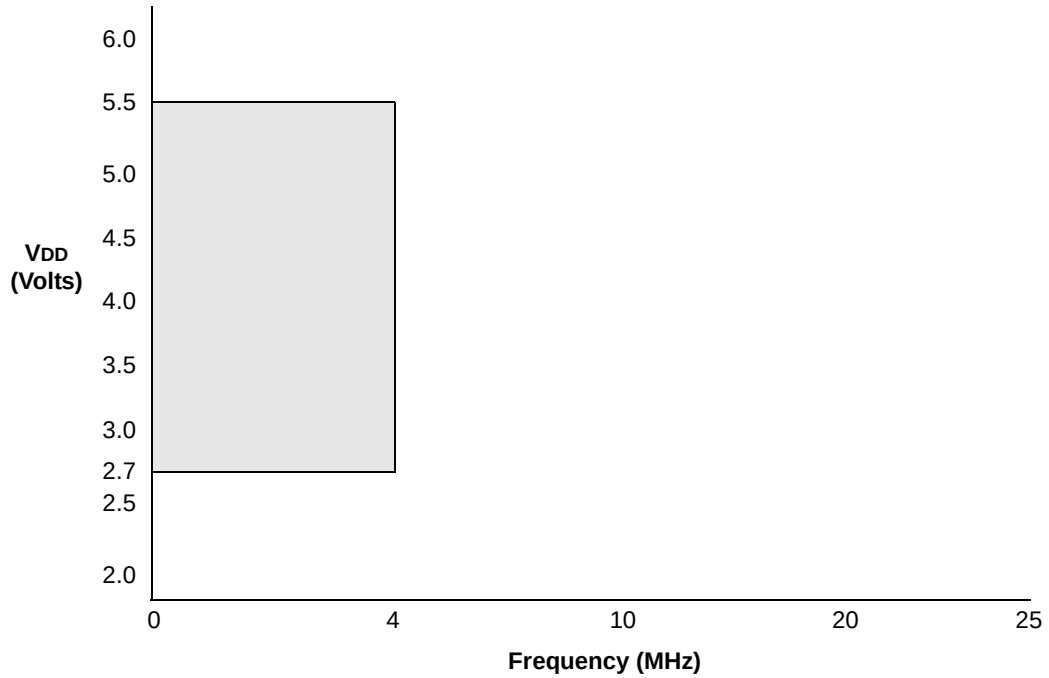
PIC16C62X

PIC16C62XA/CR62XA/CE62XA Rev. A Silicon/Data Sheet Errata

The PIC16C62X (Rev. A) parts you have received conform functionally to the Device Data Sheet (DS30235**J** for PIC16C62XA and PIC16CR62XA, or DS40182**C** for PIC16CE62X), except for the anomalies described below.

All the problems listed here will be addressed in future revisions of the **PIC16C62X silicon**.

FIGURE 1: PIC16LC62XA VOLTAGE-FREQUENCY GRAPH, -40°C ≤ TA ≤ 0°C

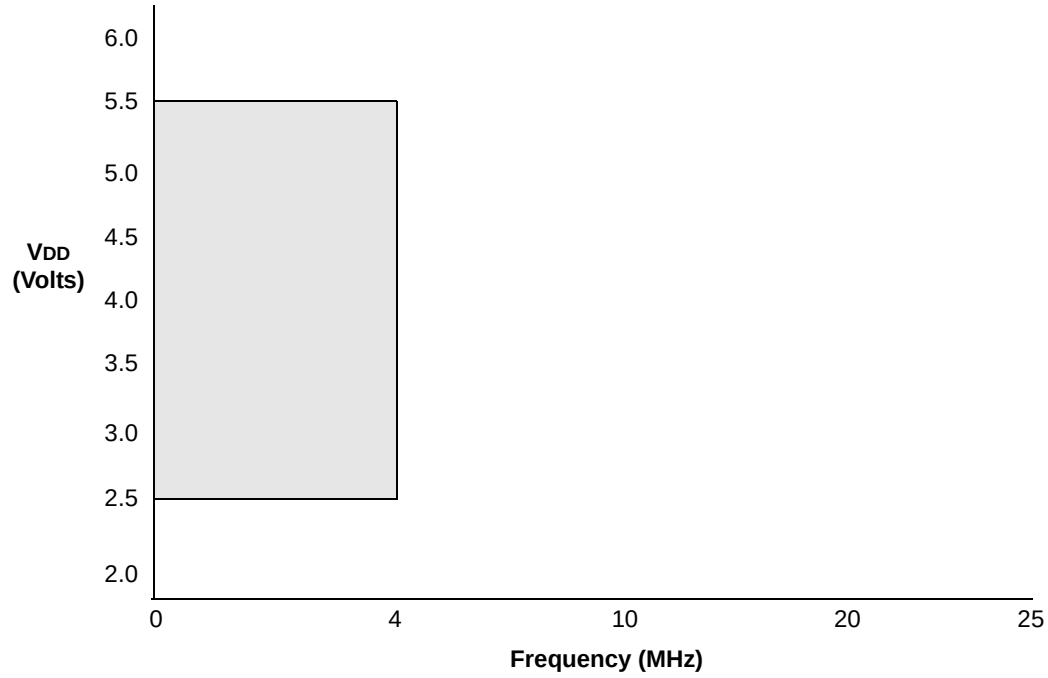


Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

Note: As with any windowed EPROM device, please cover the window at all times, except when erasing.

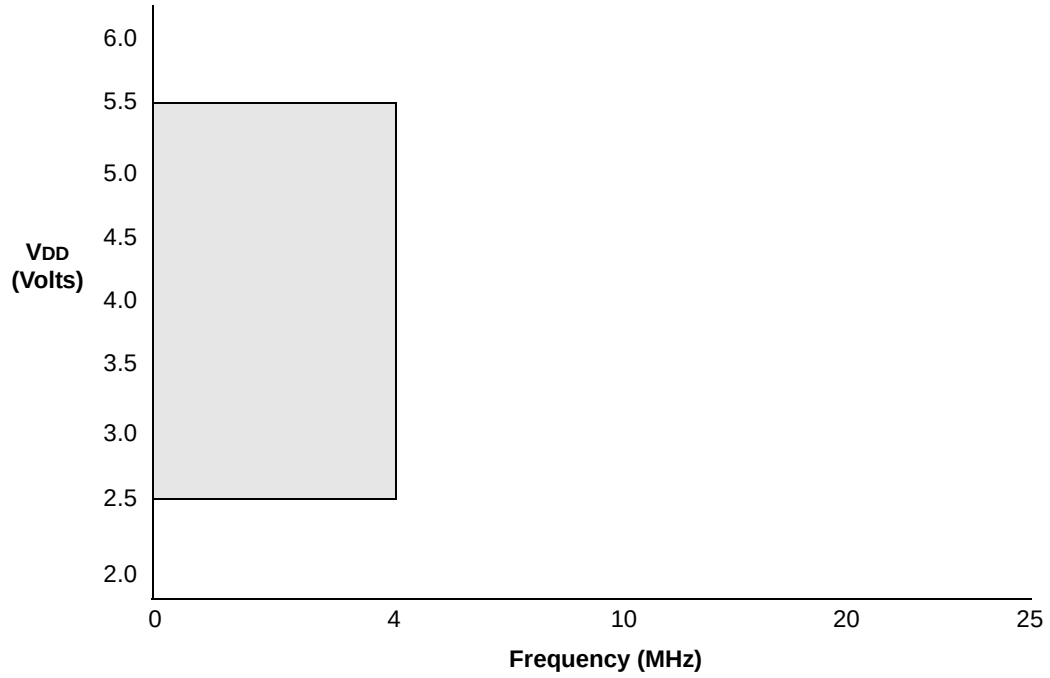
FIGURE 2: PIC16LC62XA VOLTAGE-FREQUENCY GRAPH, 0°C ≤ TA ≤ +70°C



Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

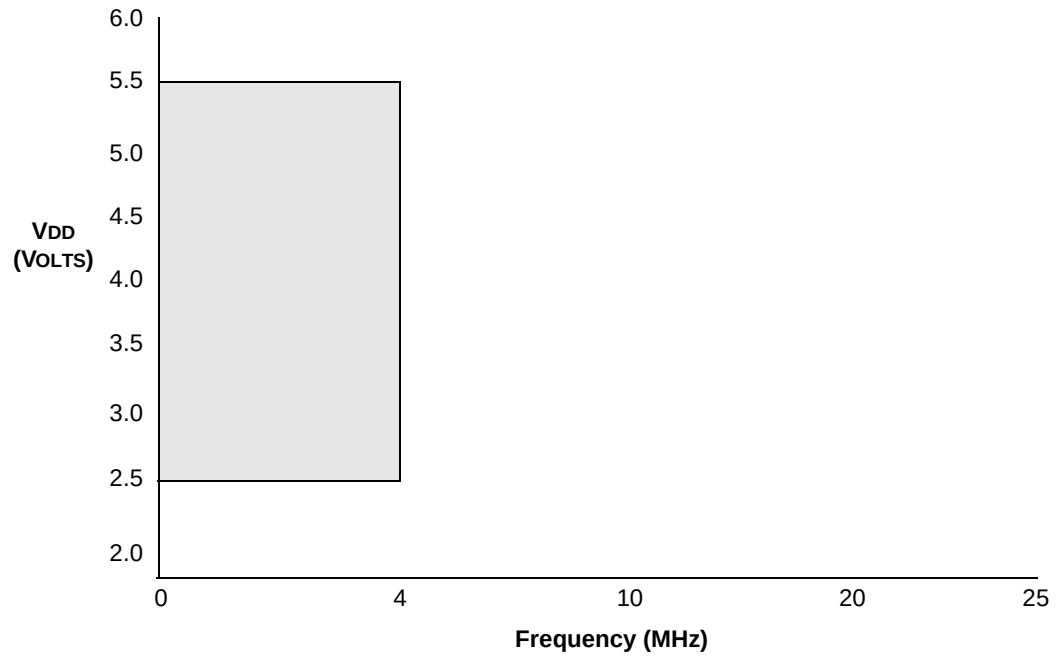
FIGURE 3: PIC16LC62XA VOLTAGE-FREQUENCY GRAPH, +70°C ≤ TA ≤ +125°C



Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

FIGURE 4: PIC16LCR62XA VOLTAGE-FREQUENCY GRAPH, -40°C ≤ TA ≤ +125°C



Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

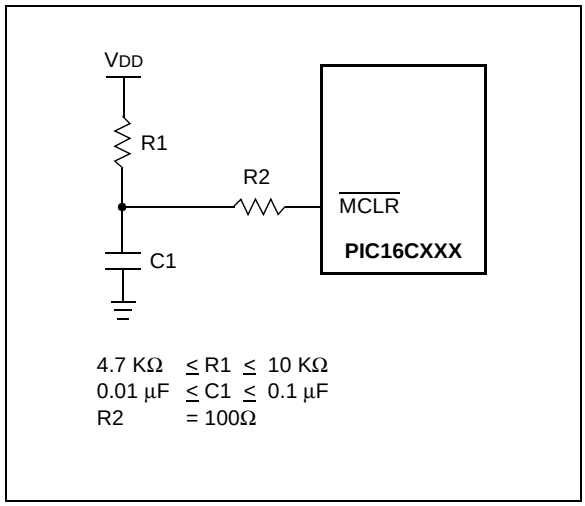
2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

1. Module: RESET

The minimum specification for the $\overline{MCLR}$ must be met in order to reset the PIC16CXXX. If a $\overline{MCLR}$ pulse occurs that is less than the minimum specification (parameter #30), improper device operation can occur.

If the minimum specification cannot be met, then an external circuit must be used to insure that any pulse width, less than the specification, will be filtered before it reaches the $\overline{MCLR}$ pin.

FIGURE 1: $\overline{MCLR}$ EXTERNAL CIRCUIT



Work around

A possible circuit is shown in Figure 1. Proper design validation needs to be done to ensure desired operation over the applications operating conditions.

2. Module: Oscillator

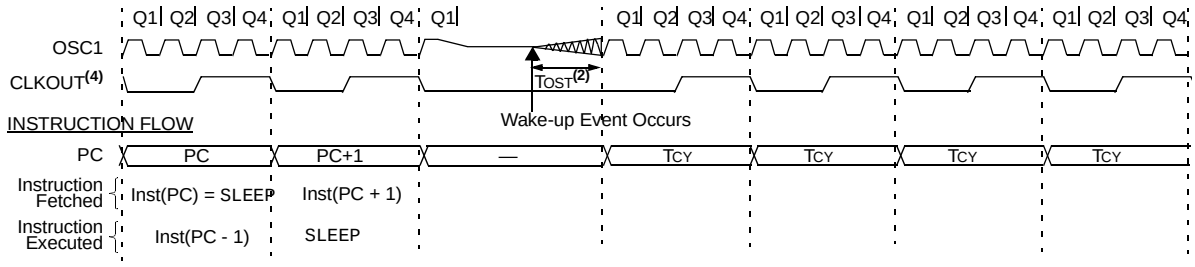
The Oscillator Start-up Timer (TOST) delay may not occur when the device wakes up from SLEEP.

Figure 2 shows the start-up of the crystal after the event that causes the device to wake-up from SLEEP mode (as specified in the Device Data Sheet). The start-up time (TOST) may not occur.

The events that wake-up the device from SLEEP are:

- An interrupt
- A WDT overflow (wake-up)
- A Brown-out Reset
- A $\overline{\text{MCLR}}$ Reset

FIGURE 2: WAKE-UP FROM SLEEP



Note 1: For TOST delay to be enabled, the XT, HS, or LP Oscillator mode must be selected.

2: TOST = 1024TOSC, This delay may not occur, and every valid clock edge will generate internal device clocks.

3: CLKOUT is not available in these OSC modes, but shown here for timing reference.

In applications where time-based measurements are started immediately after wake-up from SLEEP, the suggested work around should be implemented.

Work around

After the SLEEP instruction, do a software delay of 256 TCY (same as 1024 TOSC). At the RESET and Interrupt vector addresses, test to see if the device woke from SLEEP (the $\overline{\text{TO}}$ and $\overline{\text{PD}}$ bits), and if the device did wake from SLEEP, ensure that the total cycle delay is 256 TCY.

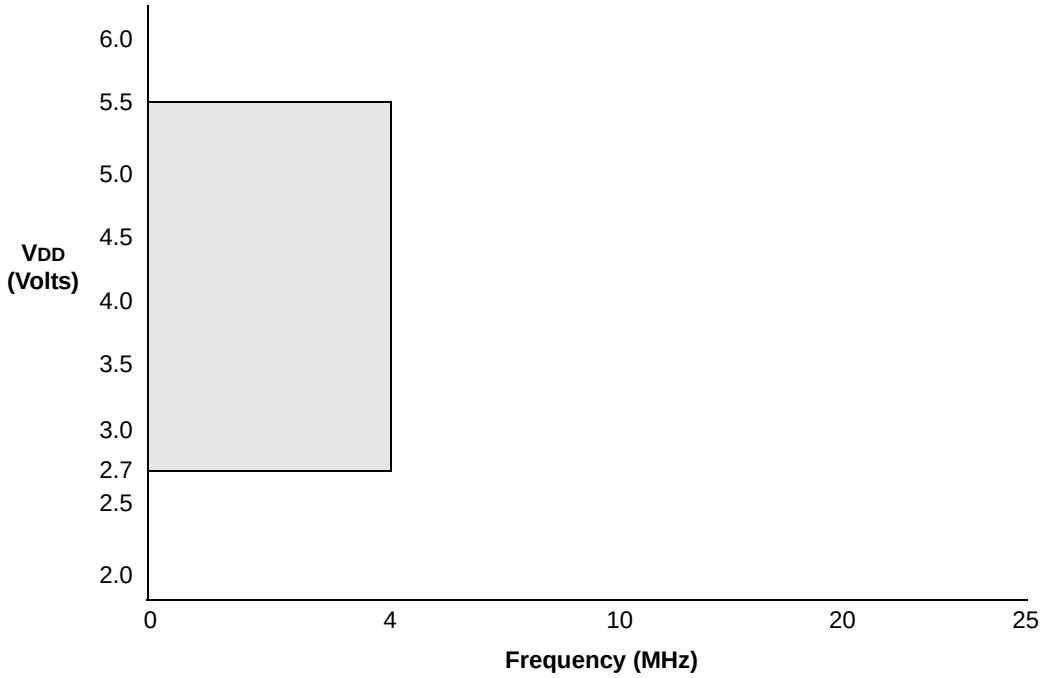
Clarifications/Corrections to the Data Sheets:

In the Device Data Sheets (DS30235**J** for 16C62XA and 16CR62XA, or DS40182**C** for 16CE62X), the following clarifications and corrections should be noted.

1. Module: Electrical Specifications

Figures 1 through 5 have been added.

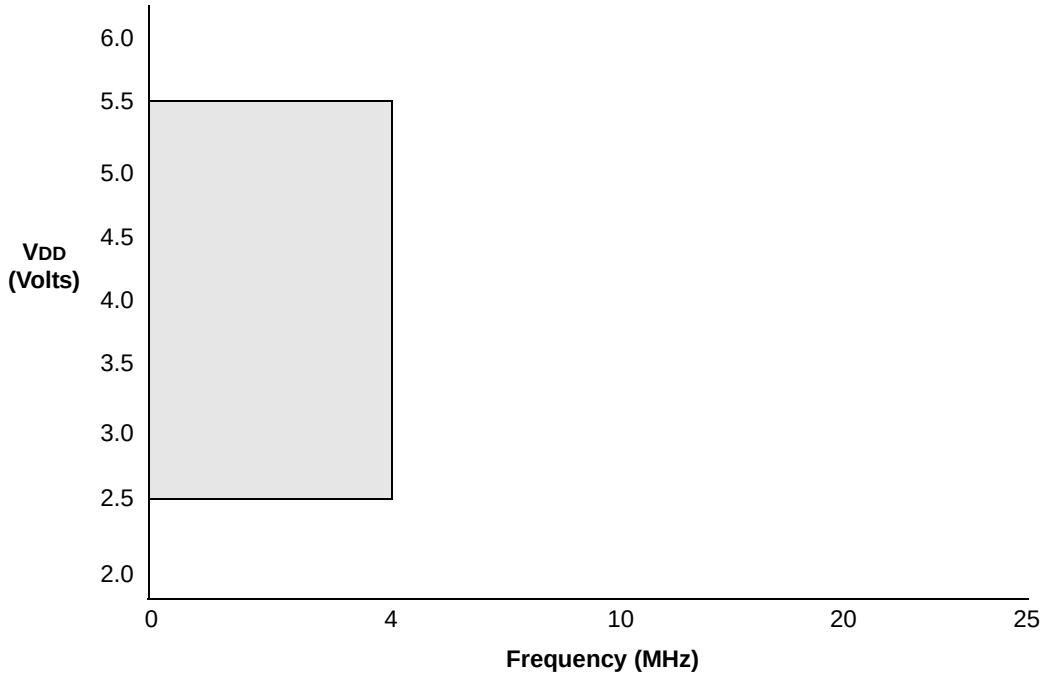
FIGURE 1: PIC16LC620A/LC621A/LC622A/LCE623/LCE624/LCE625-04 VOLTAGE-FREQUENCY GRAPH, -40°C ≤ TA ≤ 0°C



Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

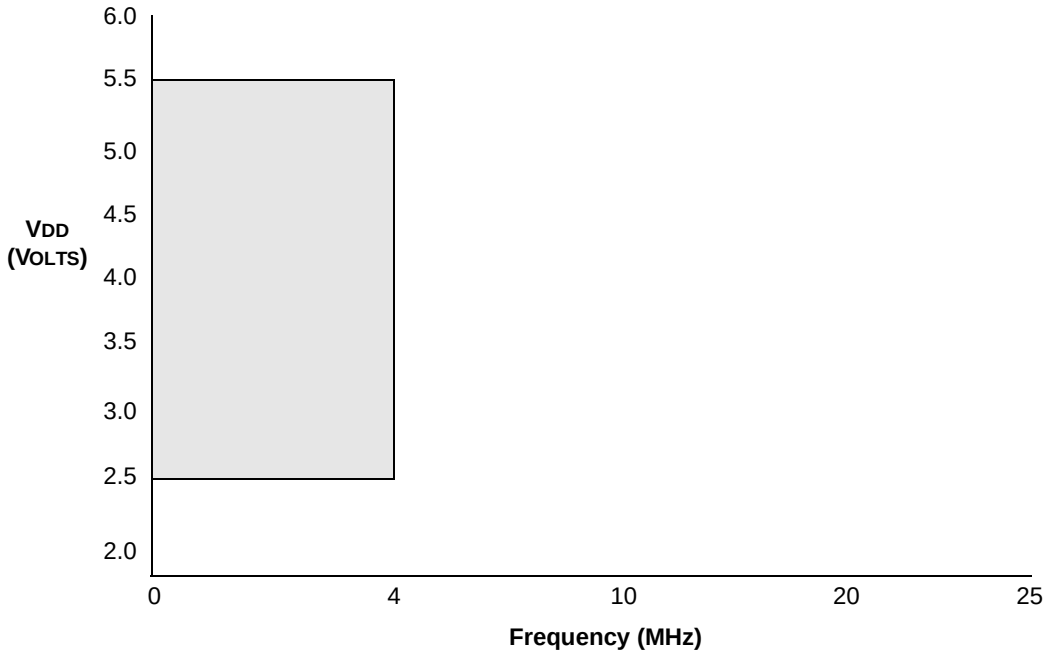
FIGURE 2: PIC16LC620A/LC621A/LC622A/LCE623/LCE624/LCE625-04 VOLTAGE-FREQUENCY GRAPH, 0°C ≤ TA ≤ +125°C



Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

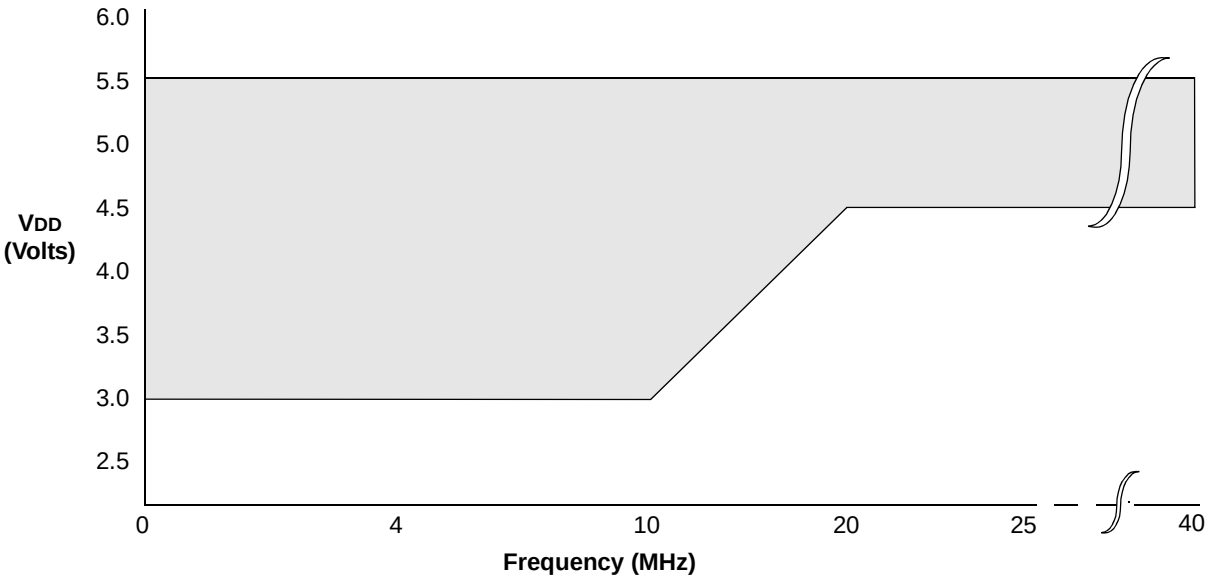
FIGURE 3: PIC16LCR620A-04 VOLTAGE-FREQUENCY GRAPH, -40°C ≤ TA ≤ +125°C



Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

FIGURE 4: PIC16C620A/C621A/C622A/CR620A - 40 VOLTAGE-FREQUENCY GRAPH, 0°C ≤ TA ≤ +70°C



Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

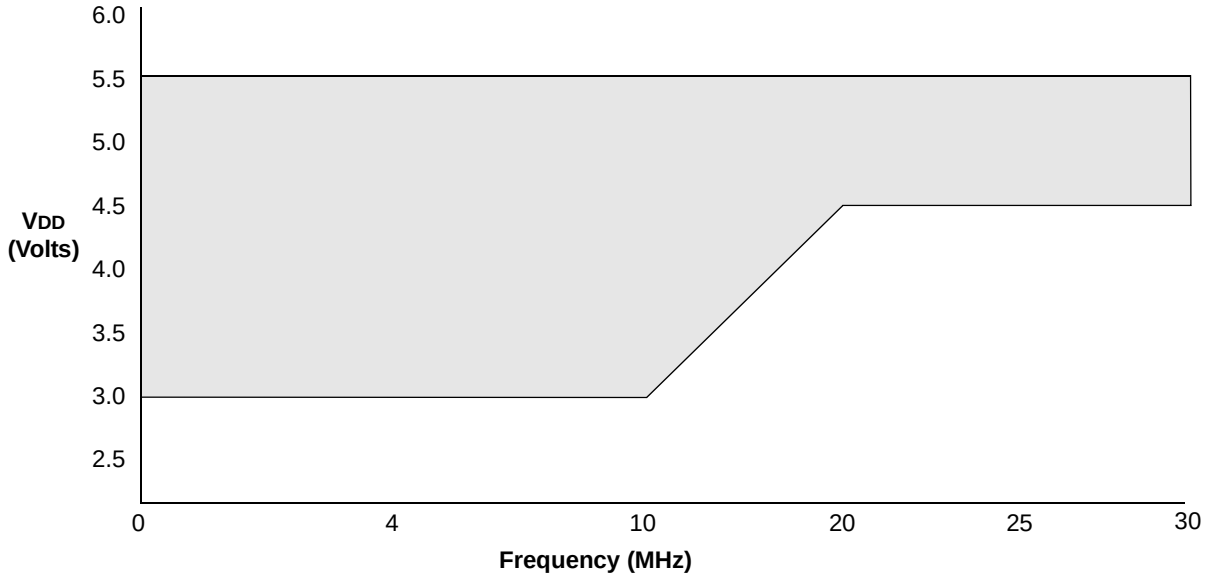
2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

3: Operation between 20 to 40 MHz requires the following:

- VDD between 4.5V. and 5.5V
- OSC1 externally driven
- OSC2 not connected
- HS mode
- Commercial temperatures

Devices qualified for 40 MHz operation have -40 designation (ex: PIC16C620A-40/P).

FIGURE 5: PIC16CE623/CE624/CE625-30 VOLTAGE-FREQUENCY GRAPH, 0°C ≤ TA ≤ +70°C



Note 1: The shaded region indicates the permissible combinations of voltage and frequency.

2: The maximum rated speed of the part limits the permissible combinations of voltage and frequency. Please reference the Product Identification System section for the maximum rated speed of the parts.

3: Operation between 20 to 30 MHz requires the following:

- VDD between 4.5V. and 5.5V
- OSC1 externally driven
- OSC2 not connected
- HS mode
- Commercial temperatures

Devices qualified for 30 MHz operation have -30 designation (ex: PIC16CE623-30/P).

2. Module: Electrical Specifications

Tables 1, 2, and 3 have been changed.

TABLE 1: DC CHARACTERISTICS: PIC16C620A/C621A/C622A-40(7) (Commercial) PIC16CR620A-40(7) (Commercial) PIC16CE62X-30(8) (Commercial)

DC CHARACTERISTICS			Standard Operating Conditions (unless otherwise stated) Operating temperature –40°C ≤ TA ≤ +85°C for industrial and 0°C ≤ TA ≤ +70°C for commercial and –40°C ≤ TA ≤ +125°C for extended				
Param No.	**Sym**	**Characteristic**	**Min**	**Typ†**	**Max**	**Units**	**Conditions**
D001	VDD	Supply Voltage	3.0	–	5.5	V	FOSC = DC to 20 MHz
D002	VDR	RAM Data Retention Voltage **(Note 1)**	–	1.5*	–	V	Device in SLEEP mode
D003	VPOR	VDD start voltage to ensure Power-on Reset	–	VSS	–	V	See section on Power-on Reset for details
D004	SVDD	VDD rise rate to ensure Power-on Reset	0.05 *	–	–	V/ms	See section on Power-on Reset for details
D005	VBOR	Brown-out Detect Voltage	3.65	4.0	4.35	V	BOREN configuration bit is cleared
D010	IDD	Supply Current **(Notes 2, 4)**	–	1.2	2.0	mA	FOSC = 4 MHz, VDD = 5.5V, WDT disabled, XT OSC mode, **(Note 4)***
			–	0.4	1.2	mA	FOSC = 4 MHz, VDD = 3.0V, WDT disabled, XT OSC mode, **(Note 4)**
			–	1.0	2.0	mA	FOSC = 10 MHz, VDD = 3.0V, WDT disabled, HS OSC mode, **(Note 6)**
			–	4.0	6.0	mA	FOSC = 20 MHz, VDD = 4.5V, WDT disabled, HS OSC mode
			–	4.0	7.0	mA	FOSC = 20 MHz, VDD = 5.5V, WDT disabled*, HS OSC mode
			–	35	70	µA	FOSC = 32 kHz, VDD = 3.0V, WDT disabled, LP OSC mode
D020	IPD	Power Down Current **(Note 3)**	–	–	2.2	µA	VDD = 3.0V
			–	–	5.0	µA	VDD = 4.5V*
			–	–	9.0	µA	VDD = 5.5V
			–	–	15	µA	VDD = 5.5V Extended

* These parameters are characterized but not tested.

† Data in "Typ" column is at 5.0V, 25°C, unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: This is the limit to which VDD can be lowered in SLEEP mode without losing RAM data.

2: The supply current is mainly a function of the operating voltage and frequency. Other factors such as I/O pin loading and switching rate, oscillator type, internal code execution pattern, and temperature also have an impact on the current consumption.
The test conditions for all IDD measurements in active operation mode are:
OSC1 = external square wave, from rail-to-rail; all I/O pins tri-stated, pulled to VDD, $\overline{MCLR}$ = VDD; WDT enabled/disabled as specified.

3: The power-down current in SLEEP mode does not depend on the oscillator type. Power-down current is measured with the part in SLEEP mode, with all I/O pins in hi-impedance state and tied to VDD or VSS.

4: For RC OSC configuration, current through REXT is not included. The current through the resistor can be estimated by the formula Ir = VDD/2REXT (mA) with REXT in kΩ.

5: The Δ current is the additional current consumed when this peripheral is enabled. This current should be added to the base IDD or IPD measurement.

6: Commercial temperature range only.

7: See Table 3 and Table 4 for 16C62X and 16CR62X devices for operation between 20 MHz and 40 MHz for valid modified characteristics.

8: See Table 5 and Table 6 for 16CE62X devices for operation between 20 MHz and 30 MHz for valid modified characteristics.

TABLE 1: DC CHARACTERISTICS: PIC16C620A/C621A/C622A-40[7] (Commercial) PIC16CR620A-40[7] (Commercial) PIC16CE62X-30[8] (Commercial) (CONTINUED)

DC CHARACTERISTICS			Standard Operating Conditions (unless otherwise stated) Operating temperature –40°C ≤ TA ≤ +85°C for industrial and 0°C ≤ TA ≤ +70°C for commercial and –40°C ≤ TA ≤ +125°C for extended				
Param No.	**Sym**	**Characteristic**	**Min**	**Typ†**	**Max**	**Units**	**Conditions**
D022	ΔIWDT	WDT Current **(Note 5)**	–	6.0	10	µA	VDD = 4.0V
					12	µA	(125°C)
D022A	ΔIBOR	Brown-out Reset Current **(Note 5)**	–	75	125	µA	$\overline{\text{BOD}}$ enabled, VDD = 5.0V
D023	ΔICOMP	Comparator Current for each Comparator **(Note 5)**	–	30	60	µA	VDD = 4.0V
D023A	ΔIVREF	VREF Current **(Note 5)**	–	80	135	µA	VDD = 4.0V
	ΔIEE Write	Operating Current	–		3	mA	VCC = 5.5V, SCL = 400 kHz
	ΔIEE Read	Operating Current	–		1	mA	
	ΔIEE	Standby Current	–		30	µA	VCC = 3.0V, EE VDD = VCC
	ΔIEE	Standby Current	–		100	µA	VCC = 3.0V, EE VDD = VCC
1A	FOSC	LP Oscillator Operating Frequency	0	–	200	kHz	All temperatures
		RC Oscillator Operating Frequency	0	–	4	MHz	All temperatures
		XT Oscillator Operating Frequency	0	–	4	MHz	All temperatures
		HS Oscillator Operating Frequency	0	–	20	MHz	All temperatures

* These parameters are characterized but not tested.

† Data in "Typ" column is at 5.0V, 25°C, unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: This is the limit to which VDD can be lowered in SLEEP mode without losing RAM data.

2: The supply current is mainly a function of the operating voltage and frequency. Other factors such as I/O pin loading and switching rate, oscillator type, internal code execution pattern, and temperature also have an impact on the current consumption.
The test conditions for all IDD measurements in active operation mode are:
OSC1 = external square wave, from rail-to-rail; all I/O pins tri-stated, pulled to VDD, $\overline{\text{MCLR}}$ = VDD; WDT enabled/disabled as specified.

3: The power-down current in SLEEP mode does not depend on the oscillator type. Power-down current is measured with the part in SLEEP mode, with all I/O pins in hi-impedance state and tied to VDD or VSS.

4: For RC OSC configuration, current through REXT is not included. The current through the resistor can be estimated by the formula Ir = VDD/2REXT (mA) with REXT in kΩ.

5: The Δ current is the additional current consumed when this peripheral is enabled. This current should be added to the base IDD or IPD measurement.

6: Commercial temperature range only.

7: See Table 3 and Table 4 for 16C62X and 16CR62X devices for operation between 20 MHz and 40 MHz for valid modified characteristics.

8: See Table 5 and Table 6 for 16CE62X devices for operation between 20 MHz and 30 MHz for valid modified characteristics.

**TABLE 2: DC CHARACTERISTICS: PIC16C620A/C621A/C622A-40[4] (Commercial)
PIC16CR620A-40[4] (Commercial)
PIC16CE62X-30[5] (Commercial)**

DC CHARACTERISTICS			Standard Operating Conditions (unless otherwise stated) Operating temperature –40°C ≤ TA ≤ +85°C for industrial and 0°C ≤ TA ≤ +70°C for commercial and –40°C ≤ TA ≤ +125°C for extended				
Parm No.	**Sym**	**Characteristic**	**Min**	**Typ†**	**Max**	**Unit**	**Conditions**
	VIL	**Input Low Voltage**					
		I/O ports					
D030		with TTL buffer	VSS	–	0.8V 0.15VDD	V	VDD = 4.5V to 5.5V, otherwise
D031		with Schmitt Trigger input	VSS		0.2VDD	V	
D032		MCLR, RA4/T0CKI, OSC1 (in RC mode)	VSS	–	0.2VDD	V	**(Note 1)**
D033		OSC1 (in XT and HS)	VSS	–	0.3VDD	V	
		OSC1 (in LP)	VSS	–	0.6VDD - 1.0	V	
	VIH	**Input High Voltage**					
		I/O ports					
D040		with TTL buffer	2.0V .25VDD + 0.8	–	VDD VDD	V	VDD = 4.5V to 5.5V, otherwise
D041		with Schmitt Trigger input	0.8VDD		VDD		
D042		MCLR RA4/T0CKI	0.8VDD	–	VDD	V	
D043		OSC1 (XT, HS and LP)	0.7VDD	–	VDD	V	
D043A		OSC1 (in RC mode)	0.9VDD				**(Note 1)**
D070	IPURB	**PORTB Weak Pull-up Current**	50	200	400	µA	VDD = 5.0V, VPIN = VSS
	IIL	**Input Leakage Current (Notes 2, 3)**					
		I/O ports (except PORTA)			±1.0	µA	VSS ≤ VPIN ≤ VDD, pin at hi-impedance
D060		PORTA	–	–	±0.5	µA	Vss ≤ VPIN ≤ VDD, pin at hi-impedance
D061		RA4/T0CKI	–	–	±1.0	µA	Vss ≤ VPIN ≤ VDD
D063		OSC1, MCLR	–	–	±5.0	µA	Vss ≤ VPIN ≤ VDD, XT, HS and LP OSC configuration
	VOL	**Output Low Voltage**					
D080		I/O ports	–	–	0.6	V	IOL=8.5 mA, VDD=4.5V, -40° to +85°C
			–	–	0.6	V	IOL=7.0 mA, VDD=4.5V, +125°C
D083		OSC2/CLKOUT (RC only)	–	–	0.6	V	IOL=1.6 mA, VDD=4.5V, -40° to +85°C
			–	–	0.6	V	IOL=1.2 mA, VDD=4.5V, +125°C
	VOH	**Output High Voltage (Note 3)**					
D090		I/O ports (except RA4)	VDD-0.7	–	–	V	IOH=-3.0 mA, VDD=4.5V, -40° to +85°C
			VDD-0.7	–	–	V	IOH=-2.5 mA, VDD=4.5V, +125°C
D092		OSC2/CLKOUT (RC only)	VDD-0.7	–	–	V	IOH=-1.3 mA, VDD=4.5V, -40° to +85°C
			VDD-0.7	–	–	V	IOH=-1.0 mA, VDD=4.5V, +125°C
*D150	VOD	**Open Drain High Voltage**			8.5	V	RA4 pin

* These parameters are characterized but not tested.

† Data in "Typ" column is at 5.0V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: In RC oscillator configuration, the OSC1 pin is a Schmitt Trigger input. It is not recommended that the PIC16CE62X be driven with external clock in RC mode.

2: The leakage current on the MCLR pin is strongly dependent on applied voltage level. The specified levels represent normal operating conditions. Higher leakage current may be measured at different input voltages.

3: Negative current is defined as coming out of the pin.

4: See Table 3 and Table 4 for 16C62X and 16CR62X devices for operation between 20 MHz and 40 MHz for valid modified characteristics.

5: See Table 5 and Table 6 for 16CE62X devices for operation between 20 MHz and 30 MHz for valid modified characteristics.

TABLE 2: DC CHARACTERISTICS: PIC16C620A/C621A/C622A-40[4] (Commercial) PIC16CR620A-40[4] (Commercial) PIC16CE62X-30[5] (Commercial)

DC CHARACTERISTICS			Standard Operating Conditions (unless otherwise stated) Operating temperature –40°C ≤ TA ≤ +85°C for industrial and 0°C ≤ TA ≤ +70°C for commercial and –40°C ≤ TA ≤ +125°C for extended				
Parm No.	**Sym**	**Characteristic**	**Min**	**Typ†**	**Max**	**Unit**	**Conditions**
		Capacitive Loading Specs on Output Pins					
D100	COSC2	OSC2 pin			15	pF	In XT, HS and LP modes when external clock used to drive OSC1.
D101	CIO	All I/O pins/OSC2 (in RC mode)			50	pF	

* These parameters are characterized but not tested.

† Data in "Typ" column is at 5.0V, 25°C unless otherwise stated. These parameters are for design guidance only and are not tested.

Note 1: In RC oscillator configuration, the OSC1 pin is a Schmitt Trigger input. It is not recommended that the PIC16CE62X be driven with external clock in RC mode.

2: The leakage current on the $\overline{MCLR}$ pin is strongly dependent on applied voltage level. The specified levels represent normal operating conditions. Higher leakage current may be measured at different input voltages.

3: Negative current is defined as coming out of the pin.

4: See Table 3 and Table 4 for 16C62X and 16CR62X devices for operation between 20 MHz and 40 MHz for valid modified characteristics.

5: See Table 5 and Table 6 for 16CE62X devices for operation between 20 MHz and 30 MHz for valid modified characteristics.

TABLE 3: DC CHARACTERISTICS: PIC16C620A/C621A/C622A-40[3] (Commercial) PIC16CR620A-40[3] (Commercial)

DC Characteristics Power Supply Pins		Standard Operating Conditions (unless otherwise specified) Operating Temperature 0°C ≤ TA ≤ +70°C (commercial)				
Characteristic	**Sym**	**Min**	**Typ[1]**	**Max**	**Units**	**Conditions**
Supply Voltage	VDD	4.5	—	5.5	V	HS Option from 20 - 40 MHz
Supply Current[2]	IDD	— —	5.5 7.7	11.5 16	mA mA	FOSC = 40 MHz, VDD = 4.5V, HS mode FOSC = 40 MHz, VDD = 5.5V, HS mode
HS Oscillator Operating Frequency	FOSC	20	—	40	MHz	OSC1 pin is externally driven, OSC2 pin not connected
Input Low Voltage OSC1	VIL	VSS	—	0.2VDD	V	HS mode, OSC1 externally driven
Input High Voltage OSC1	VIH	0.8VDD	—	VDD	V	HS mode, OSC1 externally driven

* 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: The supply current is mainly a function of the operating voltage and frequency. Other factors such as bus loading, oscillator type, 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: OSC1 = external square wave, from rail-to-rail; all I/O pins tri-stated, pulled to VSS, T0CKI = VDD, $\overline{MCLR}$ = VDD; WDT disabled, HS mode with OSC2 not connected.

3: For device operation between DC and 20 MHz, see Table 1 and Table 2.

3. Module: Electrical Specifications

Tables 4, 5, and 6 have been added.

TABLE 4: AC CHARACTERISTICS: PIC16C620A/C621A/C622A-40[2] (Commercial) PIC16CR620A-40[2] (Commercial)

DC Characteristics All Pins Except Power Supply Pins		Standard Operating Conditions (unless otherwise specified) Operating Temperature 0°C ≤ TA ≤ +70°C (commercial)				
Characteristic	**Sym**	**Min**	**Typ[1]**	**Max**	**Units**	**Conditions**
External CLKIN Frequency	FOSC	20	—	40	MHz	HS mode, OSC1 externally driven
External CLKIN Period	TOSC	25	—	50	ns	HS mode (40),OSC1 externally driven
Clock in (OSC1) Low or High Time	TOSL, TOSH	6	—	—	ns	HS mode,OSC1 externally driven
Clock in (OSC1) Rise or Fall Time	TOSR, TOSF	—	—	6.5	ns	HS mode, OSC1 externally driven
OSC1↑ (Q1 cycle) to Port out valid	TOSH2IOV	—	—	100	ns	—
OSC1↑ (Q2 cycle) to Port input invalid (I/O in hold time)	TOSH2IOI	50	—	—	ns	—

Note 1: 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.

2: For device operation between DC and 20 MHz, see Table 1 and Table 2.

TABLE 5: DC CHARACTERISTICS: PIC16CE623A/CE624/CE625-30[3] (Commercial)

DC Characteristics Power Supply Pins		Standard Operating Conditions (unless otherwise specified) Operating Temperature 0°C ≤ TA ≤ +70°C (commercial)				
Characteristic	**Sym**	**Min**	**Typ[1]**	**Max**	**Units**	**Conditions**
Supply Voltage	VDD	4.5	—	5.5	V	HS option from 20 - 30 MHz
Supply Current[2]	IDD	— —	4.4 5.8	9.1 12.0	mA mA	FOSC = 30 MHz, VDD = 4.5V, HS mode FOSC = 30 MHz, VDD = 5.5V, HS mode
HS Oscillator Operating Frequency	FOSC	20	—	30	MHz	OSC1 pin is externally driven, OSC2 pin not connected
Input Low Voltage OSC1	VIL	VSS	—	0.2VDD	V	HS mode, OSC1 externally driven
Input High Voltage OSC1	VIH	0.8VDD	—	VDD	V	HS mode, OSC1 externally driven

* 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: The supply current is mainly a function of the operating voltage and frequency. Other factors such as bus loading, oscillator type, 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: OSC1 = external square wave, from rail-to-rail; all I/O pins tri-stated, pulled to VSS, T0CKI = VDD, $\overline{MCLR}$ = VDD; WDT disabled, HS mode with OSC2 not connected.

3: For device operation between DC and 20 MHz, see Table 1 and Table 2.

TABLE 6: AC CHARACTERISTICS: PIC16CE623/CE624/CE625-30[2] (Commercial)

DC Characteristics All Pins Except Power Supply Pins		Standard Operating Conditions (unless otherwise specified) Operating Temperature 0°C ≤ TA ≤ +70°C (commercial)				
Characteristic	**Sym**	**Min**	**Typ[1]**	**Max**	**Units**	**Conditions**
External CLKIN Frequency	FOSC	20	—	30	MHz	HS mode, OSC1 externally driven
External CLKIN Period	TOSC	33	—	50	ns	HS mode (30), OSC1 externally driven
Clock in (OSC1) Low or High Time	TOSL, TOSH	6	—	—	ns	HS mode, OSC1 externally driven
Clock in (OSC1) Rise or Fall Time	TOSR, TOSF	—	—	10.5	ns	HS mode, OSC1 externally driven
OSC1↑ (Q1 cycle) to Port out valid	TOSH2IOV	—	—	132	ns	—
OSC1↑ (Q2 cycle) to Port input invalid (I/O in hold time)	TOSH2IOI	66	—	—	ns	—

Note 1: 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.

2: For device operation between DC and 20 MHz, see Table 1 and Table 2.

4. RC Oscillator

In the RC Oscillator, Section 9.2.4., page 48, the text and figure should be as follows:

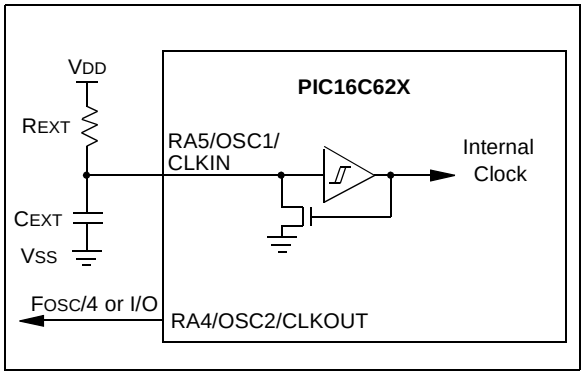
For applications where precise timing is not a requirement, the RC oscillator option is available. The operation and functionality of the RC oscillator is dependent upon a number of variables. The RC oscillator frequency is a function of:

- Supply voltage
- Resistor (REXT) and capacitor (CEXT) values
- Operating temperature.

The oscillator frequency will vary from unit to unit due to normal process parameter variation. The difference in lead frame capacitance between package types will also affect the oscillation frequency, especially for low CEXT values. The user also needs to account for the tolerance of the external R and C components. Figure 9-5 shows how the R/C combination is connected.

Two options are available for this oscillator mode which allow RA4 to be used as a general purpose I/O or to output FOSC/4.

FIGURE 9-5: RC OSCILLATOR MODE



APPENDIX A: REVISION HISTORY

Rev A Document (3/2001)

First revision of this document.

Rev B Document (5/2001)

Under Clarifications/Corrections to the Data Sheets, Figures 1 through 5 were added (pages 3 through 7).

Changes were made to Tables 1, 2, and 3 (pages 8 through 11).

Table 4, 5 and 6 were added (pages 11 and 12).

Rev C Document (10/2001)

Under Clarifications/Corrections to the Data Sheets, Item 2, Table 1, Parameter number D005, under the “Min” column, “3.7” was changed to “3.65” (page 12).

Rev D Document (04/2004)

Under Clarifications/Corrections to the Data Sheets, Added Module 4: Corrections to Figure 9-5: RC Oscillator Mode diagram.

Obsoleted DS80065B PIC16C62XA Rev. A Silicion Errata and incorporated into this document.

NOTES:

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