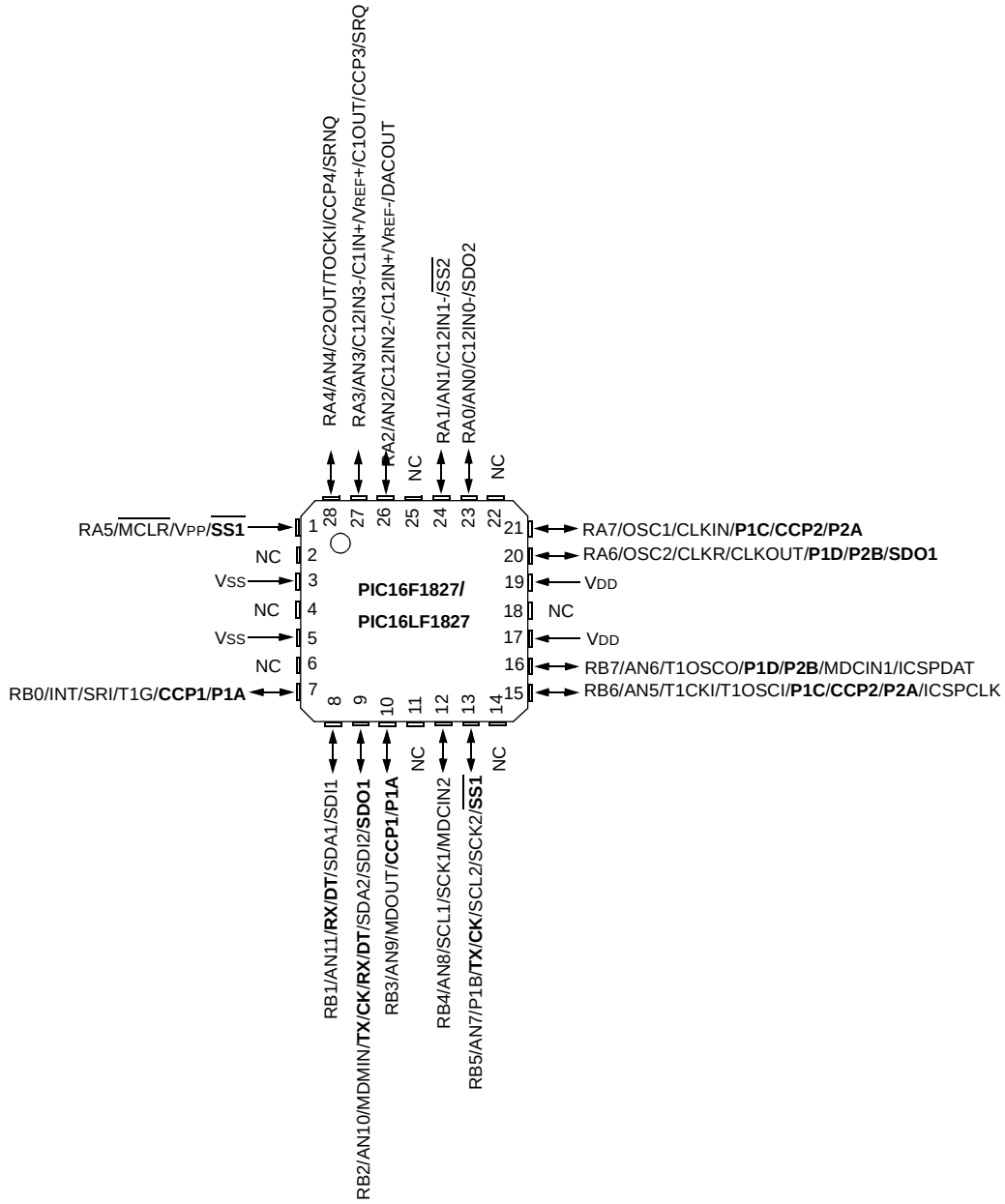
QFN



Legend: Pin functions in bold can be assigned to one of two pin locations via software.

FIGURE 6: 28-PIN QFN PACKAGE DIAGRAM FOR PIC16F1827

QFN



Legend: Pin functions in bold can be assigned to one of two pin locations via software.

TABLE 2: PIN ALLOCATION TABLE (PIC16F1826/1827)

I/O	18-Pin PDIP/SOIC	20-Pin SSOP	28-Pin QFN	A/D	Cap Sense	Comparator	SR Latch	Timers	CCP	EUSART	MSSP	Interrupt	Modulator	Pull-up	Basic
RA0	17	19	23	AN0	CPS0	C12IN0-	—	—	—	—	SDO2(2)	—	—	N	—
RA1	18	20	24	AN1	CPS1	C12IN1-	—	—	—	—	$\overline{SS2}$(2)	—	—	N	—
RA2	1	1	26	AN2	CPS2	C12IN2- C12IN+	—	—	—	—	—	—	—	N	DACOUT VREF-
RA3	2	2	27	AN3	CPS3	C12IN3- C1IN+ C1OUT	SRQ	—	CCP3(2)	—	—	—	—	N	VREF+
RA4	3	3	28	AN4	CPS4	C2OUT	SRNQ	T0CKI	CCP4(2)	—	—	—	—	N	—
RA5	4	4	1	—	—	—	—	—	—	—	$\overline{SS1}$(1)	—	—	Y	$\overline{MCLR}$ VPP
RA6	15	17	20	—	—	—		—	P1D(1) P2B(1,2)	—	SDO1(1)	—	—	N	OSC2 CLKOUT CLKR
RA7	16	18	21	—	—	—	—	—	P1C(1) CCP2(1,2) P2A(1,2)	—	—	—	—	N	OSC1 CLKIN
RB0	6	7	7	—	—	—	SRI	T1G	CCP1(1) P1A(1)	—	—	INT IOC	—	Y	—
RB1	7	8	8	AN11	CPS11	—	—	—	—	RX(1) DT(1)	SDA1 SDI1	IOC	—	Y	—
RB2	8	9	9	AN10	CPS10	—	—	—	—	RX(1) DT(1) TX(1) CK(1)	SDA2(2) SDI2(2) SDO1(1)	IOC	MDMIN	Y	—
RB3	9	10	10	AN9	CPS9	—	—	—	CCP1(1) P1A(1)	—	—	IOC	MDOUT	Y	
RB4	10	11	12	AN8	CPS8	—	—	—	—	—	SCL1 SCK1	IOC	MDCIN2	Y	—
RB5	11	12	13	AN7	CPS7	—	—	—	P1B	TX(1) CK(1)	SCL2(2) SCK2(2) $\overline{SS1}$(1)	IOC	—	Y	—
RB6	12	13	15	AN5	CPS5	—	—	T1CKI T1OSCI	P1C(1) CCP2(1,2) P2A(1,2)	—	—	IOC	—	Y	ICSPCLK
RB7	13	14	16	AN6	CPS6	—	—	T1OSCO	P1D(1) P2B(1,2)	—	—	IOC	MDCIN1	Y	ICSPDAT
VDD	14	15, 16	17, 19	—	—	—	—	—	—	—	—	—	—	—	VDD
VSS	5	5, 6	3, 5	—	—	—	—	—	—	—	—	—	—	—	VSS

Note 1: Pin functions can be assigned to one of two pin locations via software.

2: Functions are only available on the PIC16F1827 and PIC16LF1827.

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