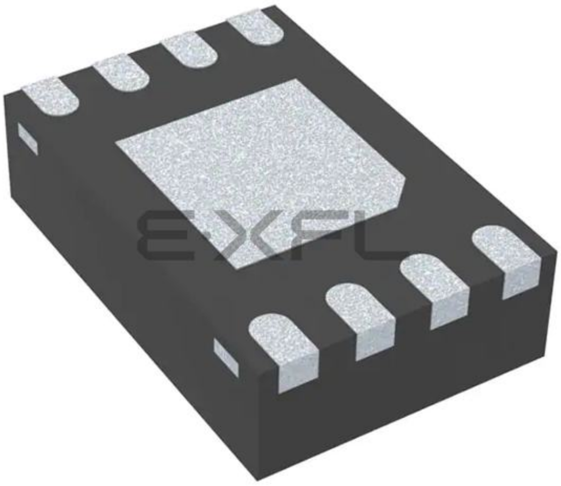
Microchip Technology - PIC10F204-E/MC Datasheet



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	4MHz
Connectivity	-
Peripherals	POR, WDT
Number of I/O	3
Program Memory Size	384B (256 x 12)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	16 x 8
Voltage - Supply (Vcc/Vdd)	2V ~ 5.5V
Data Converters	-
Oscillator Type	Internal
Operating Temperature	-40°C ~ 125°C (TA)
Mounting Type	Surface Mount
Package / Case	8-VFDFN Exposed Pad
Supplier Device Package	8-DFN (2x3)
Purchase URL	https://www.e-xfl.com/product-detail/microchip-technology/pic10f204-e-mc

Pin Diagrams

FIGURE 1: 6-PIN SOT-23

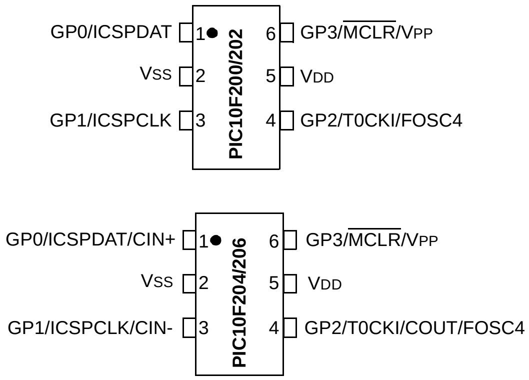


FIGURE 2: 8-PIN PDIP

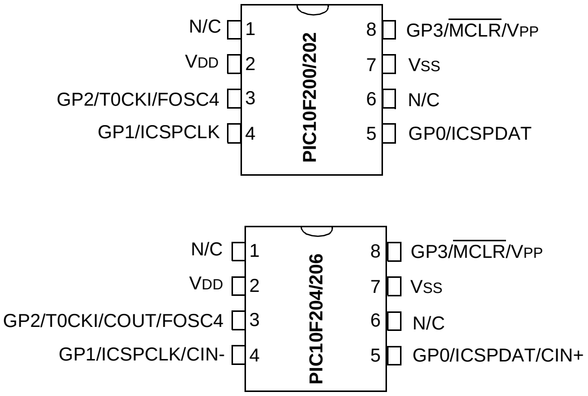


FIGURE 3: 8-PIN DFN

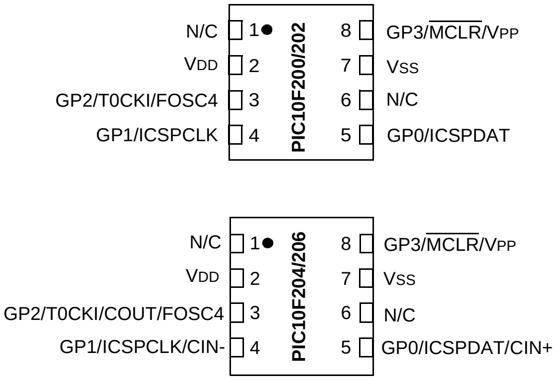


TABLE 3-2: PIC10F200/202/204/206 PINOUT DESCRIPTION

Name	Function	Input Type	Output Type	Description
GP0/ICSPDAT/CIN+	GP0	TTL	CMOS	Bidirectional I/O pin. Can be software programmed for internal weak pull-up and wake-up from Sleep on pin change.
	ICSPDAT	ST	CMOS	In-Circuit Serial Programming™ data pin.
	CIN+	AN	—	Comparator input (PIC10F204/206 only).
GP1/ICSPCLK/CIN-	GP1	TTL	CMOS	Bidirectional I/O pin. Can be software programmed for internal weak pull-up and wake-up from Sleep on pin change.
	ICSPCLK	ST	CMOS	In-Circuit Serial Programming clock pin.
	CIN-	AN	—	Comparator input (PIC10F204/206 only).
GP2/T0CKI/COUT/ FOSC4	GP2	TTL	CMOS	Bidirectional I/O pin.
	T0CKI	ST	—	Clock input to TMR0.
	COUT	—	CMOS	Comparator output (PIC10F204/206 only).
	FOSC4	—	CMOS	Oscillator/4 output.
GP3/$\overline{\text{MCLR}}$/VPP	GP3	TTL	—	Input pin. Can be software programmed for internal weak pull-up and wake-up from Sleep on pin change.
	$\overline{\text{MCLR}}$	ST	—	Master Clear (Reset). When configured as $\overline{\text{MCLR}}$, this pin is an active-low Reset to the device. Voltage on GP3/$\overline{\text{MCLR}}$/VPP must not exceed VDD during normal device operation or the device will enter Programming mode. Weak pull-up always on if configured as $\overline{\text{MCLR}}$.
	VPP	HV	—	Programming voltage input.
VDD	VDD	P	—	Positive supply for logic and I/O pins.
VSS	VSS	P	—	Ground reference for logic and I/O pins.

Legend: I = Input, O = Output, I/O = Input/Output, P = Power, — = Not used, TTL = TTL input,
ST = Schmitt Trigger input, AN = Analog input

5.0 I/O PORT

As with any other register, the I/O register(s) can be written and read under program control. However, read instructions (e.g., `MOVF GPIO, W`) always read the I/O pins independent of the pin's Input/Output modes. On Reset, all I/O ports are defined as input (inputs are at high-impedance) since the I/O control registers are all set.

5.1 GPIO

GPIO is an 8-bit I/O register. Only the low-order 4 bits are used (GP<3:0>). Bits 7 through 4 are unimplemented and read as '`0`'s. Please note that GP3 is an input-only pin. Pins GP0, GP1 and GP3 can be configured with weak pull-ups and also for wake-up on change. The wake-up on change and weak pull-up functions are not pin selectable. If GP3/$\overline{\text{MCLR}}$ is configured as $\overline{\text{MCLR}}$, weak pull-up is always on and wake-up on change for this pin is not enabled.

5.2 TRIS Registers

The Output Driver Control register is loaded with the contents of the W register by executing the `TRIS f` instruction. A '`1`' from a TRIS register bit puts the corresponding output driver in a High-Impedance mode. A '`0`' puts the contents of the output data latch on the selected pins, enabling the output buffer. The exceptions are GP3, which is input-only and the GP2/T0CKI/COUT/FOSC4 pin, which may be controlled by various registers. See Table 5-1.

Note: A read of the ports reads the pins, not the output data latches. That is, if an output driver on a pin is enabled and driven high, but the external system is holding it low, a read of the port will indicate that the pin is low.

The TRIS registers are "write-only" and are set (output drivers disabled) upon Reset.

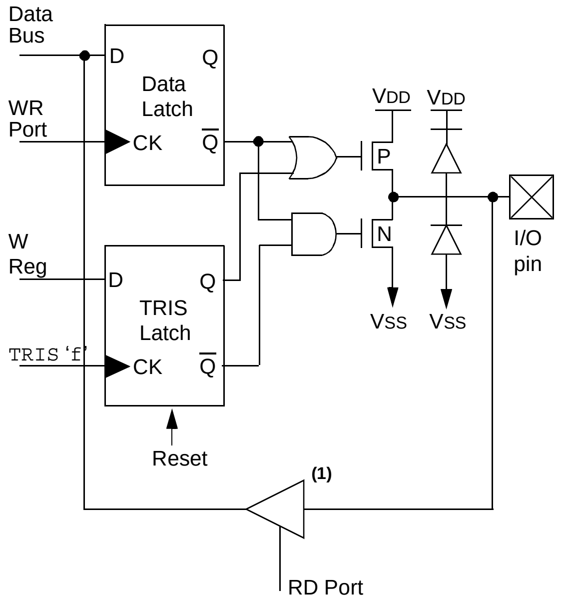
TABLE 5-1: ORDER OF PRECEDENCE FOR PIN FUNCTIONS

Priority	GP0	GP1	GP2	GP3
1	CIN+	CIN-	FOSC4	I/$\overline{\text{MCLR}}$
2	TRIS GPIO	TRIS GPIO	COUT	—
3	—	—	T0CKI	—
4	—	—	TRIS GPIO	—

5.3 I/O Interfacing

The equivalent circuit for an I/O port pin is shown in Figure 5-1. All port pins, except GP3 which is input-only, may be used for both input and output operations. For input operations, these ports are non-latching. Any input must be present until read by an input instruction (e.g., `MOVF GPIO, W`). The outputs are latched and remain unchanged until the output latch is rewritten. To use a port pin as output, the corresponding direction control bit in TRIS must be cleared (= `0`). For use as an input, the corresponding TRIS bit must be set. Any I/O pin (except GP3) can be programmed individually as input or output.

FIGURE 5-1: PIC10F200/202/204/206 EQUIVALENT CIRCUIT FOR A SINGLE I/O PIN



Note 1: See Table 3-2 for buffer type.

FIGURE 7-2: TIMER0 TIMING: INTERNAL CLOCK/NO PRESCALE

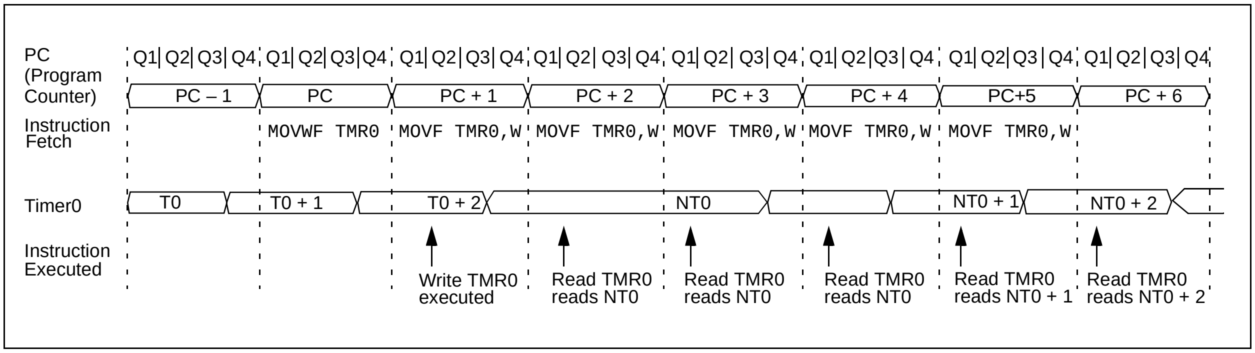


FIGURE 7-3: TIMER0 TIMING: INTERNAL CLOCK/PRESCALE 1:2

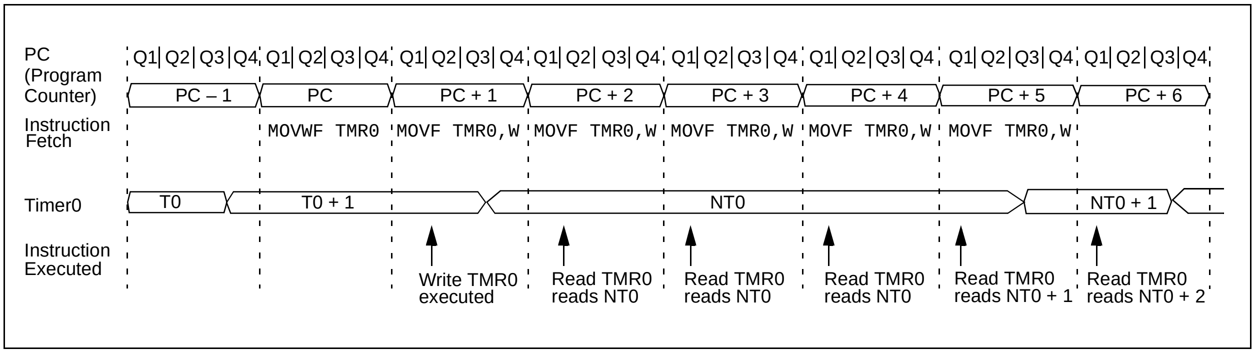


TABLE 7-1: REGISTERS ASSOCIATED WITH TIMER0

Address	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Value on Power-On Reset	Value on All Other Resets
01h	TMR0	Timer0 – 8-bit Real-Time Clock/Counter								`xxxx xxxx`	`uuuu uuuu`
07h	CMCON0	CMPOUT	COUTEN	POL	CMPT0CS	CMPON	CNREF	CPREF	CWU	`1111 1111`	`uuuu uuuu`
N/A	OPTION	GPWU	GPPU	T0CS	T0SE	PSA	PS2	PS1	PS0	`1111 1111`	`1111 1111`
N/A	TRISGPIO(1)	—	—	—	—	I/O Control Register				`---- 1111`	`---- 1111`

Legend: Shaded cells not used by Timer0. – = unimplemented, x = unknown, u = unchanged.
Note 1: The TRIS of the T0CKI pin is overridden when T0CS = `1`.

7.1 Using Timer0 with an External Clock (PIC10F204/206)

When an external clock input is used for Timer0, it must meet certain requirements. The external clock requirement is due to internal phase clock (TOSC) synchronization. Also, there is a delay in the actual incrementing of Timer0 after synchronization.

7.1.1 EXTERNAL CLOCK SYNCHRONIZATION

When no prescaler is used, the external clock input is the same as the prescaler output. The synchronization of an external clock with the internal phase clocks is accomplished by sampling the prescaler output on the Q2 and Q4 cycles of the internal phase clocks (Figure 7-4). Therefore, it is necessary for T0CKI or the comparator output to be high for at least 2 TOSC (and a small RC delay of 2 Tt0H) and low for at least 2 TOSC (and a small RC delay of 2 Tt0H). Refer to the electrical specification of the desired device.

When a prescaler is used, the external clock input is divided by the asynchronous ripple counter type prescaler, so that the prescaler output is symmetrical. For the external clock to meet the sampling requirement, the ripple counter must be taken into account. Therefore, it is necessary for T0CKI or the comparator output to have a period of at least 4 TOSC (and a small RC delay of 4 Tt0H) divided by the prescaler value. The only requirement on T0CKI or the comparator output high and low time is that they do not violate the minimum pulse width requirement of Tt0H. Refer to parameters 40, 41 and 42 in the electrical specification of the desired device.

9.2 Oscillator Configurations

9.2.1 OSCILLATOR TYPES

The PIC10F200/202/204/206 devices are offered with Internal Oscillator mode only.

- INTOSC: Internal 4 MHz Oscillator

9.2.2 INTERNAL 4 MHz OSCILLATOR

The internal oscillator provides a 4 MHz (nominal) system clock (see **Section 12.0 “Electrical Characteristics”** for information on variation over voltage and temperature).

In addition, a calibration instruction is programmed into the last address of memory, which contains the calibration value for the internal oscillator. This location is always uncode protected, regardless of the code-protect settings. This value is programmed as a `MOVLW xx` instruction where `xx` is the calibration value and is placed at the Reset vector. This will load the W register with the calibration value upon Reset and the PC will then roll over to the users program at address 0x000. The user then has the option of writing the value to the OSCCAL Register (05h) or ignoring it.

OSCCAL, when written to with the calibration value, will “trim” the internal oscillator to remove process variation from the oscillator frequency.

Note: Erasing the device will also erase the pre-programmed internal calibration value for the internal oscillator. The calibration value must be read prior to erasing the part so it can be reprogrammed correctly later.

9.3 Reset

The device differentiates between various kinds of Reset:

- Power-on Reset (POR)
- $\overline{\text{MCLR}}$ Reset during normal operation
- $\overline{\text{MCLR}}$ Reset during Sleep
- WDT time-out Reset during normal operation
- WDT time-out Reset during Sleep
- Wake-up from Sleep on pin change
- Wake-up from Sleep on comparator change

Some registers are not reset in any way, they are unknown on POR and unchanged in any other Reset. Most other registers are reset to “Reset state” on Power-on Reset (POR), $\overline{\text{MCLR}}$, WDT or Wake-up on pin change Reset during normal operation. They are not affected by a WDT Reset during Sleep or $\overline{\text{MCLR}}$ Reset during Sleep, since these Resets are viewed as resumption of normal operation. The exceptions to this are $\overline{\text{TO}}$, $\overline{\text{PD}}$, GPWUF and CWUF bits. They are set or cleared differently in different Reset situations. These bits are used in software to determine the nature of Reset. See Table 9-1 for a full description of Reset states of all registers.

TABLE 9-1: RESET CONDITIONS FOR REGISTERS – PIC10F200/202/204/206

Register	Address	Power-on Reset	$\overline{\text{MCLR}}$ Reset, WDT Time-out, Wake-up On Pin Change, Wake on Comparator Change
W	—	qqqq qqqu(1)	qqqq qqqu(1)
INDF	00h	xxxx xxxx	uuuu uuuu
TMR0	01h	xxxx xxxx	uuuu uuuu
PCL	02h	1111 1111	1111 1111
STATUS	03h	00-1 1xxx	q00q quuu(2)
STATUS(3)	03h	00-1 1xxx	qq0q quuu(2)
FSR	04h	111x xxxx	111u uuuu
OSCCAL	05h	1111 1110	uuuu uuuu
GPIO	06h	---- xxxx	---- uuuu
CMCON(3)	07h	1111 1111	uuuu uuuu
OPTION	—	1111 1111	1111 1111
TRISGPIO	—	---- 1111	---- 1111

Legend: u = unchanged, x = unknown, – = unimplemented bit, read as ‘0’, q = value depends on condition.
Note 1: Bits <7:2> of W register contain oscillator calibration values due to `MOVLW XX` instruction at top of memory.
2: See Table 9-2 for Reset value for specific conditions.
3: PIC10F204/206 only.

TRIS	**Load TRIS Register**
Syntax:	[*label*] TRIS f
Operands:	f = 6
Operation:	(W) → TRIS register f
Status Affected:	None
Description:	TRIS register ‘f’ (f = 6 or 7) is loaded with the contents of the W register

XORLW	**Exclusive OR literal with W**
Syntax:	[*label*] XORLW k
Operands:	$0 \le k \le 255$
Operation:	(W) .XOR. k → (W)
Status Affected:	Z
Description:	The contents of the W register are XOR’ed with the 8-bit literal ‘k’. The result is placed in the W register.

XORWF	**Exclusive OR W with f**
Syntax:	[*label*] XORWF f,d
Operands:	$0 \le f \le 31$ $d \in [0,1]$
Operation:	(W) .XOR. (f) → (dest)
Status Affected:	Z
Description:	Exclusive OR the contents of the W register with register ‘f’. If ‘d’ is ‘0’, the result is stored in the W register. If ‘d’ is ‘1’, the result is stored back in register ‘f’.

11.11 Demonstration/Development Boards, Evaluation Kits, and Starter Kits

A wide variety of demonstration, development and evaluation boards for various PIC MCUs and dsPIC DSCs allows quick application development on fully functional systems. Most boards include prototyping areas for adding custom circuitry and provide application firmware and source code for examination and modification.

The boards support a variety of features, including LEDs, temperature sensors, switches, speakers, RS-232 interfaces, LCD displays, potentiometers and additional EEPROM memory.

The demonstration and development boards can be used in teaching environments, for prototyping custom circuits and for learning about various microcontroller applications.

In addition to the PICDEM™ and dsPICDEM™ demonstration/development board series of circuits, Microchip has a line of evaluation kits and demonstration software for analog filter design, KEELOQ® security ICs, CAN, IrDA®, PowerSmart battery management, SEEVAL® evaluation system, Sigma-Delta ADC, flow rate sensing, plus many more.

Also available are starter kits that contain everything needed to experience the specified device. This usually includes a single application and debug capability, all on one board.

Check the Microchip web page (www.microchip.com) for the complete list of demonstration, development and evaluation kits.

11.12 Third-Party Development Tools

Microchip also offers a great collection of tools from third-party vendors. These tools are carefully selected to offer good value and unique functionality.

- Device Programmers and Gang Programmers from companies, such as SoftLog and CCS
- Software Tools from companies, such as Gimpel and Trace Systems
- Protocol Analyzers from companies, such as Saleae and Total Phase
- Demonstration Boards from companies, such as MikroElektronika, Digilent® and Olimex
- Embedded Ethernet Solutions from companies, such as EZ Web Lynx, WIZnet and IPLogika®

12.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings[†]

Ambient temperature under bias	-40°C to +125°C
Storage temperature	-65°C to +150°C
Voltage on V_{DD} with respect to V_{SS}	0 to +6.5V
Voltage on $\overline{MCLR}$ with respect to V_{SS}	0 to +13.5V
Voltage on all other pins with respect to V_{SS}	-0.3V to (V_{DD} + 0.3V)
Total power dissipation(1)	800 mW
Max. current out of V_{SS} pin	80 mA
Max. current into V_{DD} pin	80 mA
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{DD}$)	±20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{DD}$)	±20 mA
Max. output current sunk by any I/O pin	25 mA
Max. output current sourced by any I/O pin	25 mA
Max. output current sourced by I/O port	75 mA
Max. output current sunk by I/O port	75 mA

Note 1: Power dissipation is calculated as follows: $P_{DIS} = V_{DD} \times \{I_{DD} - \sum I_{OH}\} + \sum \{(V_{DD} - V_{OH}) \times I_{OH}\} + \sum (V_{OL} \times I_{OL})$

> †NOTICE: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

12.2 DC Characteristics: PIC10F200/202/204/206 (Extended)

DC CHARACTERISTICS			Standard Operating Conditions (unless otherwise specified) Operating Temperature -40°C ≤ TA ≤ +125°C (extended)				
Param. No.	**Sym.**	**Characteristic**	**Min.**	**Typ.[1]**	**Max.**	**Units**	**Conditions**
D001	VDD	**Supply Voltage**	2.0		5.5	V	See Figure 12-1
D002	VDR	**RAM Data Retention Voltage[2]**	1.5*		—	V	Device in Sleep mode
D003	VPOR	**VDD Start Voltage** to ensure Power-on Reset	—	Vss	—	V	
D004	SVDD	**VDD Rise Rate** to ensure Power-on Reset	0.05*	—	—	V/ms	
D010	IDD	**Supply Current[3]**					
			— —	175 0.63	275 1.1	μA mA	VDD = 2.0V VDD = 5.0V
D020	IPD	**Power-down Current[4]**					
			— —	0.1 0.35	9 15	μA μA	VDD = 2.0V VDD = 5.0V
D022	IWDT	**WDT Current[5]**					
			— —	1.0 7	18 22	μA μA	VDD = 2.0V VDD = 5.0V
D023	ICMP	**Comparator Current[5]**					
			— —	12 42	27 85	μA μA	VDD = 2.0V VDD = 5.0V
D024	VREF	**Internal Reference Current[5,6]**					
			—	85 175	120 200	μA μA	VDD = 2.0V VDD = 5.0V

* These parameters are characterized but not tested.

Note 1: Data in the Typical ("Typ.") column is based on characterization results at 25°C. This data is for design guidance only and is not tested.

2: This is the limit to which VDD can be lowered in Sleep mode without losing RAM data.

3: The supply current is mainly a function of the operating voltage and frequency. Other factors such as bus loading, bus rate, internal code execution pattern and temperature also have an impact on the current consumption.

a) The test conditions for all IDD measurements in active operation mode are: All I/O pins tri-stated, pulled to VSS, T0CKI = VDD, $\overline{\text{MCLR}}$ = VDD; WDT enabled/disabled as specified.

b) For standby current measurements, the conditions are the same, except that the device is in Sleep mode.

4: Power-down current is measured with the part in Sleep mode, with all I/O pins in high-impedance state and tied to VDD or VSS.

5: The peripheral current is the sum of the base IDD or IPD and the additional current consumed when this peripheral is enabled.

6: Measured with the Comparator enabled.

12.4 Timing Parameter Symbology and Load Conditions – PIC10F200/202/204/206

The timing parameter symbols have been created following one of the following formats:

1. TppS2ppS
2. TppS

T			
F	Frequency	T	Time

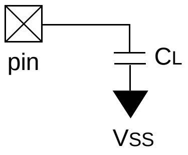
Lowercase subscripts (pp) and their meanings:

pp			
2	to	mc	$\overline{\text{MCLR}}$
ck	CLKOUT	osc	Oscillator
cy	Cycle time	t0	T0CKI
drt	Device Reset Timer	wdt	Watchdog Timer
io	I/O port	wdt	Watchdog Timer

Uppercase letters and their meanings:

S			
F	Fall	P	Period
H	High	R	Rise
I	Invalid (high-impedance)	V	Valid
L	Low	Z	High-impedance

FIGURE 12-2: LOAD CONDITIONS – PIC10F200/202/204/206



Legend:
C_L = 50 pF for all pins

TABLE 12-3: CALIBRATED INTERNAL RC FREQUENCIES – PIC10F200/202/204/206

AC CHARACTERISTICS			Standard Operating Conditions (unless otherwise specified) Operating Temperature -40°C ≤ TA ≤ +85°C (industrial), -40°C ≤ TA ≤ +125°C (extended) Operating Voltage VDD range is described in **Section 12.1 “DC Characteristics: PIC10F200/202/204/206 (Industrial)”**					
Param. No.	**Sym.**	**Characteristic**	**Freq. Tolerance**	**Min.**	**Typ.†**	**Max.**	**Units**	**Conditions**
F10	FOSC	Internal Calibrated INTOSC Frequency[1,2]	± 1%	3.96	4.00	4.04	MHz	VDD=3.5V @ 25°C
			± 2%	3.92	4.00	4.08	MHz	2.5V ≤ VDD ≤ 5.5V 0°C ≤ TA ≤ +85°C (industrial)
			± 5%	3.80	4.00	4.20	MHz	2.0V ≤ VDD ≤ 5.5V -40°C ≤ TA ≤ +85°C (industrial) -40°C ≤ TA ≤ +125°C (extended)

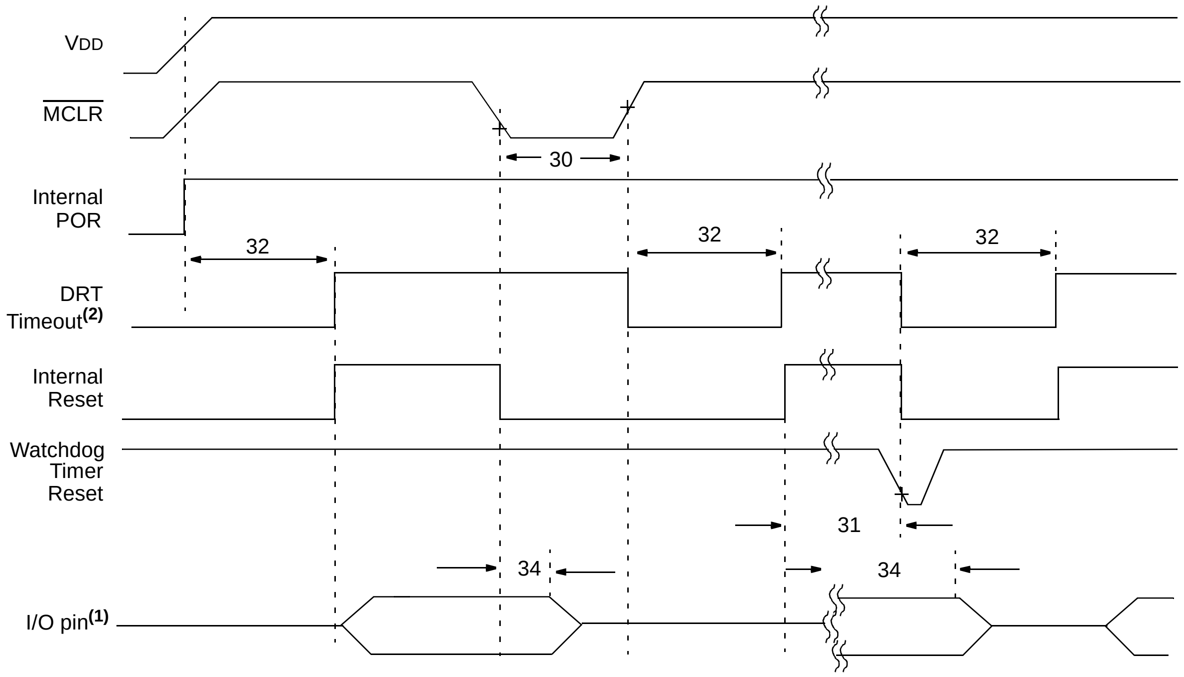
* These parameters are characterized but not tested.

† Data in the Typical (“Typ.”) column is at 5V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: To ensure these oscillator frequency tolerances, VDD and VSS must be capacitively decoupled as close to the device as possible. 0.1 µF and 0.01 µF values in parallel are recommended.

2: Under stable VDD conditions.

FIGURE 12-3: RESET, WATCHDOG TIMER AND DEVICE RESET TIMER TIMING – PIC10F200/202/204/206



Note 1: I/O pins must be taken out of High-Impedance mode by enabling the output drivers in software.

2: Runs on POR only.

FIGURE 13-2: TYPICAL IPD vs. VDD (SLEEP MODE, ALL PERIPHERALS DISABLED)

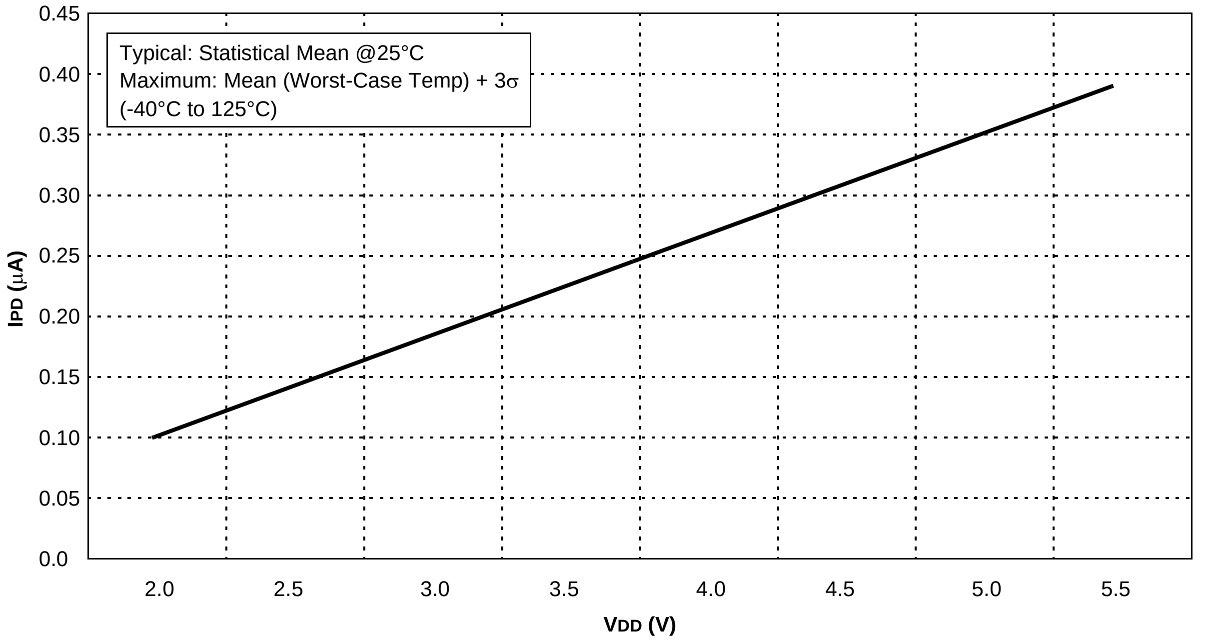


FIGURE 13-3: MAXIMUM IPD vs. VDD (SLEEP MODE, ALL PERIPHERALS DISABLED)

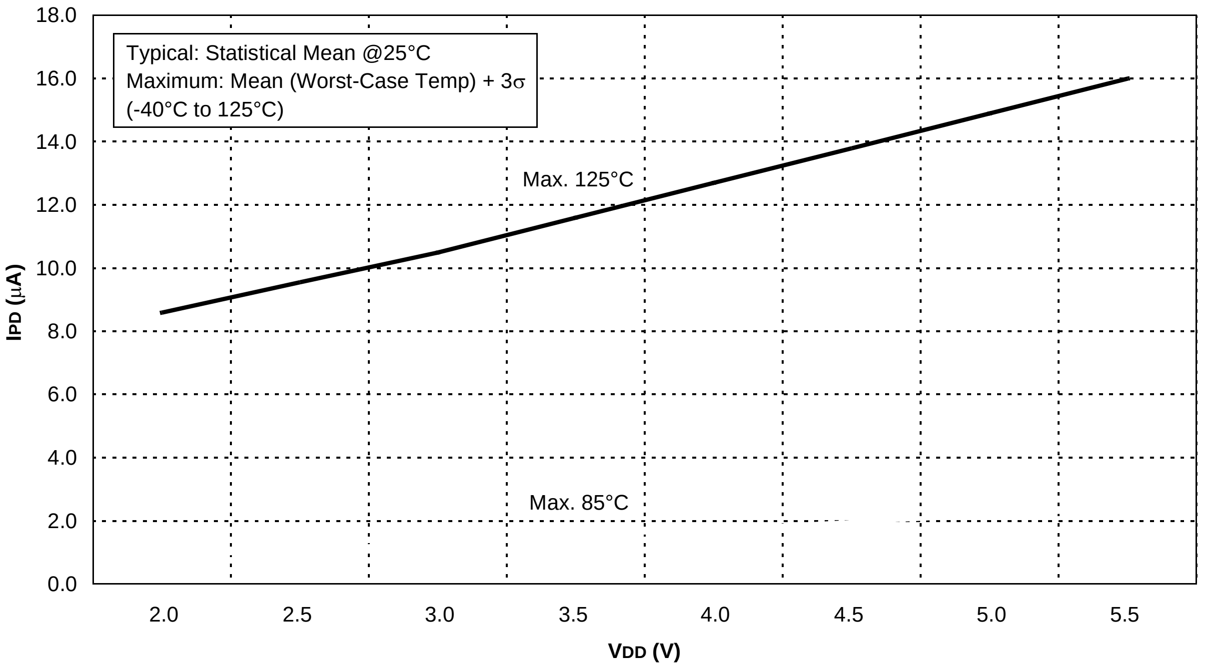


FIGURE 13-4: COMPARATOR IPD VS. VDD (COMPARATOR ENABLED)

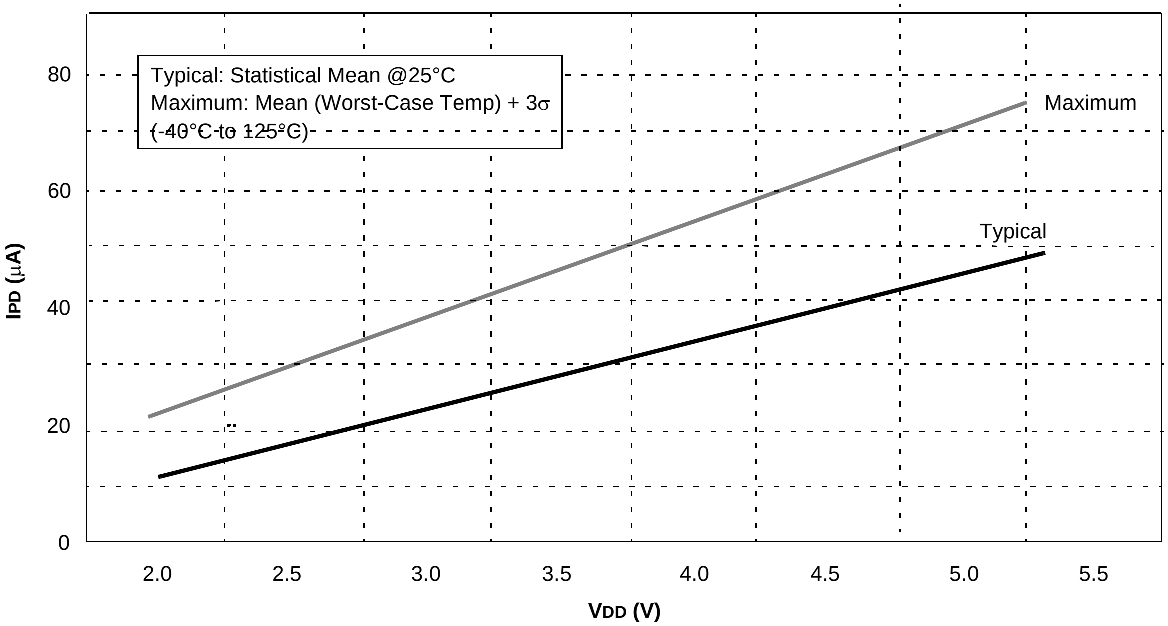


FIGURE 13-5: TYPICAL WDT IPD VS. VDD

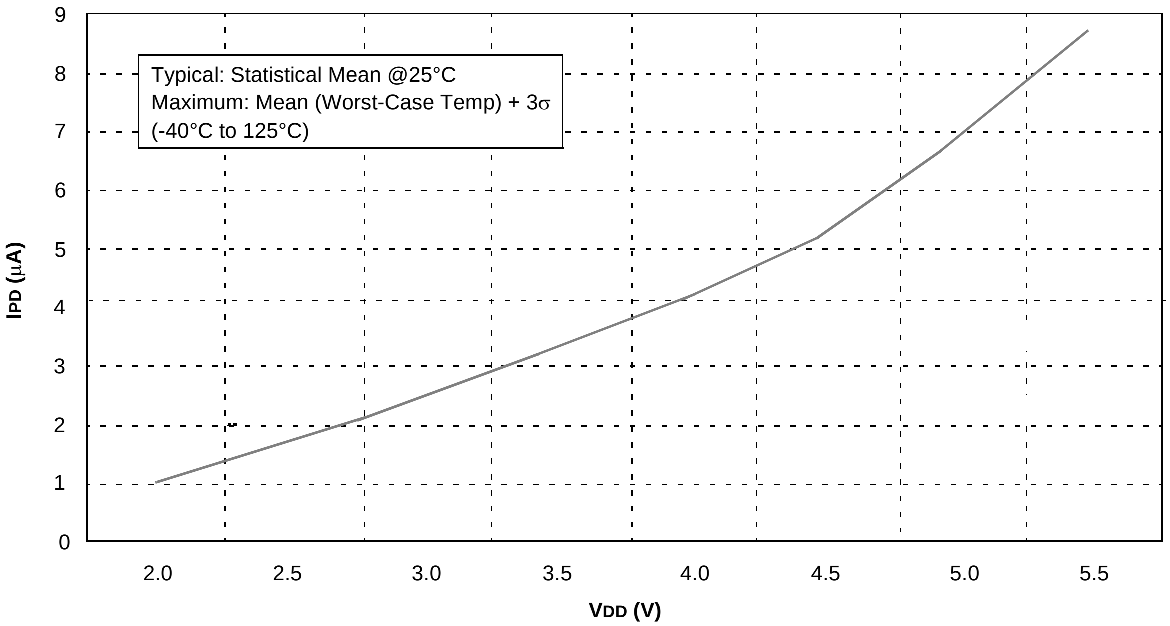


FIGURE 13-6: MAXIMUM WDT IPD vs. VDD OVER TEMPERATURE

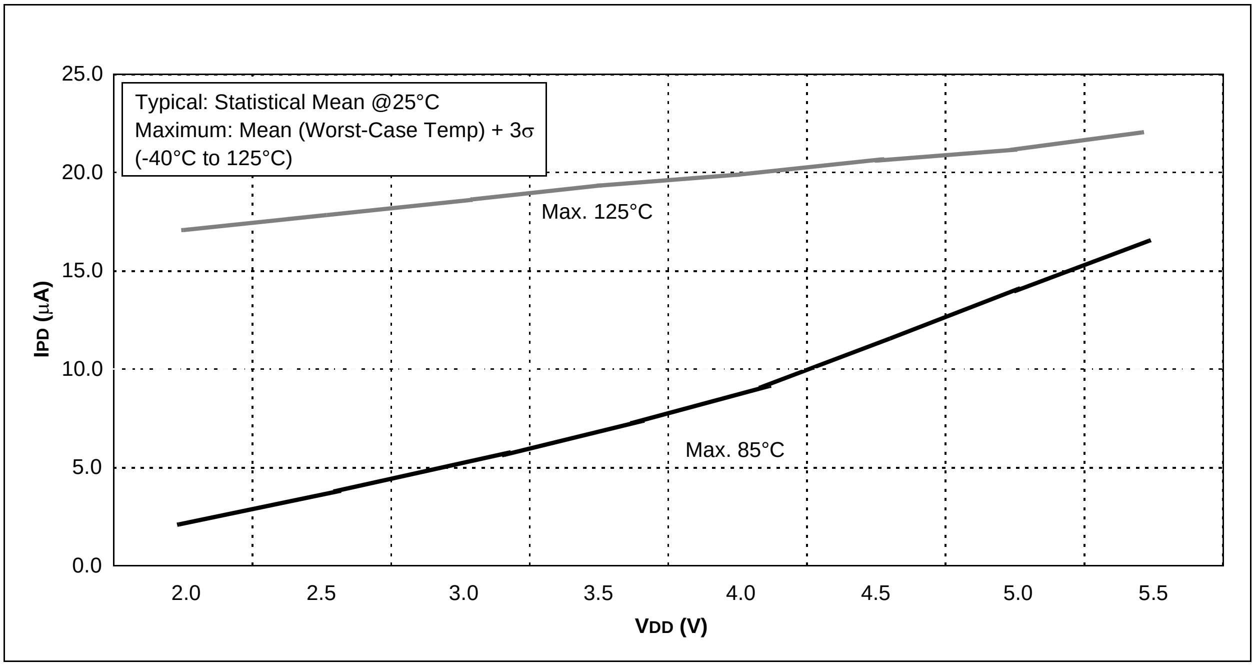
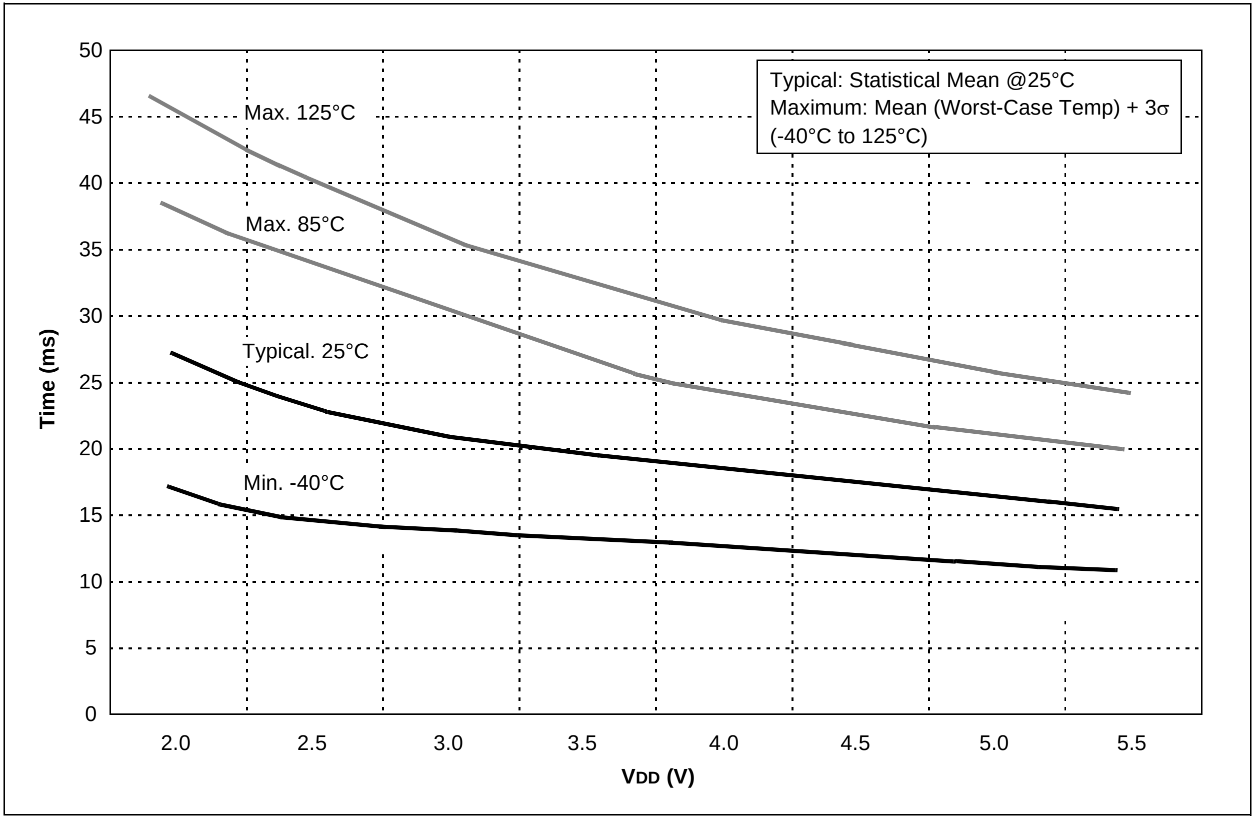
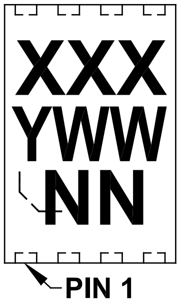


FIGURE 13-7: WDT TIME-OUT vs. VDD OVER TEMPERATURE (NO PRESCALER)



Package Marking Information (Continued)

8-Lead DFN (2x3x0.9 mm)



Example

Legend:		
	XX...X	Customer-specific information
	Y	Year code (last digit of calendar year)
	YY	Year code (last 2 digits of calendar year)
	WW	Week code (week of January 1 is week ‘01’)
	NNN	Alphanumeric traceability code
	e3	Pb-free JEDEC® designator for Matte Tin (Sn)
	*	This package is Pb-free. The Pb-free JEDEC designator (e3) can be found on the outer packaging for this package.

Note: In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information.

* Standard PIC® device marking consists of Microchip part number, year code, week code, and traceability code. For PIC device marking beyond this, certain price adders apply. Please check with your Microchip Sales Office. For QTP devices, any special marking adders are included in QTP price.

TABLE 14-1: 8-LEAD 2x3 DFN (MC) PACKAGE TOP MARKING

Part Number	Marking
PIC10F200-I/MC	BA0
PIC10F200-E/MC	BB0
PIC10F202-I/MC	BC0
PIC10F202-E/MC	BD0
PIC10F204-I/MC	BE0
PIC10F204-E/MC	BF0
PIC10F206-I/MC	BG0
PIC10F206-E/MC	BH0

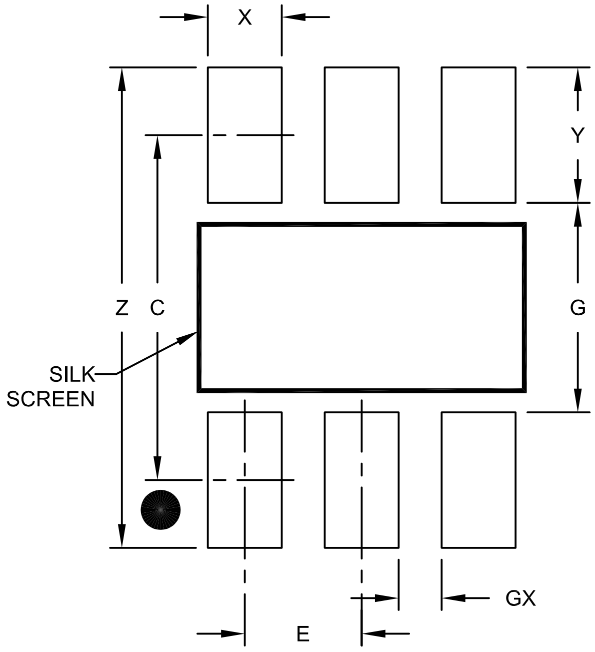
TABLE 14-2: 6-LEAD SOT-23 (OT) PACKAGE TOP MARKING

Part Number	Marking
PIC10F200-I/OT	00NN
PIC10F200-E/OT	00NN
PIC10F202-I/OT	02NN
PIC10F202-E/OT	02NN
PIC10F204-I/OT	04NN
PIC10F204-E/OT	04NN
PIC10F206-I/OT	06NN
PIC10F206-E/OT	06NN

Note: NN represents the alphanumeric traceability code.

6-Lead Plastic Small Outline Transistor (OT) [SOT-23]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



RECOMMENDED LAND PATTERN

	Units	MILLIMETERS		
	Dimension Limits	MIN	NOM	MAX
Contact Pitch	E	0.95 BSC		
Contact Pad Spacing	C		2.80	
Contact Pad Width (X6)	X			0.60
Contact Pad Length (X6)	Y			1.10
Distance Between Pads	G	1.70		
Distance Between Pads	GX	0.35		
Overall Width	Z			3.90

Notes:

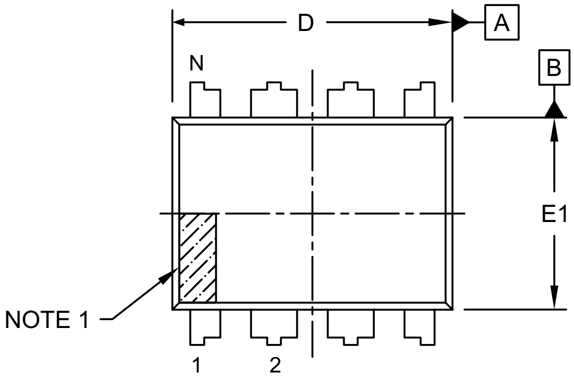
1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

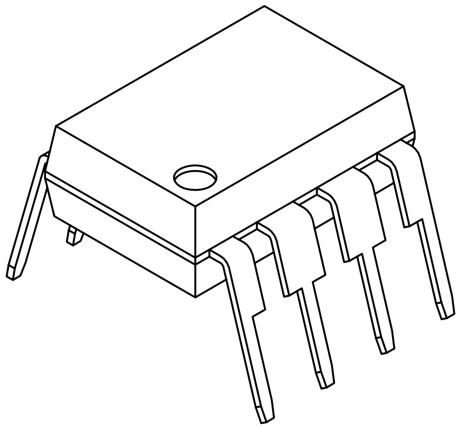
Microchip Technology Drawing No. C04-2028A

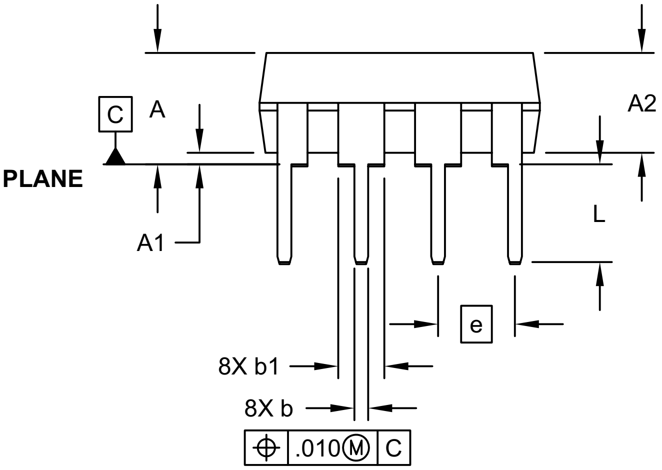
8-Lead Plastic Dual In-Line (P) - 300 mil Body [PDIP]

Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging

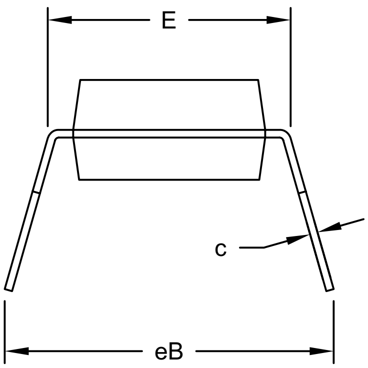


TOP VIEW





SIDE VIEW



END VIEW

Microchip Technology Drawing No. C04-018D Sheet 1 of 2

APPENDIX A: REVISION HISTORY

Revision C (August 2006)

Added 8-Pin DFN Pin Diagram; Revised Table 1-1; Reformatted all Registers; Revised Section 4.8 and added note; Section 5.3 (changed Figure reference to Figure 5-1); Tables 6-1 and 7-1 (removed shading from TRISGPIO (I/O Control Register); Sections 8.1-8.4 (changed Table reference to Table 12-2); Section 14.1 Revised and replaced Package Marking Information and drawings, Added Tables 14-1 & 14-2, Added DFN Package drawing.

Revision D (April 2007)

Revised section 12.1, 12.2, 12.3, Table 1-1, 12-1, 12-3, 12-4. Added Section 13.0. Replaced Package Drawings (Rev. AP); Removed instances of PICmicro® and replaced it with PIC®.

Revision E (October 2013)

Revised Figure 8-1 (deleted OSCCAL); Revised Packaging Legend.

Revision F (September 2014)

Added Table 12-6 (Thermal Considerations); Updated Register 4-1, Register 9-1 and Chapter 14 (Packaging Information); Other minor corrections.

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