Product Change Notification / SYST-29QVOH022

Date:

01-Dec-2022

Product Category:

Clock and Timing - Oscillators

PCN Type:

Document Change

Notification Subject:

Data Sheet - DSC61xxB - Ultra-Small, Ultra-Low Power MEMS Oscillator

Affected CPNs:

SYST-29QVOH022_Affected_CPN_12012022.pdf
SYST-29QVOH022_Affected_CPN_12012022.csv

Notification Text:

SYST-29QVOH022

Microchip has released a new Datasheet for the DSC61xxB - Ultra-Small, Ultra-Low Power MEMS Oscillator of devices. If you are using one of these devices please read the document located at DSC61xxB - Ultra-Small, Ultra-Low Power MEMS Oscillator.

Notification Status: Final

Description of Change: 1) Added the 7.0 mm x 5.0 mm VDFN, 5.0 mm x 3.2 mm VDFN, and 3.2 mm x 2.5 mm VDFN package options throughout the document.
2) Updated the previously existing package outline drawings to their most current versions

Impacts to Data Sheet: None

Change Implementation Status: Complete

Date Document Changes Effective: 01 Dec 2022

NOTE: Please be advised that this is a change to the document only the product has not been changed.

Markings to Distinguish Revised from Unrevised Devices: N/A

Attachments:

DSC61xxB - Ultra-Small, Ultra-Low Power MEMS Oscillator

Please contact your local Microchip sales office with questions or concerns regarding this notification.

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DSC61XXB

Ultra-Small, Ultra-Low Power MEMS Oscillator

Features

- Wide Frequency Range: 3.5 kHz to 100 MHz
- Ultra-Low Power Consumption: 3 mA/1 µA (Active/Standby)
- Ultra-Small Footprints
  - 1.6 mm x 1.2 mm VFLGA
  - 2.0 mm x 1.6 mm VFLGA
  - 2.5 mm x 2.0 mm VLGA
  - 3.2 mm x 2.5 mm VDFN
  - 5.0 mm x 3.2 mm VDFN
  - 7.0 mm x 5.0 mm VDFN
- Frequency Select Input Supports Two Pre-Defined Frequencies
- High Stability: ±20 ppm, ±25 ppm, ±50 ppm
- Wide Temperature Range
  - Automotive: –40°C to +125°C
  - Ext. Industrial: –40°C to +105°C
  - Industrial: –40°C to +85°C
  - Ext. Commercial: –20° to +70°C
- Excellent Shock and Vibration Immunity
  - Qualified to MIL-STD-883
- High Reliability
  - 20x Better MTF Than Quartz Oscillators
- Supply Range of 1.71V to 3.63V
- Short Sample Lead Time: <2 weeks
- Lead Free & RoHS Compliant
- Automotive Version Available: DSA61xxB

Applications

- Low Power/Portable Applications: IoT, Embedded/Smart Devices
- Consumer: Home Healthcare, Fitness Devices, Home Automation
- Industrial: Building/Factory Automation, Surveillance Camera
- Automotive (Please Refer to the DSA61xx Family)

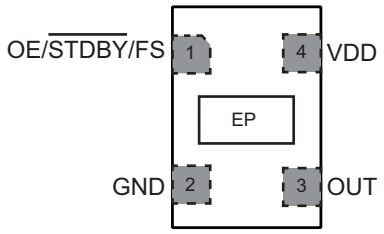
General Description

The DSC61xxB family of MEMS oscillators combines the industry leading low power consumption and ultra-small packages with exceptional frequency stability and jitter performance over temperature. The single-output DSC61xxB MEMS oscillators are excellent choices for use as clock references in small, battery-powered devices such as wearable and Internet of Things (IoT) devices in which small size, low power consumption, and long-term reliability are paramount.

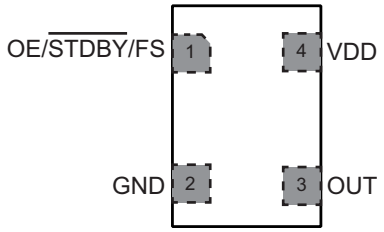
The DSC61xxB family is available in 1.6 mm x 1.2 mm & 2.0 mm x 1.6 mm VFLGA, 7.0 mm x 5.0 mm, 5.0 mm x 3.2 mm & 3.2 mm x 2.5 mm VDFN, and 2.5 mm x 2.0 mm VLGA packages. These packages are “drop-in” replacements for standard 4-pin CMOS quartz crystal oscillators. The Automotive Grade AEC-Q100 qualified option is also available for this device.

Package Types

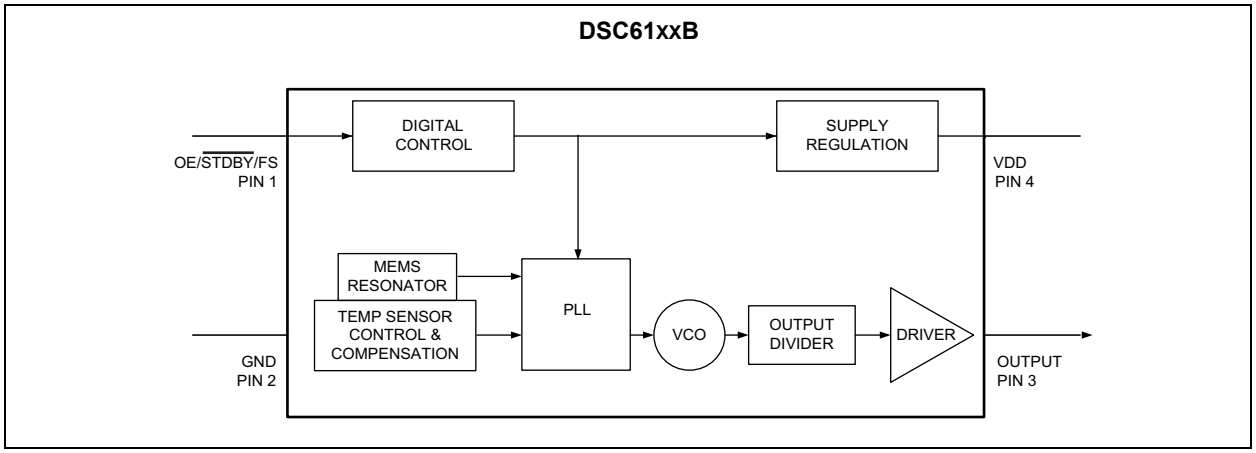
DSC61xxB
7.0 mm x 5.0 mm VDFN
(Top View)



DSC61xxB
5.0 mm x 3.2 mm VDFN
3.2 mm x 2.5 mm VDFN
2.5 mm x 2.0 mm VLGA
2.0 mm x 1.6 mm VFLGA
1.6 mm x 1.2 mm VFLGA
(Top View)



Block Diagram



1.0 ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Supply Voltage ..... –0.3V to +4.0V
Input Voltage (V_{IN}) ..... –0.3V to V_{DD}+0.3V
ESD Protection ..... 4 kV HBM, 400V MM, 2 kV CDM

ELECTRICAL CHARACTERISTICS

Electrical Characteristics: Unless otherwise indicated, V_{DD} = 1.8V –5% to 3.3V +10%, T_A = –40°C to +125°C.

Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
Supply Voltage	V_{DD}	1.71	—	3.63	V	Note 1
Power Supply Ramp	t_{PU}	0.1	—	100	ms	Note 8
Active Supply Current	I_{DD}	—	3.0	—	mA	f_{OUT} = 27 MHz, V_{DD} = 1.8V, No Load
Standby Supply Current	I_{STBY}	—	1	—	µA	V_{DD} = 1.8/2.5V, Note 2
		—	1.5	—		V_{DD} = 3.3V, Note 2
Output Duty Cycle	SYM	45	—	55	%	—
Frequency	f_0	0.0035	—	100	MHz	—
Frequency Stability	Δf	—	—	±20 ±25 ±50	ppm	All temp ranges, Note 3
Aging	Δf	—	—	±5	ppm	1st year @ 25°C
		—	—	±1		Per year after first year
Startup Time	t_{SU}	—	—	1.5	ms	From 90% V_{DD} to valid clock output, T = 25°C
Input Logic Levels	V_{IH}	0.7 x V_{DD}	—	—	V	Input Logic High, Note 4
	V_{IL}	—	—	0.3 x V_{DD}	V	Input Logic Low, Note 4
Output Disable Time	t_{DA}	—	—	200 + 2 Periods	ns	Note 5
Output Enable Time	t_{EN}	—	—	1	µs	Note 6
Enable Pull-up Resistor	—	—	300	—	kΩ	If configured, Note 7

Note 1: Pin 4 V_{DD} should be filtered with 0.1 µF capacitor.
2: Not including current through pull-up resistor on EN pin (if configured). Higher standby current seen at >3.3V V_{DD}.
3: Includes frequency variations due to initial tolerance, temp. and power supply voltage.
4: Input waveform must be monotonic with rise/fall time < 10 ms
5: Output Disable time takes up to two periods of the output waveform + 200 ns.
6: For parts configured with OE, not Standby.
7: Output is enabled if pad is floated or not connected.
8: Time to reach 90% of target V_{DD}. Power ramp rise must be monotonic.

ELECTRICAL CHARACTERISTICS (CONTINUED)

Electrical Characteristics: Unless otherwise indicated, V_{DD} = 1.8V –5% to 3.3V +10%, T_A = –40°C to +125°C.							
Parameters	**Sym.**	**Min.**	**Typ.**	**Max.**	**Units**	**Conditions**	
Output Logic Levels	V_{OH}	0.8 x V_{DD}	—	—	V	Output Logic High, I = 3 mA, Std. Drive	
						Output Logic High, I = 6 mA, High Drive	
	V_{OL}	—	—	0.2 x V_{DD}	V	Output Logic Low, I = –3 mA, Std. Drive	
						Output Logic Low, I = –6 mA, High Drive	
Output Transition Time Rise Time/Fall Time	t_{RX}/t_{FX}	—	1	1.5	ns	DSC61x2 High Drive, 20% to 80% C_L = 15 pF	V_{DD} = 1.8V
		—	0.5	1.0	ns		V_{DD} = 2.5V/3.3V
	t_{RY}/t_{FY}	—	1.2	2.0	ns	DSC61x1 Std Drive, 20% to 80% C_L = 10 pF	V_{DD} = 1.8V
		—	0.6	1.2	ns		V_{DD} = 2.5V/3.3V
Period Jitter, RMS	J_{PER}	—	8.5	—	ps_{RMS}	f_{OUT} = 27 MHz	V_{DD} = 1.8V
		—	7	—			V_{DD} = 2.5V/3.3V
Cycle-to-Cycle Jitter (Peak)	$J_{Cy–Cy}$	—	50	70	ps	f_{OUT} = 27 MHz	V_{DD} = 1.8V
		—	35	60			V_{DD} = 2.5V/3.3V
Period Jitter (Peak-to-Peak)	J_{PP}	—	70	—	ps	f_{OUT} = 27 MHz	V_{DD} = 1.8V
		—	60	—			V_{DD} = 2.5V/3.3V

Note 1: Pin 4 V_{DD} should be filtered with 0.1 µF capacitor.

2: Not including current through pull-up resistor on EN pin (if configured). Higher standby current seen at >3.3V V_{DD}.

3: Includes frequency variations due to initial tolerance, temp. and power supply voltage.

4: Input waveform must be monotonic with rise/fall time < 10 ms

5: Output Disable time takes up to two periods of the output waveform + 200 ns.

6: For parts configured with OE, not Standby.

7: Output is enabled if pad is floated or not connected.

8: Time to reach 90% of target V_{DD}. Power ramp rise must be monotonic.

TEMPERATURE SPECIFICATIONS (Note 1)

Parameters	Sym.	Min.	Typ.	Max.	Units	Conditions
Temperature Ranges						
Junction Operating Temperature	T_J	–40	—	+150	°C	—
Storage Ambient Temperature Range	T_A	–55	—	+150	°C	—
Soldering Temperature	T_S	—	+260	—	°C	40 sec. max.

Note 1: The maximum allowable power dissipation is a function of ambient temperature, the maximum allowable junction temperature and the thermal resistance from junction to air (i.e., T_A, T_J, θ_{JA}). Exceeding the maximum allowable power dissipation will cause the device operating junction temperature to exceed the maximum +150°C rating. Sustained junction temperatures above +150°C can impact the device reliability.

2.0 PIN DESCRIPTIONS

The DSC61xxB is a highly configurable device and can be factory programmed in many different ways to meet the customer's needs. Microchip's ClockWorks® Configurator http://clockworks.microchip.com/Timing/ must be used to choose the necessary options, create the final part number, data sheet, and order samples. The descriptions of the pins are listed in Table 2-1.

TABLE 2-1: DSC61XXB PIN FUNCTION TABLE

Pin Number	Pin Name	Description
1 (Note 1)	OE	Output Enable: H = Active, L = Disabled (High Impedance).
	$\overline{\text{STDBY}}$	Standby: H = Device is active, L = Device is in standby (Low Power Mode).
	FS	Frequency Select: H = Output Frequency 1, L = Output Frequency 2.
2	GND	Ground.
3	Output	Oscillator clock output.
4	VDD	Power supply: 1.71V to 3.63V.

Note 1: DSC610xB/1xB/3xB has a 300 kΩ internal pull-up resistor on pin 1. DSC614xB/5xB/7xB has no internal pull-up resistor on pin 1 and needs an external pull-up or to be driven by another chip.

An explanation of the different options listed in Table 2-1 follows.

2.1 Pin 1

This is a control pin and may be configured to fulfill one of three different functions. If not actively driven, a 10 kΩ pull-up resistor is recommended.

2.1.1 OUTPUT ENABLE (OE)

Pin 1 may be configured as OE. Oscillator output may be turned on and off according to the state of this pin.

2.1.2 $\overline{\text{STDBY}}$

Pin 1 may be configured as Standby. When the pin is low, both output buffer and PLL will be off and the device will enter a low power mode.

2.1.3 FREQUENCY SELECT (FS)

Pin 1 may be configured as FS. The output may be set to one of two pre-programmed frequencies. The output clock frequencies can only be set to either kHz or MHz. A combination of kHz and MHz cannot be set.

2.2 Pins 2 through 4

Pins 2 and 4 are the supply terminals, GND and VDD respectively. Pin 3 is the clock output, programmable to Standard and High Drive strength settings. Visit ClockWorks® Configurator to customize your device.

2.3 Output Buffer Options

The DSC61xx family is available in multiple output driver configurations.

The standard-drive (61x1) and high-drive (61x2) deliver respective output currents of greater than 3 mA and 6 mA at 20%/80% of the supply voltage. For heavy loads of 15 pF or higher, the high-drive option is recommended.

3.0 DIAGRAMS

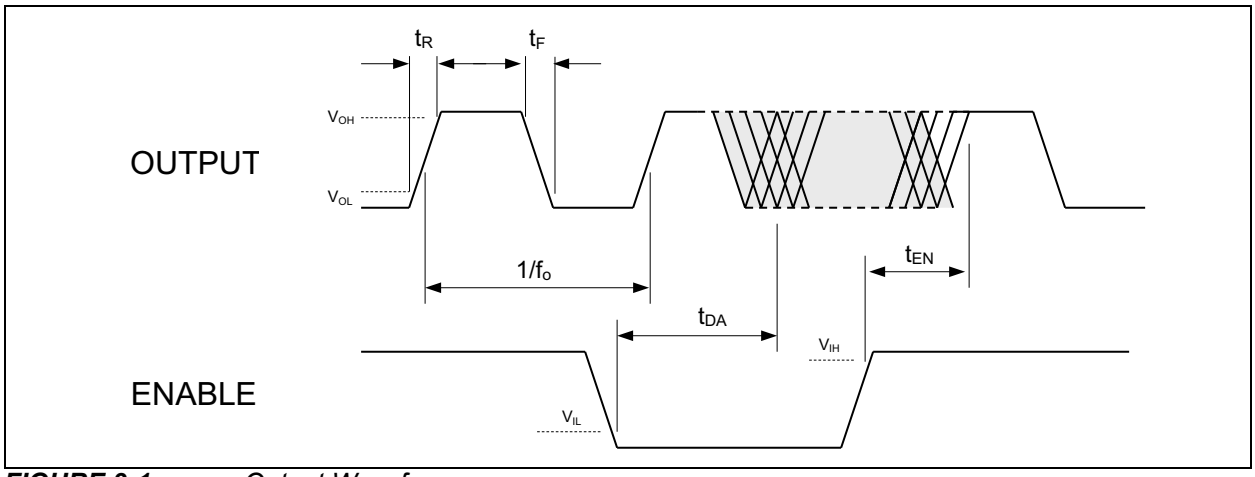


FIGURE 3-1: *Output Waveform.*

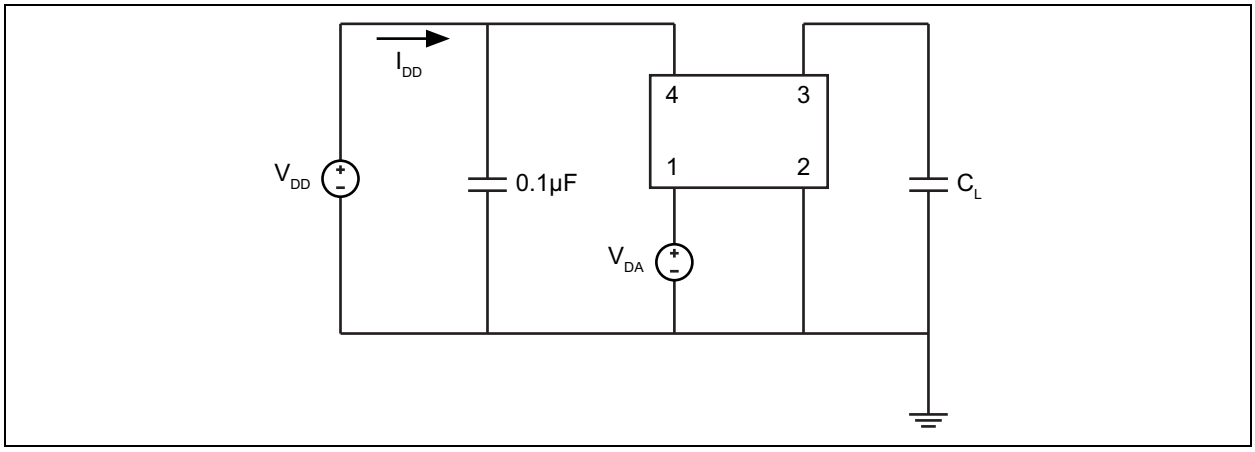


FIGURE 3-2: *Test Circuit.*

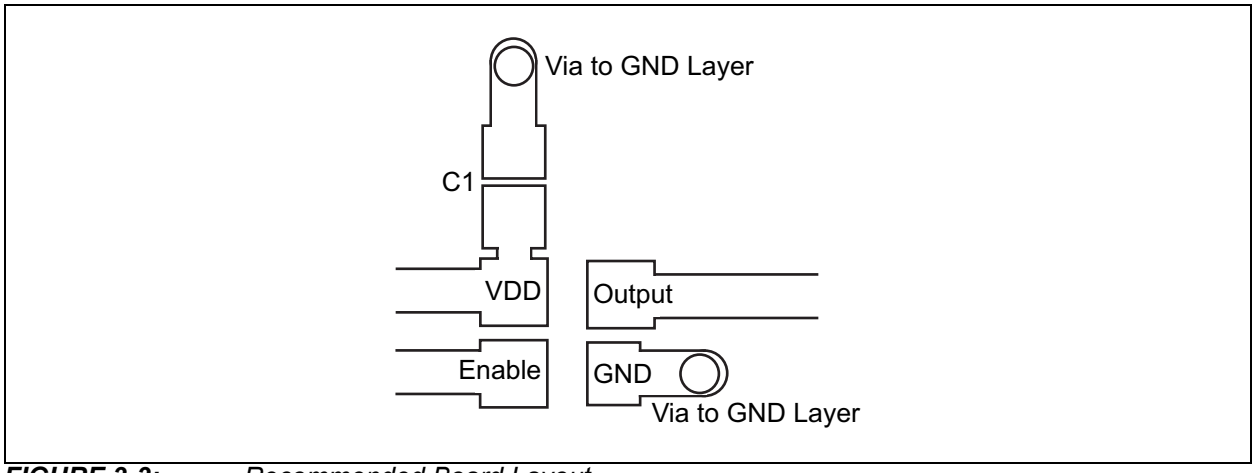


FIGURE 3-3: *Recommended Board Layout.*

4.0 SOLDER REFLOW PROFILE

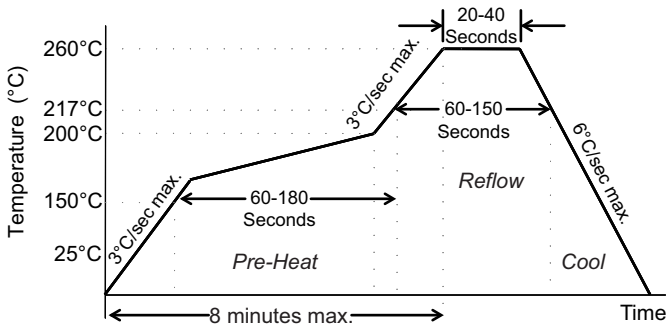


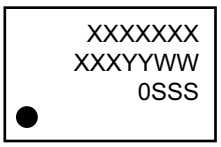
FIGURE 4-1: *Solder Reflow Profile.*

MSL 1 @ 260°C refer to JSTD-020C	
Ramp-Up Rate (200°C to Peak Temp)	3°C/sec. max.
Preheat Time 150°C to 200°C	60 to 180 sec.
Time maintained above 217°C	60 to 150 sec.
Peak Temperature	255°C to 260°C
Time within 5°C of actual Peak	20 to 40 sec.
Ramp-Down Rate	6°C/sec. max.
Time 25°C to Peak Temperature	8 minutes max.

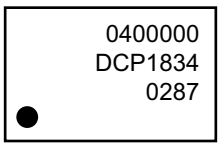
5.0 PACKAGING INFORMATION

5.1 Package Marking Information

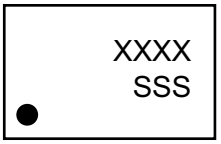
4-Lead
7.0mm x 5.0mm VDFN*
5.0mm x 3.2mm VDFN*
3.2mm x 2.5mm VDFN*
2.5mm x 2.0mm VLGA*



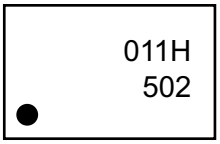
Example



4-Lead VFLGA*
2.0mm x 1.6mm
1.6mm x 1.2mm



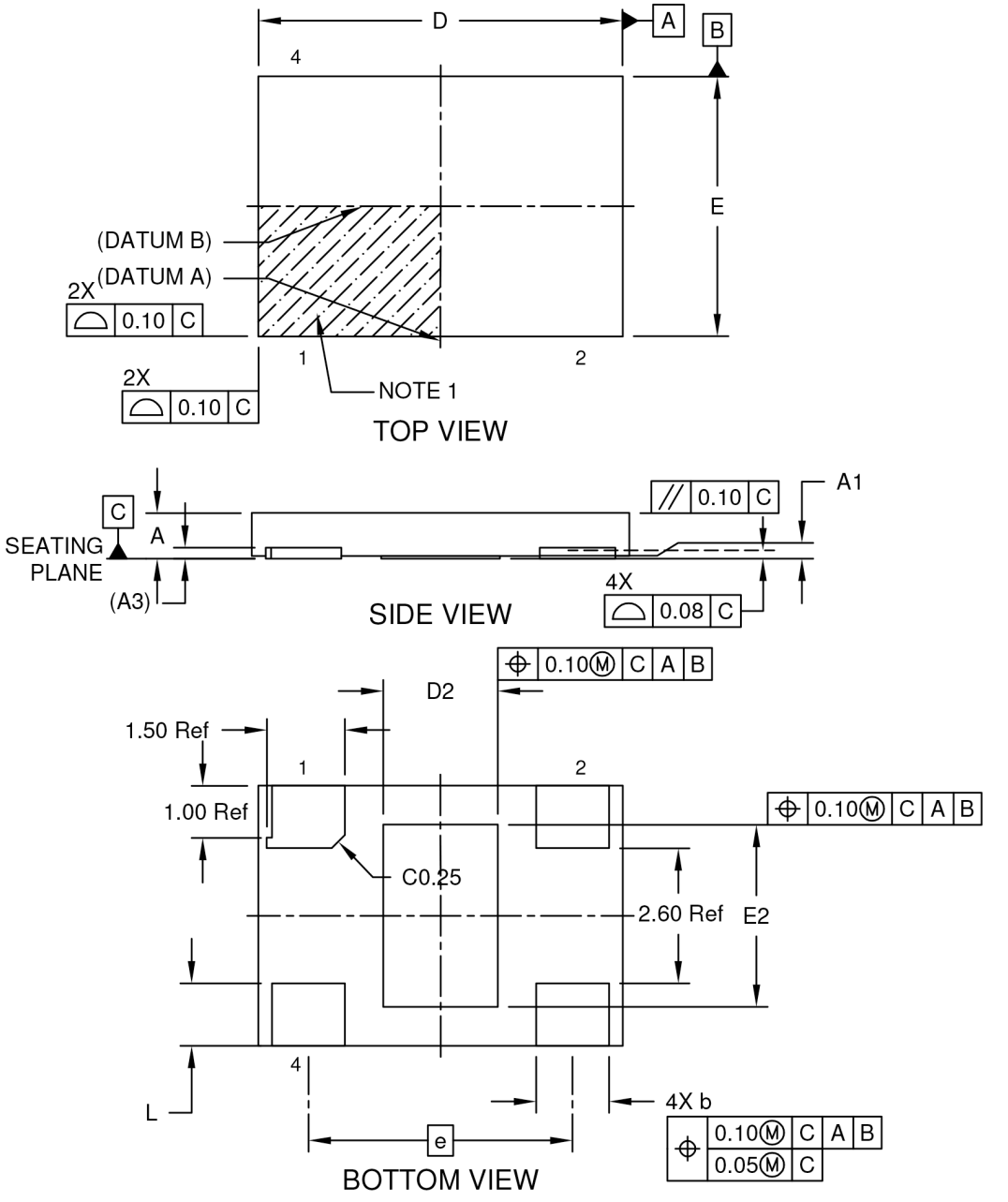
Example



Legend:	XX...X	Product code or 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’)
	SSS	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.
	●, ▲, ▼	Pin one index is identified by a dot, delta up, or delta down (triangle mark).
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. Package may or may not include the corporate logo.	
	Underbar (_) and/or Overbar (¯) symbol may not be to scale.	

4-Lead Very Thin Dual Flatpack, No Lead Package (JZA) - 7x5x0.9 mm Body [VDFN] With 2.2x3.5 mm Exposed Pad

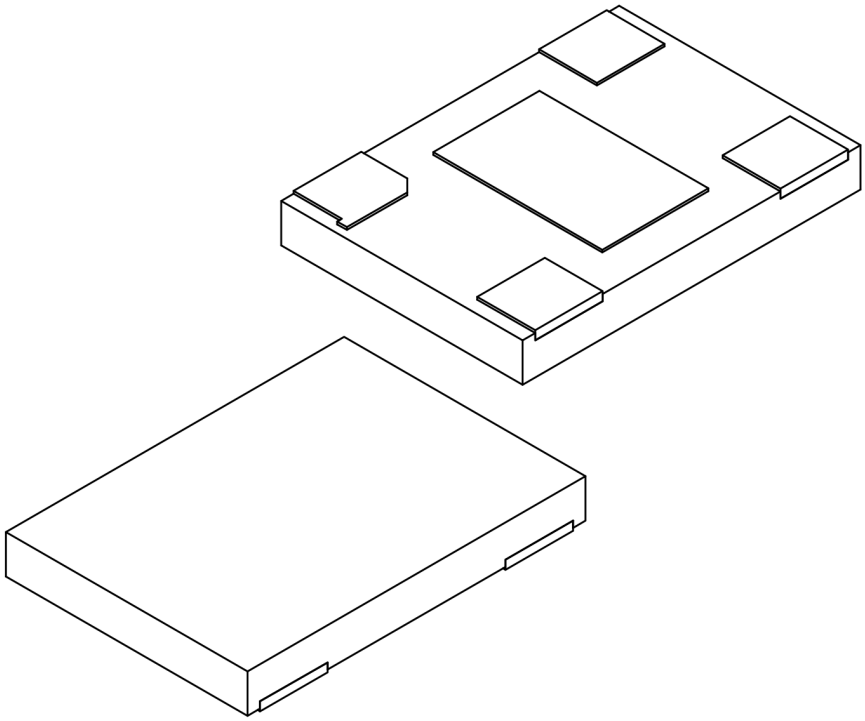
Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-1025 Rev A Sheet 1 of 2

4-Lead Very Thin Dual Flatpack, No Lead Package (JZA) - 7x5x0.9 mm Body [VDFN] With 2.2x3.5 mm Exposed Pad

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



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Terminals	N		004	
Pitch	e		5.08 Ref	
Overall Height	A	0.80	0.85	0.90
Standoff	A1	0.00	-	0.05
Terminal Thickness	A3		0.203 Ref	
Overall Length	D	6.90	7.00	7.10
Exposed Pad Length	D2	2.10	2.20	2.30
Overall Width	E	4.90	5.00	5.10
Exposed Pad Width	E2	3.40	3.50	3.60
Terminal Width	b	1.35	1.40	1.45
Terminal Length	L	1.10	1.20	1.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the pin 1 area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

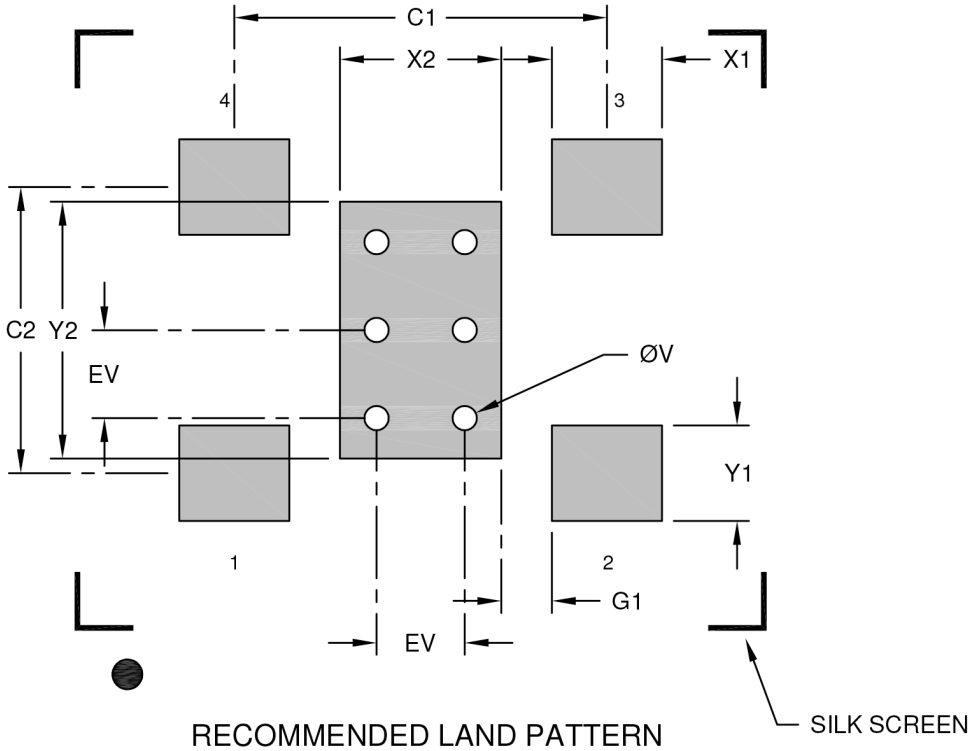
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1025 Rev A Sheet 2 of 2

4-Lead Very Thin Dual Flatpack, No Lead Package [JZA] - 7x5x0.9 mm Body [VDFN] With 2.2x3.5 mm Exposed Pad

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
Optional Center Pad Width	X2			2.30
Optional Center Pad Length	Y2			3.60
Contact Pad Spacing	C1		5.08	
Contact Pad Spacing	C2		3.90	
Contact Pad Width (Xnn)	X1			1.50
Contact Pad Length (Xnn)	Y1			1.30
Contact Pad to Center Pad (Xnn)	G1	0.69		
Thermal Via Diameter	V		0.33	
Thermal Via Pitch	EV		1.20	

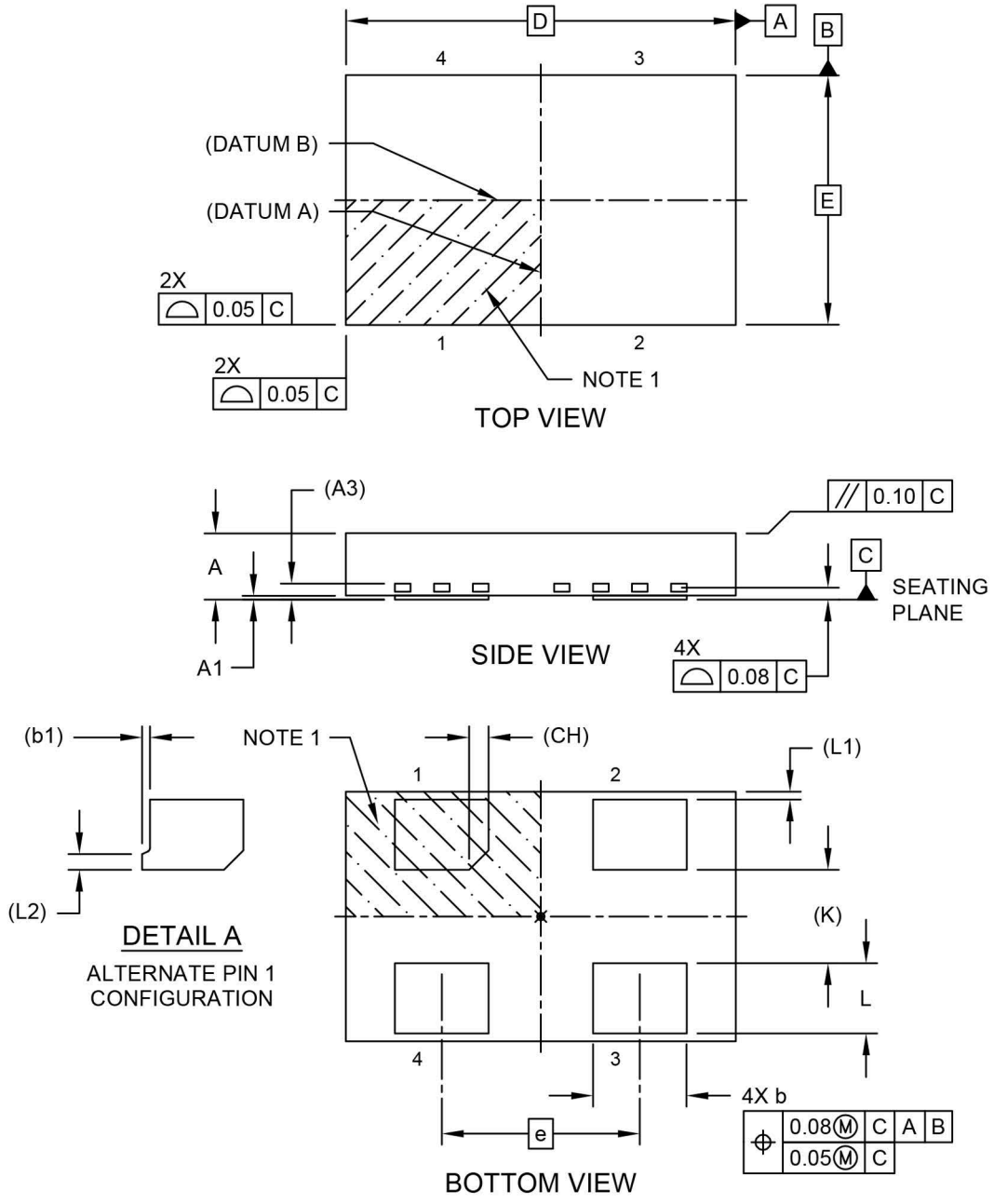
Notes:

1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
2. For best soldering results, thermal vias, if used, should be filled or tented to avoid solder loss during reflow process

Microchip Technology Drawing C04-3025 Rev A

4-Lead Very Thin Plastic Dual Flat, No Lead Package (H6A) - 5x3.2 mm Body [VDFN]

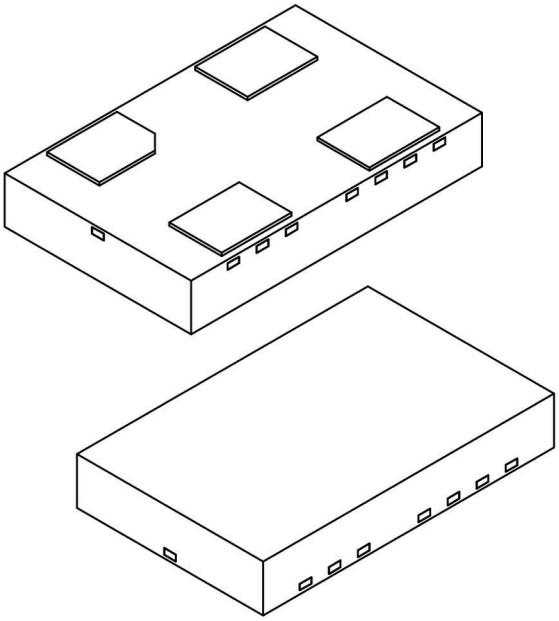
Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-1008 Rev A Sheet 1 of 2

4-Lead Very Thin Plastic Dual Flat, No Lead Package (H6A) - 5x3.2 mm Body [VDFN]

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



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Terminals	N		4	
Pitch	e		2.54 BSC	
Overall Height	A	0.80	0.85	0.90
Standoff	A1	0.00	0.02	0.05
Terminal Thickness	A3		0.20 REF	
Overall Length	D		5.00 BSC	
Overall Width	E		3.20 BSC	
Terminal Width	b	1.15	1.20	1.25
Terminal 1 Tab	b1		0.10 REF	
Terminal Length	L	0.80	0.90	1.00
Terminal Pull Back	L1		0.10 REF	
Terminal 1 Tab	L2		0.20 REF	
Terminal 1 Chamfer	CH		0.25 REF	
Terminal Spacing	K		1.20 REF	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

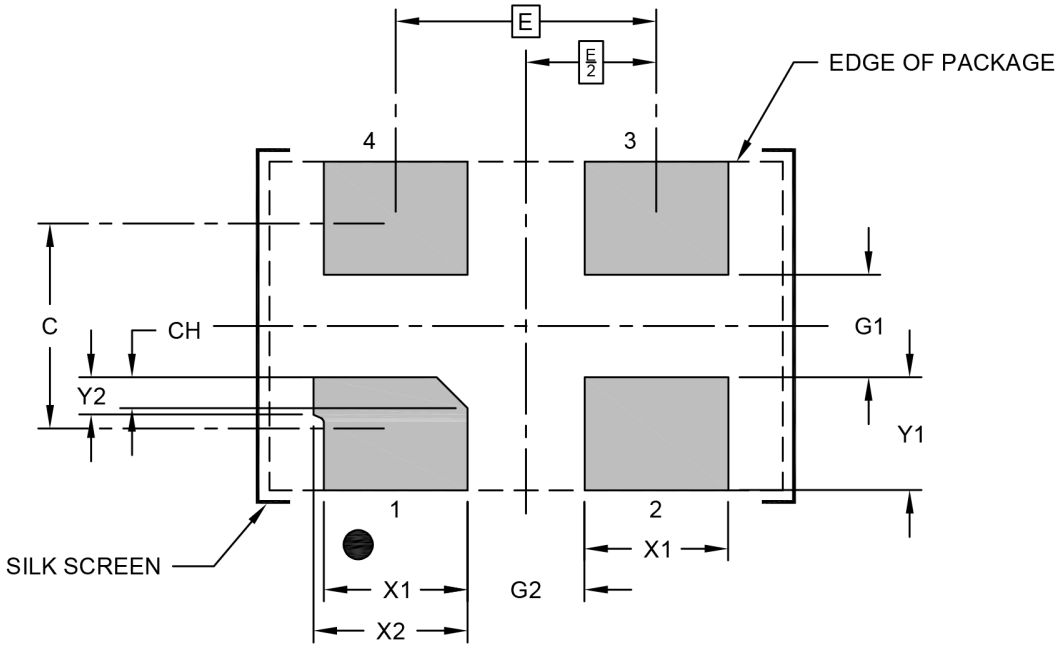
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1008 Rev A Sheet 2 of 2

4-Lead Very Thin Plastic Dual Flat, No Lead Package (H6A) - 5x3.2 mm Body [VDFN]

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			
Contact Pad Spacing	C		2.00	
Contact Pad Width (X4)	X1			1.40
Contact Pad Width	X2			1.50
Contact Pad Length (X4)	Y1			1.10
Contact Pad Tab Length	Y2			0.36
Contact Pad to Center Pad (X2)	G1	1.00		
Contact Pad to Contact Pad (X2)	G2	1.14		
Terminal 1 Contact Pad Chamfer	CH		0.30	

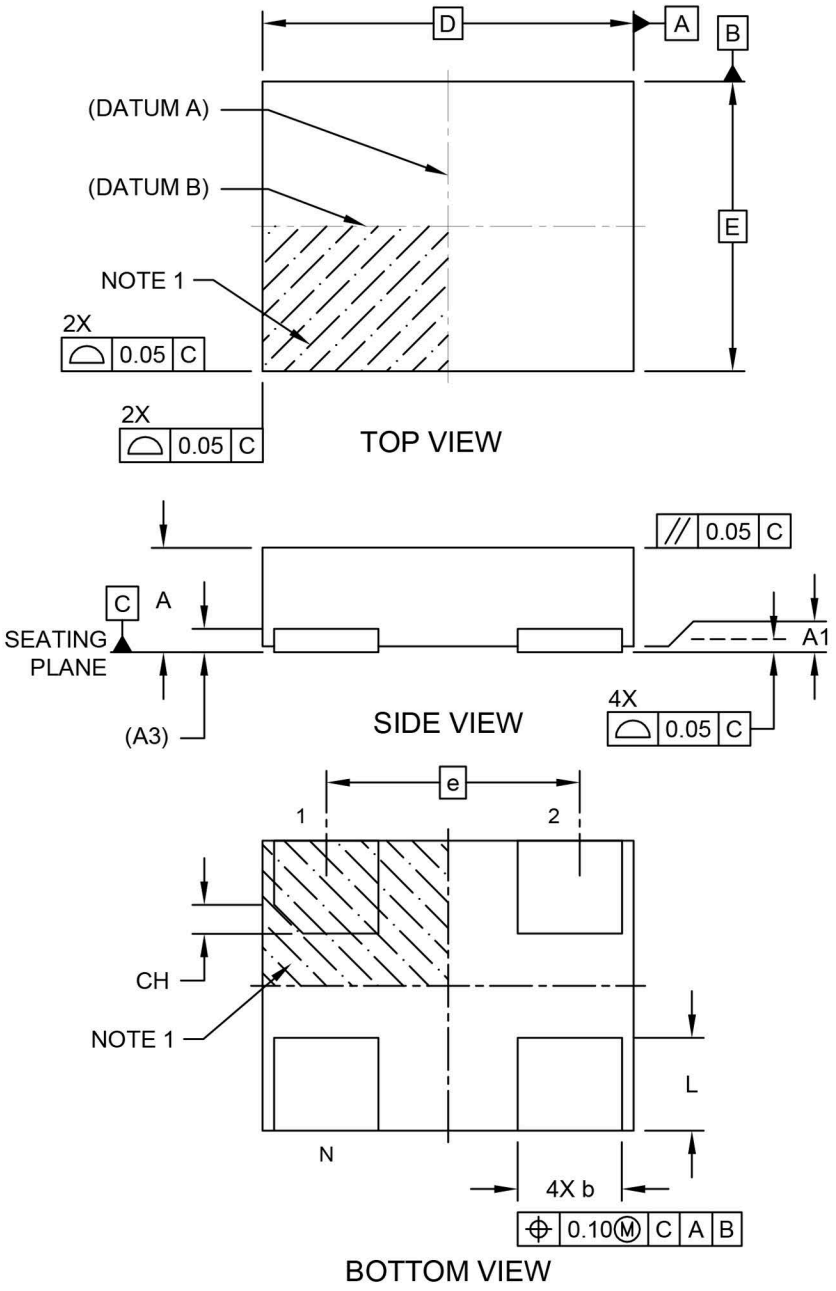
Notes:

1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-3008 Rev A

4-Lead Very Thin Plastic Dual Flatpack No-Lead (H4A) - 3.2x2.5 mm Body [VDFN]

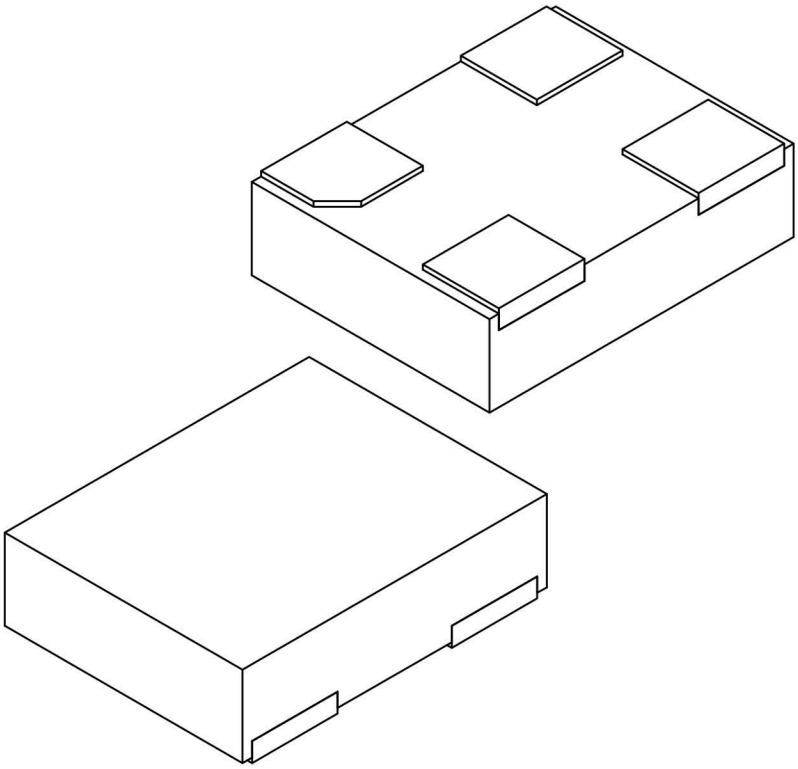
Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-1006 Rev B Sheet 1 of 2

4-Lead Very Thin Plastic Dual Flatpack No-Lead (H4A) - 3.2x2.5 mm Body [VDFN]

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



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Terminals	N		4	
Pitch	e		2.10 BSC	
Overall Height	A	0.80	0.85	0.90
Standoff	A1	0.00	0.02	0.05
Overall Length	D		3.20 BSC	
Overall Width	E		2.50 BSC	
Terminal Width	b	0.85	0.90	0.95
Terminal Length	L	0.70	0.80	0.90
Terminal 1 Index Chamfer	CH		0.25 REF	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

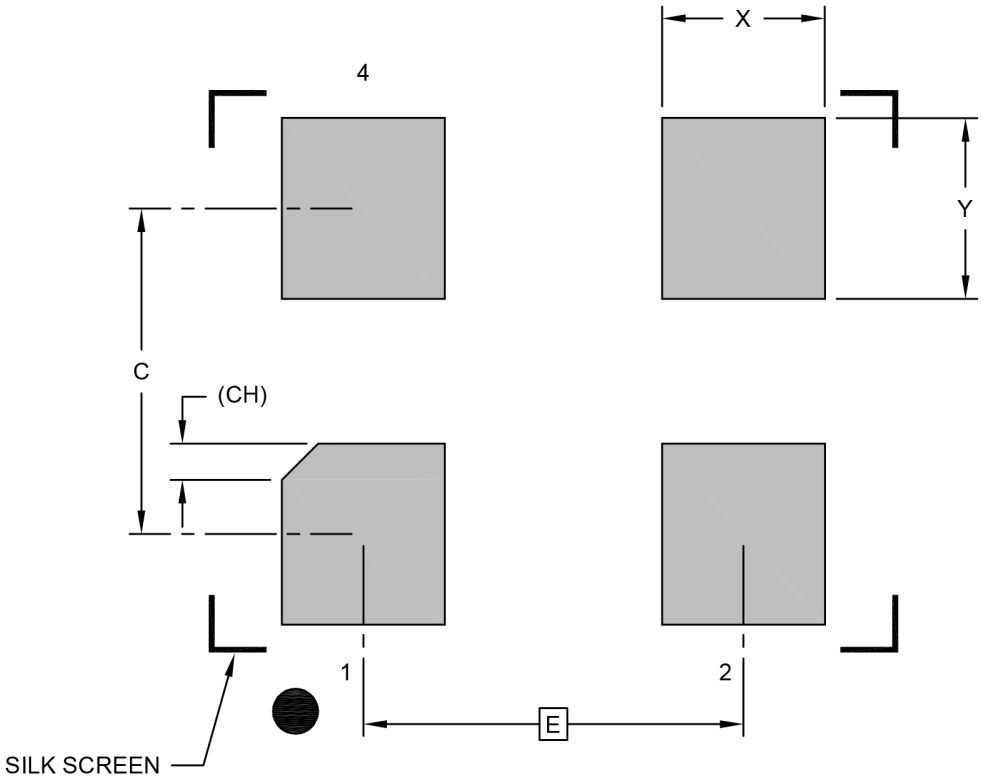
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1006 Rev B Sheet 2 of 2

4-Lead Very Thin Plastic Dual Flatpack No-Lead (H4A) - 3.2x2.5 mm Body [VDFN]

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	2.10 BSC		
Contact Pad Spacing	C		1.80	
Contact Pad Width (Xnn)	X			0.90
Contact Pad Length (Xnn)	Y			1.00
Contact Pad Length (Xnn)	CH	0.20 REF		

Notes:

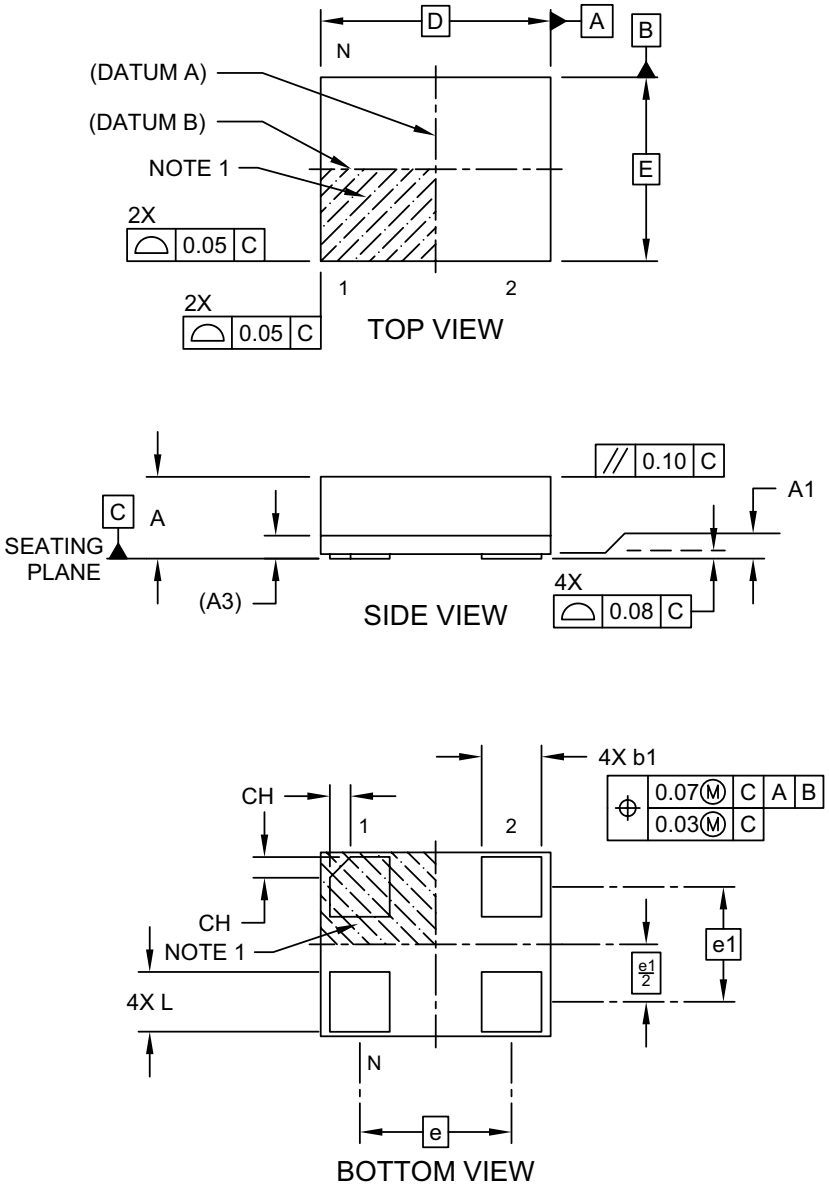
1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-3006 Rev B

4-Lead Very Thin Land Grid Array (AUA) - 2.5x2.0 mm Body [VLGA]

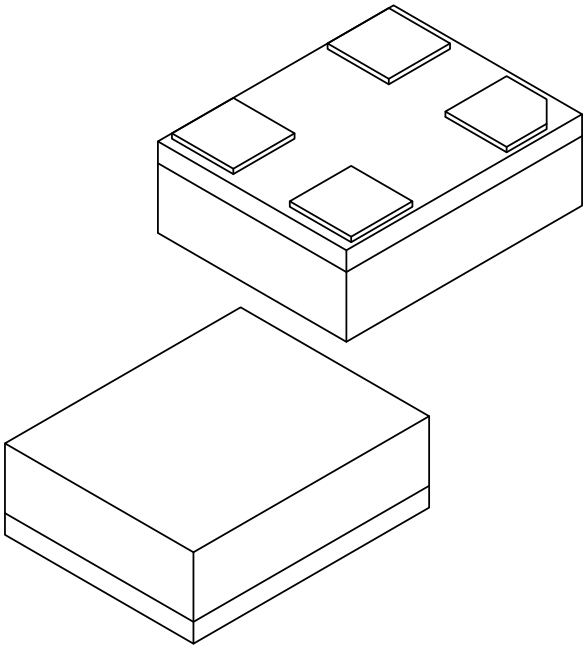
Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-1202B Sheet 1 of 2

4-Lead Very Thin Land Grid Array (AUA) - 2.5x2.0 mm Body [VLGA]

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



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Terminals	N		4	
Terminal Pitch	e		1.65 BSC	
Terminal Pitch	e1		1.25 BSC	
Overall Height	A	0.79	0.84	0.89
Standoff	A1	0.00	0.02	0.05
Substrate Thickness (with Terminals)	A3		0.20 REF	
Overall Length	D		2.50 BSC	
Overall Width	E		2.00 BSC	
Terminal Width	b1	0.60	0.65	0.70
Terminal Length	L	0.60	0.65	0.70
Terminal 1 Index Chamfer	CH	-	0.225	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

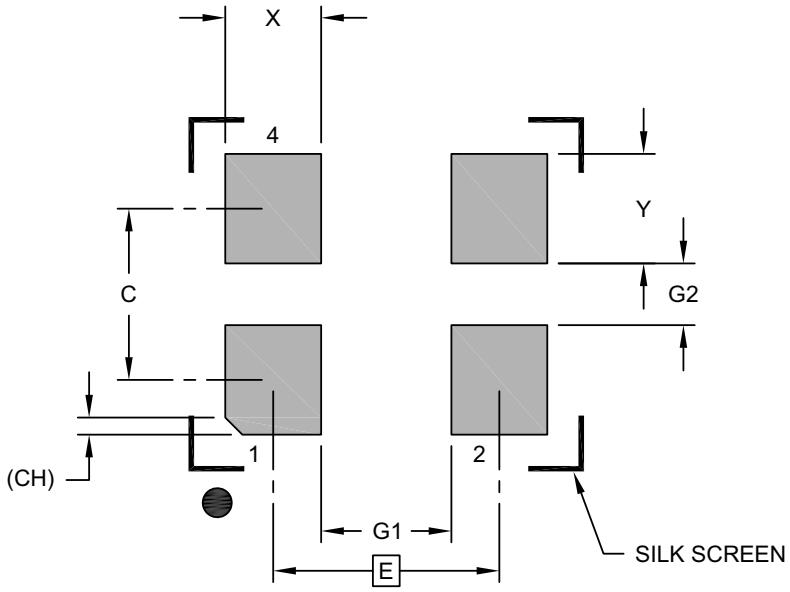
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1202B Sheet 2 of 2

4-Lead Very Thin Land Grid Array (AUA) - 2.5x2.0 mm Body [VLGA]

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	1.65 BSC		
Contact Spacing	C		1.25	
Contact Width (X4)	X			0.70
Contact Pad Length (X4)	Y			0.80
Space Between Contacts (X2)	G1	0.95		
Space Between Contacts (X2)	G2	0.45		
Contact 1 Index Chamfer	CH	0.13 X 45° REF		

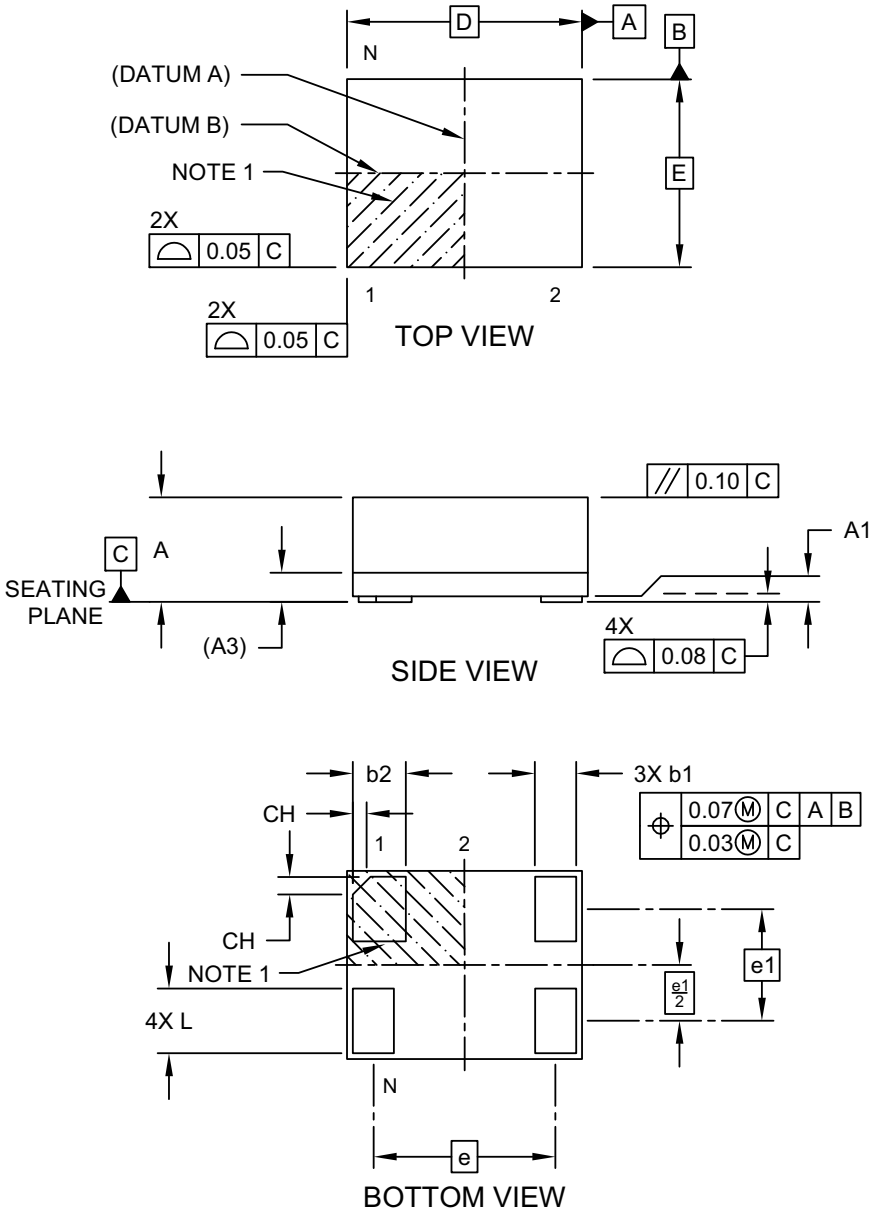
Notes:

1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-3202B

4-Lead Very Thin Fine Pitch Land Grid Array (ASA) - 2.0x1.6 mm Body [VFLGA]

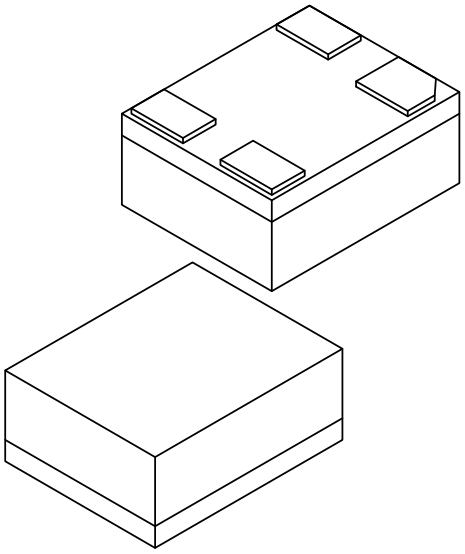
Note: For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-1200 Rev D Sheet 1 of 2

4-Lead Very Thin Fine Pitch Land Grid Array (ASA) - 2.0x1.6 mm Body [VFLGA]

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



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Terminals	N		4	
Terminal Pitch	e		1.55 BSC	
Terminal Pitch	e1		0.95 BSC	
Overall Height	A	0.79	0.84	0.89
Standoff	A1	0.00	0.02	0.05
Substrate Thickness (with Terminals)	A3		0.20 REF	
Overall Length	D		2.00 BSC	
Overall Width	E		1.60 BSC	
Terminal Width	b1	0.30	0.35	0.40
Terminal Width	b2	0.40	0.45	0.50
Terminal Length	L	0.50	0.55	0.60
Terminal 1 Index Chamfer	CH	-	0.15	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

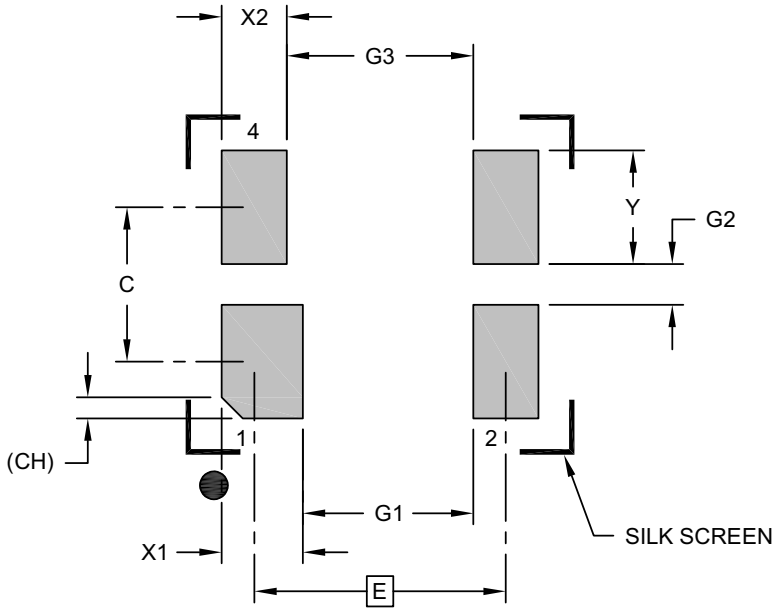
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1200 Rev D Sheet 2 of 2

4-Lead Very Thin Fine Pitch Land Grid Array (ASA) - 2.0x1.6 mm Body [VFLGA]

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		1.55 BSC	
Contact Spacing	C		0.95	
Contact Width	X1			0.50
Contact Width (X3)	X2			0.40
Contact Pad Length (X4)	Y			0.70
Space Between Contacts	G1	1.05		
Space Between Contacts (X2)	G2	0.25		
Space Between Contacts	G3	1.15		
Contact 1 Index Chamfer	CH		0.13 X 45° REF	

Notes:

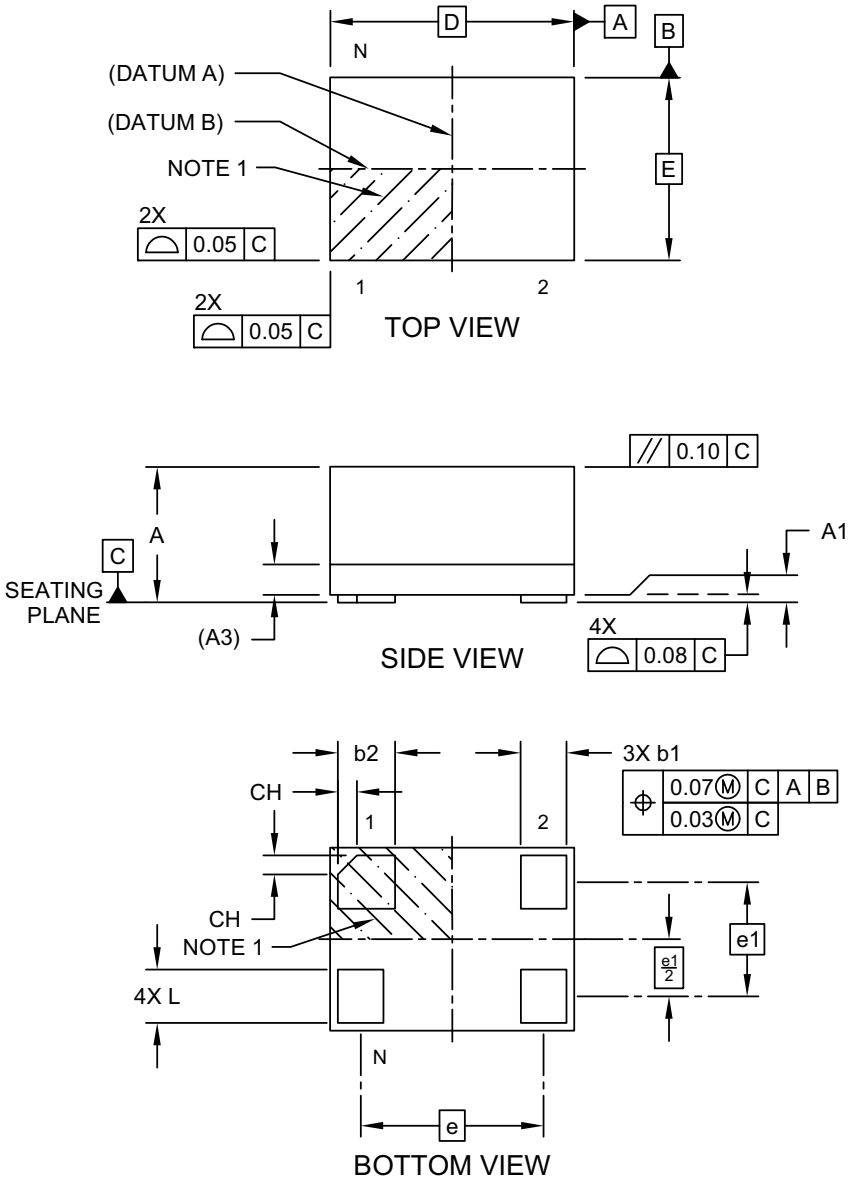
1. Dimensioning and tolerancing per ASME Y14.5M

   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
2. The value in parenthesis, next to the item description is a unit multiplier.

Microchip Technology Drawing C04-3200 Rev D

4-Lead Very Thin Fine Pitch Land Grid Array (ARA) - 1.6x1.2 mm Body [VFLGA]

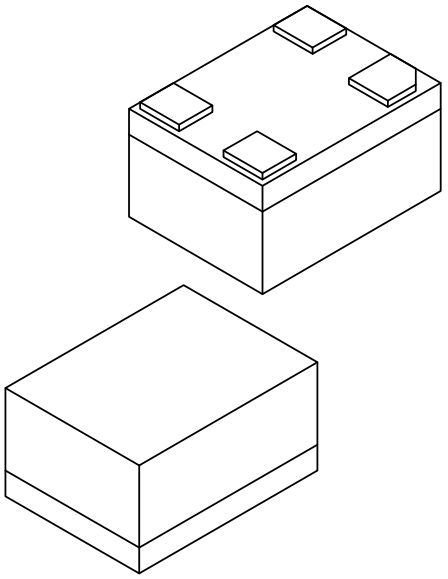
Note:	For the most current package drawings, please see the Microchip Packaging Specification located at http://www.microchip.com/packaging



Microchip Technology Drawing C04-1199B Sheet 1 of 2

4-Lead Very Thin Fine Pitch Land Grid Array (ARA) - 1.6x1.2 mm Body [VFLGA]

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



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Terminals	N		4	
Terminal Pitch	e		1.20 BSC	
Terminal Pitch	e1		0.75 BSC	
Overall Height	A	0.79	0.84	0.89
Standoff	A1	0.00	0.02	0.05
Substrate Thickness (with Terminals)	A3		0.20 REF	
Overall Length	D		1.60 BSC	
Overall Width	E		1.20 BSC	
Terminal Width	b1	0.25	0.30	0.35
Terminal Width	b2	0.325	0.375	0.425
Terminal Length	L	0.30	0.35	0.40
Terminal 1 Index Chamfer	CH	-	0.125	-

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated
3. Dimensioning and tolerancing per ASME Y14.5M

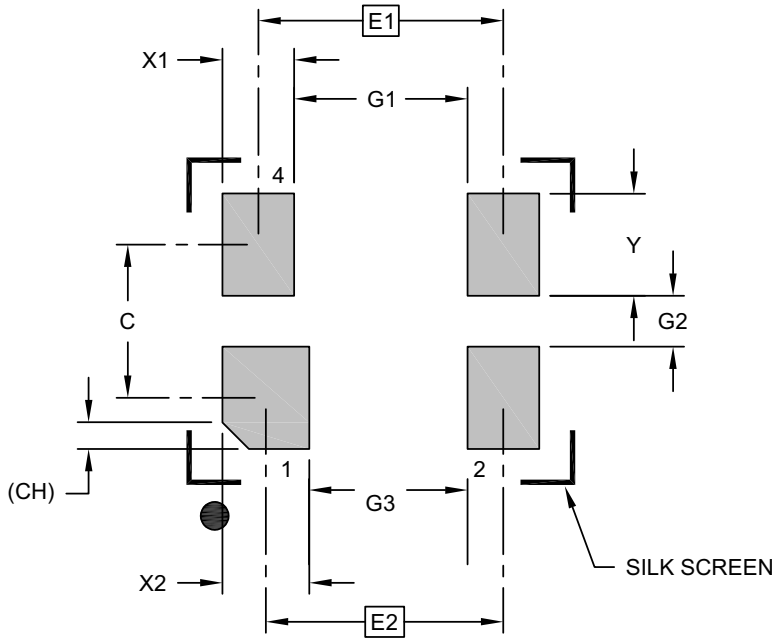
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.

   REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-1199B Sheet 2 of 2

4-Lead Very Thin Fine Pitch Land Grid Array (ARA) - 1.6x1.2 mm Body [VFLGA]

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	E1		1.20 BSC	
Contact Pitch	E2		1.16 BSC	
Contact Spacing	C		0.75	
Contact Width (X3)	X1			0.35
Contact Width	X2			0.43
Contact Pad Length (X4)	Y			0.50
Space Between Contacts	G1	0.85		
Space Between Contacts (X2)	G2	0.25		
Space Between Contacts	G3	0.77		
Contact 1 Index Chamfer	CH		0.13 X 45° REF	

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M
   BSC: Basic Dimension. Theoretically exact value shown without tolerances.
2. The value in parenthesis, next to the item description is a unit multiplier.

Microchip Technology Drawing C04-3199B

NOTES:

APPENDIX A: REVISION HISTORY

Revision A (January 2019)

- Initial creation of DSC61xxB Microchip data sheet DS20006155A.

Revision B (December 2021)

- Replaced all three package drawings with the most current versions.

Revision C (November 2022)

- Added the 7.0 mm x 5.0 mm VDFN, 5.0 mm x 3.2 mm VDFN, and 3.2 mm x 2.5 mm VDFN package options throughout the document.
- Updated the previously existing package outline drawings to their most current versions.

NOTES:

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, contact your local Microchip representative or sales office.

PART NO.	X	X	X	X	X	X –	XXX.XXXX	X
Device	Pin 1 Definition	Output Drive Strength	Package	Temperature Range	Frequency Stability	Revision	Frequency	Media Type

Device:	DSC61:	Ultra-Small, Ultra-Low Power MEMS Oscillator	
Pin Definition:	**Selection**	**Pin 1**	**Internal Pull-Up Register**
	0	OE	Pull-up
	1	$\overline{\text{STDBY}}$	Pull-up
	2	FS	Pull-up
	4	OE	None
	5	$\overline{\text{STDBY}}$	None
	6	FS	None
Output Drive Strength:	1	Standard	
	2	High	
Packages:	A =	4-Lead 7.0 mm x 5.0 mm VDFN	
	B =	4-Lead 5.0 mm x 3.2 mm VDFN	
	C =	4-Lead 3.2 mm x 2.5 mm VDFN	
	J =	4-Lead 2.5 mm x 2.0 mm VLGA	
	M =	4-Lead 2.0 mm x 1.6 mm VLGA	
	H =	4-Lead 1.6 mm x 1.2 mm VFLGA	
Temperature Range:	A =	–40°C to +125°C (Automotive)	
	L =	–40°C to +105°C (Extended Industrial)	
	I =	–40°C to +85°C (Industrial)	
	E =	–20°C to +70°C (Extended Commercial)	
Frequency Stability:	1 =	± 50 ppm	
	2 =	± 25 ppm	
	3 =	± 20 ppm	
Revision:	B =	Revision B	
Frequency:	xxx.xxxx =	User-Defined Frequency between 001.0000 MHz and 100.0000 MHz	
	xxxkxxx =	User-Defined Frequency between 003.500 kHz and 999.999 kHz	
	xxxx =	Frequency configuration code when pin 1 = FS. Configure the part online through ClockWorks	
Media Type:	<blank>=	50/Tube, 100 pce. min. (A Package Option)	
	<blank>=	72/Tube, 144 pce. min. (B Package Option)	
	<blank>=	110/Tube (C Package Option)	
	<blank>=	140/Tube (J Package Option)	
	<blank>=	100/Bag (M & H Package Option)	
	T =	1,000/Reel	
	B =	3,000/Reel	

Examples:

a) DSC6112JI2B-100.0000:
Ultra-Small, Ultra-Low Power MEMS Oscillator, Pin 1 = $\overline{\text{STDBY}}$ with Internal Pull-Up, High Drive Strength, 4-Lead 2.5 mm x 2.0 mm VLGA, Industrial Temperature, ±25 ppm Stability, Revision B, 100 MHz Frequency, 140/Tube

b) DSC6101HE1B-016.0000T:
Ultra-Small, Ultra-Low Power MEMS Oscillator, Pin 1 = OE with Internal Pull-Up, Standard Drive Strength, 4-Lead 1.6 mm x 1.2 mm VFLGA, Extended Commercial Temperature, ±50 ppm Stability, Revision B, 16 MHz Frequency, 1,000/Reel

c) DSC6121MI2B-005QB:
Ultra-Small, Ultra-Low Power MEMS Oscillator, Pin 1 = Freq. Select with Internal Pull-Up, Standard Drive Strength, 4-Lead 2.0 mm x 1.6 mm VLGA, Industrial Temperature, ±25 ppm Stability, Revision B, Two Frequencies Configured through ClockWorks, 3,000/Reel

Note 1: Media Type identifier only appears in the catalog part number description. This identifier is used for ordering purposes and is not printed on the device package. Check with your Microchip Sales Office for package availability with different media options.

Note 1: Please visit Microchip ClockWorks® Configurator Website to configure the part number for customized frequency. http://clockworks.microchip.com/timing/.

NOTES:

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- Microchip products meet the specifications contained in their particular Microchip Data Sheet.
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Sweden - Stockholm
Tel: 46-8-5090-4654

UK - Wokingham
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Fax: 44-118-921-5820

SYST-29QVOH022 - Data Ultra-Low Power MEMS Oscillator

Affected Catalog Part Numbers(CPN)

DSC6101HA2B-072.0000
DSC6101HA3B-PROG
DSC6101HA2B-072.5000
DSC6101HA3B-024.0000
DSC6111HA3B-024.0000
DSC6111HA2B-024.0000
DSC6101MA3B-019.2000
DSC6101MA3B-027.0000
DSC6101MA3B-PROG
DSC6111MA3B-050.0000
DSC6101MA2B-020.0000
DSC6111MA1B-033.0000
DSC6101MA3B-016.6666
DSC6111MA1B-033.3300
DSC6101MA3B-026.0000
DSC6101MA1B-008.0000
DSC6101JA2B-025.0000
DSC6101JA2B-027.0000
DSC6101JA3B-PROG
DSC6102JA1B-125K000
DSC6102JA1B-010K000
DSC6101JA2B-050.0000
DSC6101JA3B-024.0000
DSC6101HI3B-019.2000
DSC6112HI2B-001.0000
DSC6111HI2B-032K768
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DSC6111HI2B-720K000
DSC6112HI2B-032K768
DSC6112HI2B-250K000
DSC6112HI2B-432K000
DSC6112HI2B-720K000
DSC6111HI2B-004K000
DSC6112HI2B-004K000
DSC6111HI3B-010.0000
DSC6111HI1B-032K768
DSC6101HI2B-080.0000
DSC6102HI2B-025.0000
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