



Packaging Specification

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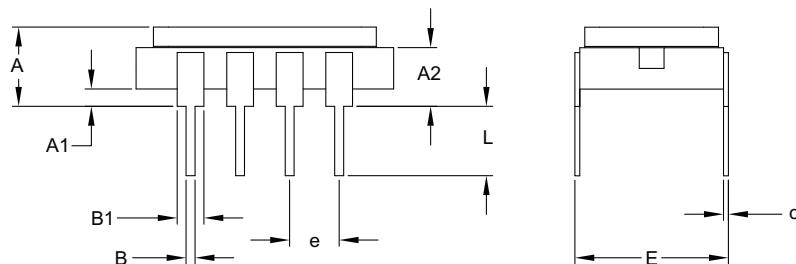
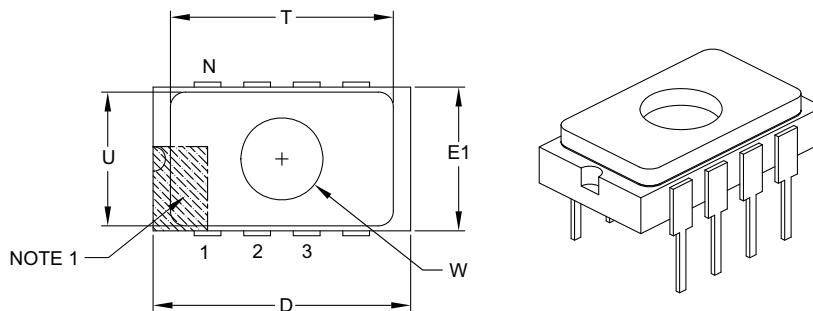
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Packaging Diagrams and Parameters

8-Lead Ceramic Side Brazed Dual In-Line with Window (JW) – .300" Body

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		.100 BSC	
Top to Seating Plane	A	.085	—	.200
Top of Body to Seating Plane	A2	.103	—	.143
Standoff	A1	.025	—	.070
Package Width	E1	.280	—	.310
Overall Length	D	.500	—	.540
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	B1	.045	—	.065
Lower Lead Width	B	.015	—	.022
Overall Row Spacing §	E	.300	—	.325
Window Diameter	W	.161	—	.171
Lid Length	T	.440	—	.460
Lid Width	U	.260	—	.280

Notes:

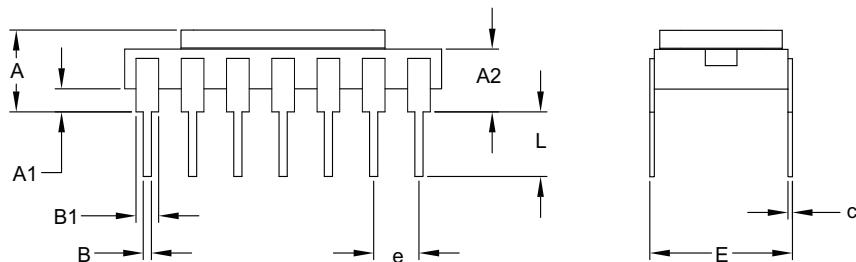
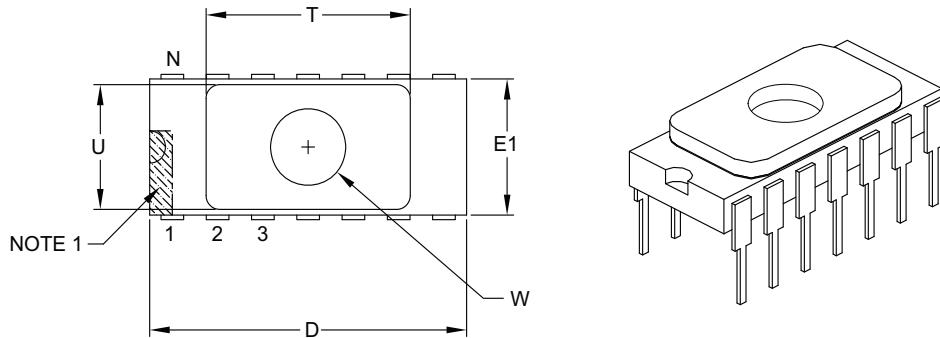
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include burrs and/or projections of package material. These particles shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

14-Lead Ceramic Side Brazed Dual In-Line with Window (JW) – .300" Body

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



		Units	INCHES		
		Dimension Limits	MIN	NOM	MAX
Number of Pins	N			14	
Pitch	e			.100 BSC	
Top to Seating Plane	A	.085	–	.200	
Top of Body to Seating Plane	A2	.100	–	.140	
Standoff	A1	.025	–	.070	
Package Width	E1	.280	–	.310	
Overall Length	D	.693	–	.770	
Tip to Seating Plane	L	.125	–	.200	
Lead Thickness	c	.008	–	.015	
Upper Lead Width	B1	.045	–	.065	
Lower Lead Width	B	.015	–	.022	
Overall Row Spacing §	E	.300	–	.325	
Window Diameter	W	.161	–	.171	
Lid Length	T	.440	–	.460	
Lid Width	U	.260	–	.280	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include burrs and/or projections of package material. These particles shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

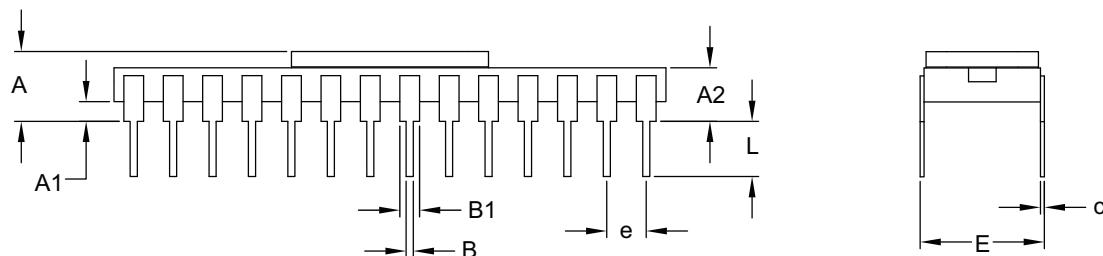
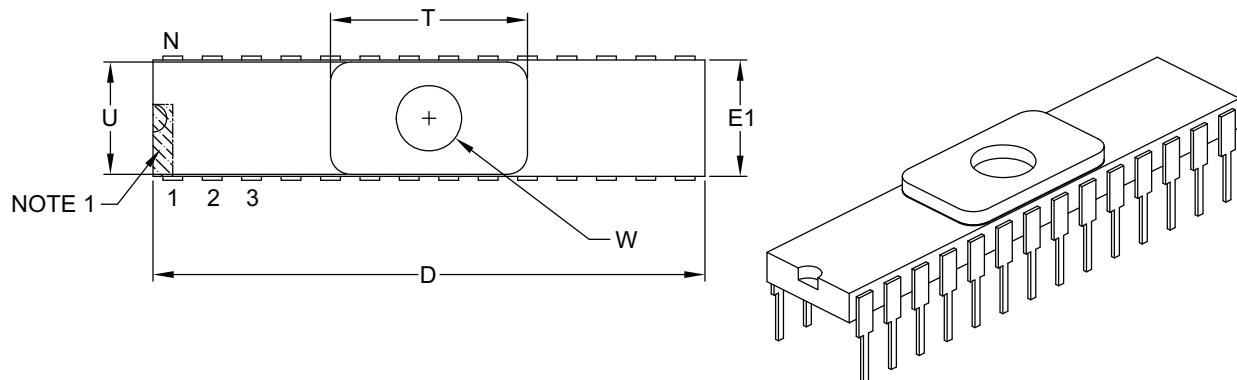
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-107B

Packaging Diagrams and Parameters

28-Lead Ceramic Side Braze Dual In-Line with Window (JW) – .300" Body

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.100 BSC	
Top to Seating Plane	A	.085	—	.200
Top of Body to Seating Plane	A2	.115	—	.155
Standoff	A1	.025	—	.070
Package Width	E1	.280	—	.310
Overall Length	D	1.380	—	1.420
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	B1	.045	—	.065
Lower Lead Width	B	.015	—	.022
Overall Row Spacing §	E	.300	—	.325
Window Diameter	W	.161	—	.171
Lid Length	T	.490	—	.510
Lid Width	U	.275	—	.295

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include burrs and/or projections of package material. These particles shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

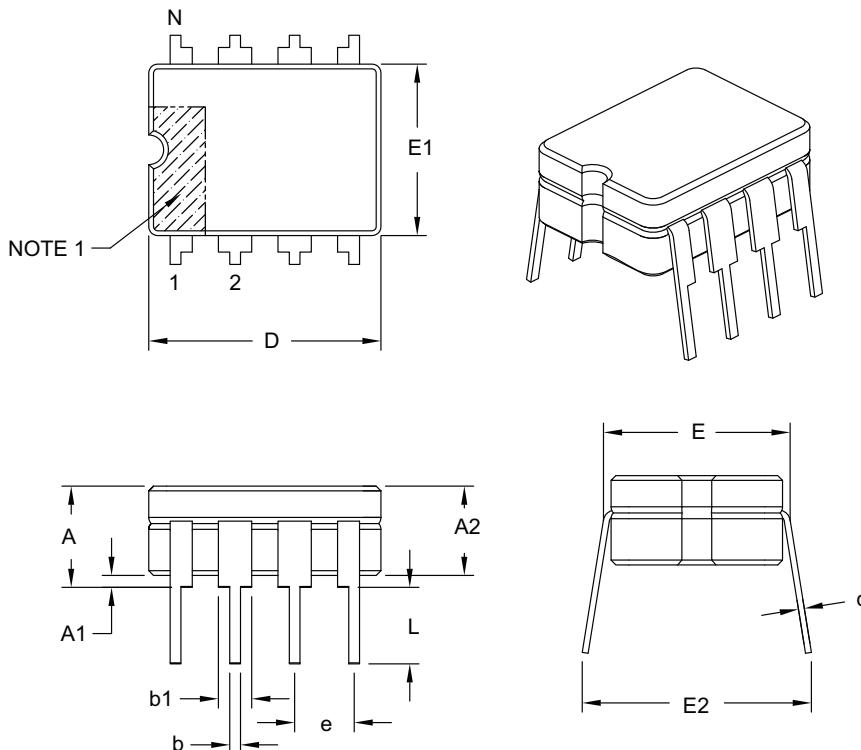
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-084B

Packaging Diagrams and Parameters

8-Lead Ceramic Dual In-Line (JA) – .300" Body [CERDIP]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N		8		
Pitch	e		.100	BSC	
Top to Seating Plane	A	—	—	.200	
Standoff §	A1	.015	—	—	
Ceramic Package Height	A2	.140	—	.175	
Shoulder to Shoulder Width	E	.290	—	.320	
Ceramic Package Width	E1	.230	.248	.300	
Overall Length	D	.370	.380	.400	
Tip to Seating Plane	L	.125	—	.200	
Lead Thickness	c	.008	—	.015	
Upper Lead Width	b1	.045	—	.065	
Lower Lead Width	b	.015	—	.023	
Overall Row Spacing	E2	.314	—	.410	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

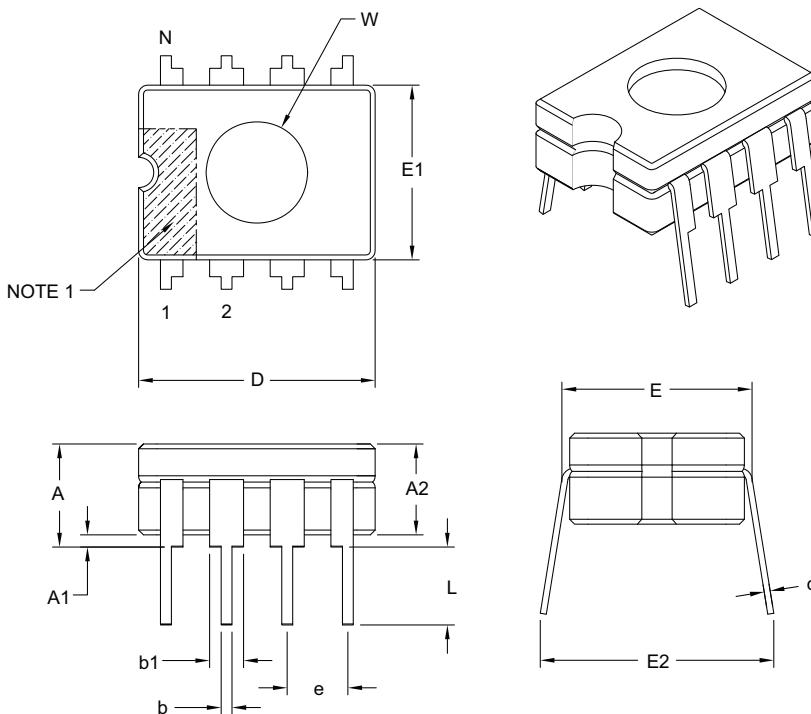
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-001B

Packaging Diagrams and Parameters

8-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		8	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.200
Standoff §	A1	.015	—	—
Ceramic Package Height	A2	.140	—	.175
Shoulder to Shoulder Width	E	.290	—	.320
Ceramic Package Width	E1	.230	.248	.300
Overall Length	D	.370	.380	.400
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.045	—	.065
Lower Lead Width	b	.015	—	.023
Overall Row Spacing	E2	.314	—	.410
Window Diameter	W	.267	.270	.273

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

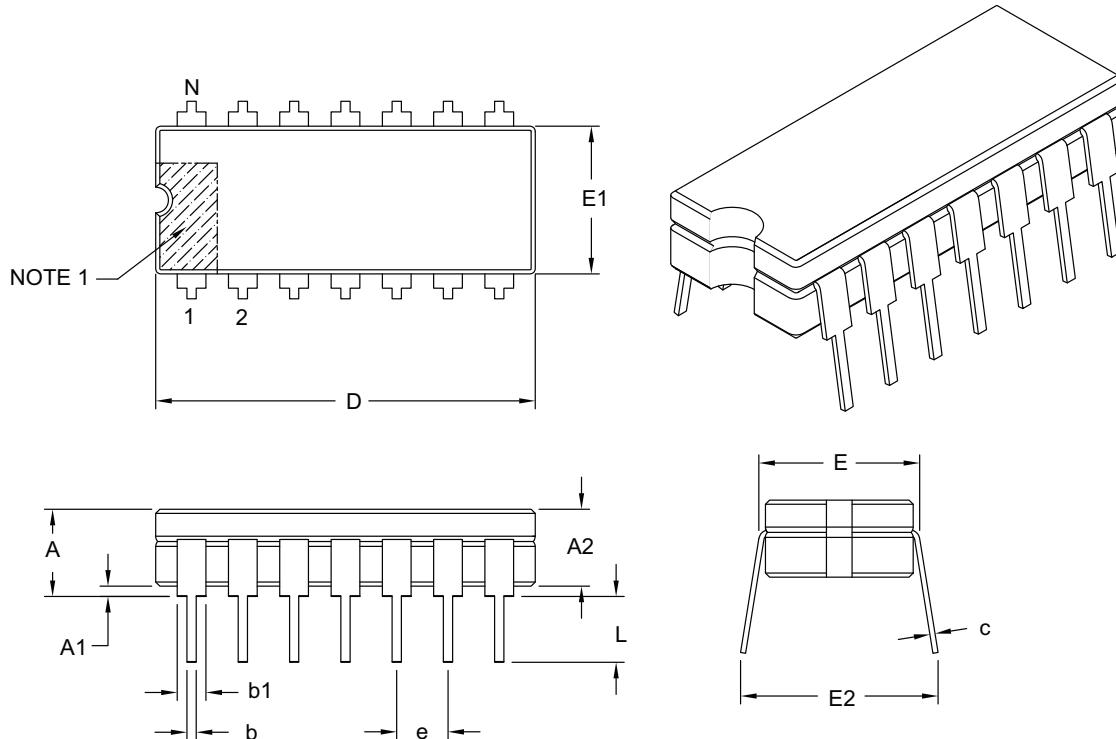
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-027B

Packaging Diagrams and Parameters

14-Lead Ceramic Dual In-Line (JD) – .300" Body [CERDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		14	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.200
Standoff §	A1	.015	—	—
Ceramic Package Height	A2	.140	—	.175
Shoulder to Shoulder Width	E	.290	—	.325
Ceramic Package Width	E1	.230	.288	.300
Overall Length	D	.740	.760	.780
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.045	—	.065
Lower Lead Width	b	.015	—	.023
Overall Row Spacing	E2	.320	—	.410

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

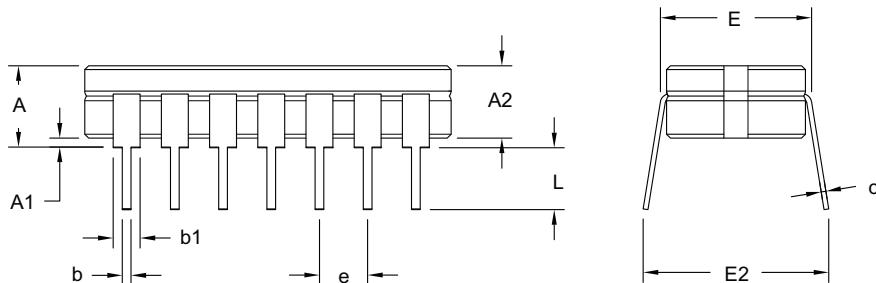
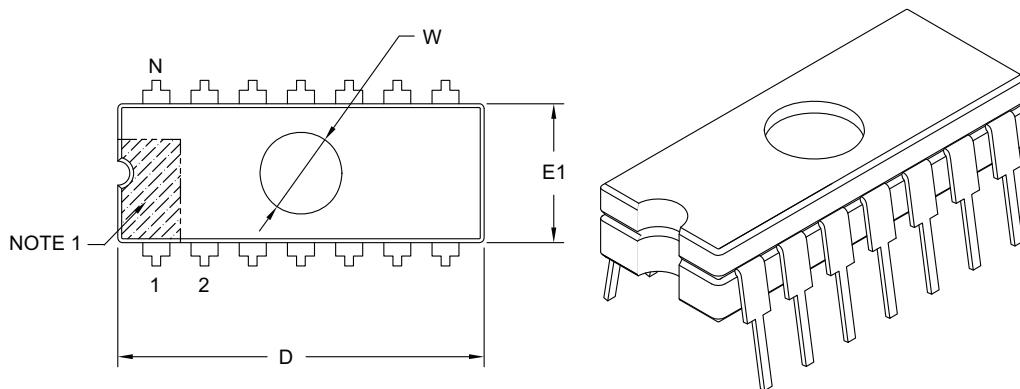
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-002B

Packaging Diagrams and Parameters

14-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			14	
Pitch	e			.100 BSC	
Top to Seating Plane	A	—	—	.200	
Standoff §	A1	.015	—	—	
Ceramic Package Height	A2	.140	—	.175	
Shoulder to Shoulder Width	E	.290	—	.325	
Ceramic Package Width	E1	.230	.288	.300	
Overall Length	D	.740	.760	.780	
Window Diameter	W	.125	.170	.210	
Tip to Seating Plane	L	.125	—	.200	
Lead Thickness	c	.008	—	.015	
Upper Lead Width	b1	.045	—	.065	
Lower Lead Width	b	.015	—	.023	
Overall Row Spacing	E2	.320	—	.410	

Notes:

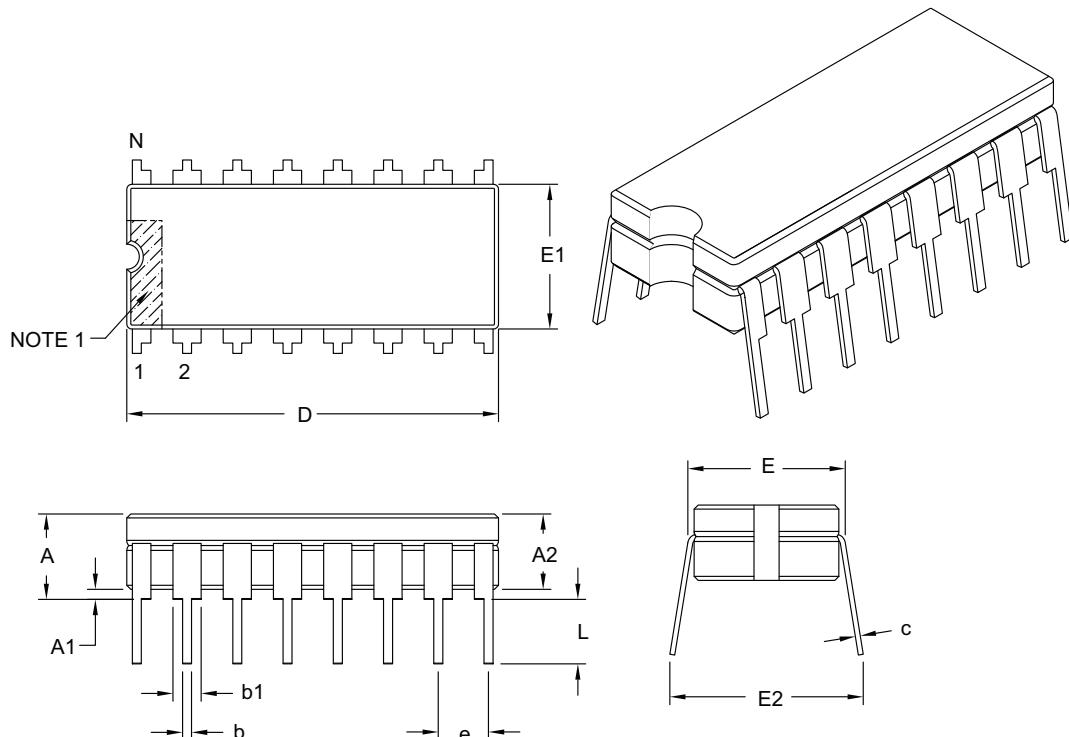
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

16-Lead Ceramic Dual In-Line (JE) – .300" Body [CERDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins		N		
Pitch		e		
Top to Seating Plane	A	—	—	.200
Standoff §	A1	.015	—	—
Ceramic Package Height	A2	.140	—	.175
Shoulder to Shoulder Width	E	.290	—	.325
Ceramic Package Width	E1	.245	.288	.300
Overall Length	D	.740	.760	.780
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.045	—	.065
Lower Lead Width	b	.015	—	.023
Overall Row Spacing	E2	.320	—	.410

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

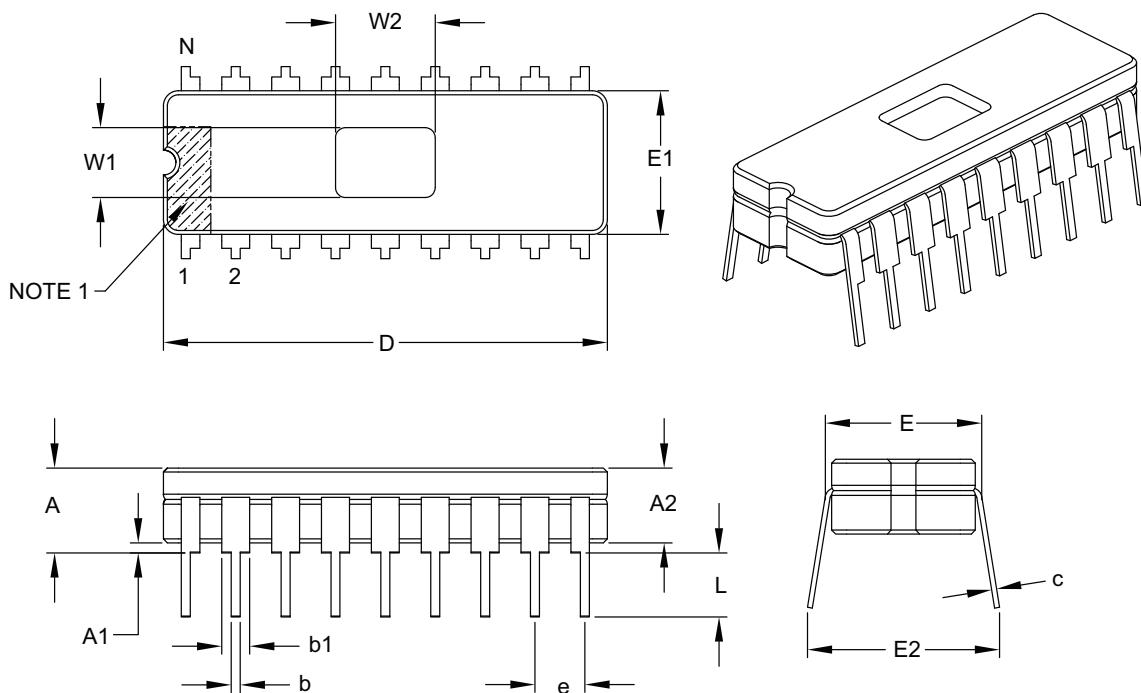
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-003B

Packaging Diagrams and Parameters

18-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

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



Dimension Limits		INCHES		
	N	MIN	NOM	MAX
Number of Pins	N		18	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.200
Ceramic Package Height	A2	.140	—	.175
Standoff §	A1	.015	—	—
Shoulder to Shoulder Width	E	.308	—	.325
Ceramic Package Width	E1	.280	.288	.296
Overall Length	D	.882	.890	.910
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.014
Upper Lead Width	b1	.045	—	.065
Lower Lead Width	b	.015	—	.023
Overall Row Spacing	E2	.325	—	.410
Window Width	W1	.130	.140	.150
Window Length	W2	.190	.200	.210

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

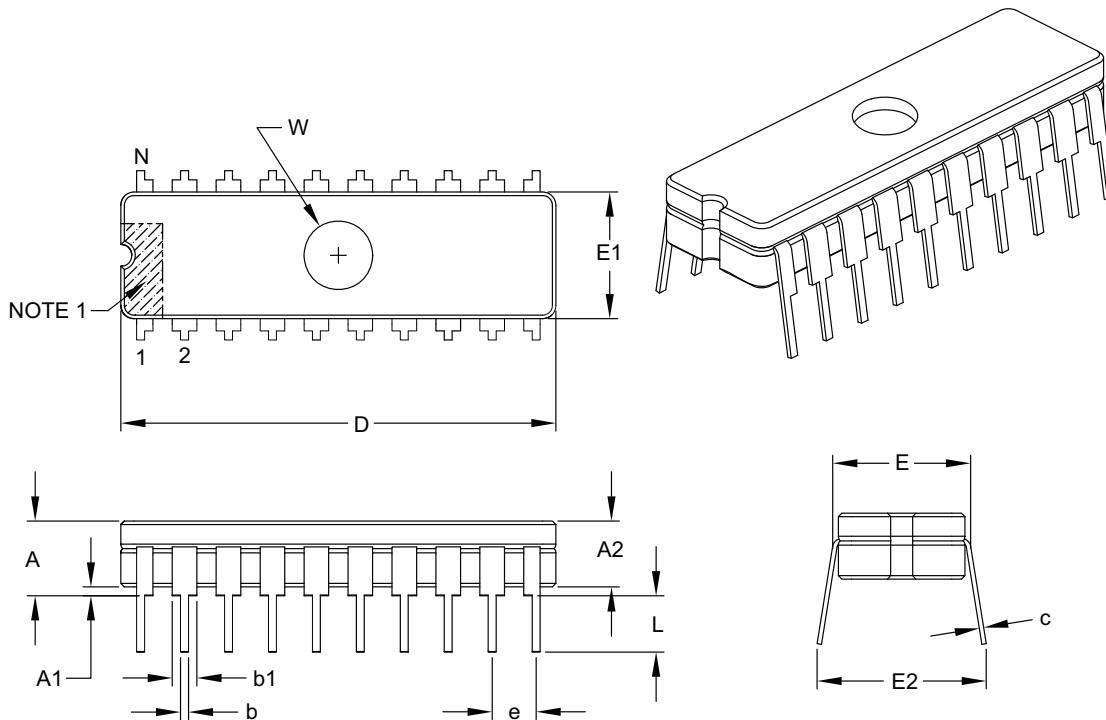
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-010B

Packaging Diagrams and Parameters

20-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	20		
Pitch	e	.100 BSC		
Top to Seating Plane	A	—	—	.200
Ceramic Package Height	A2	.140	—	.175
Standoff §	A1	.015	—	—
Shoulder to Shoulder Width	E	.308	—	.325
Ceramic Package Width	E1	.280	.288	.296
Overall Length	D	.942	.950	.970
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.014
Upper Lead Width	b1	.045	—	.065
Lower Lead Width	b	.015	—	.023
Overall Row Spacing	E2	.325	—	.410
Window Diameter	W	.167	.170	.173

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

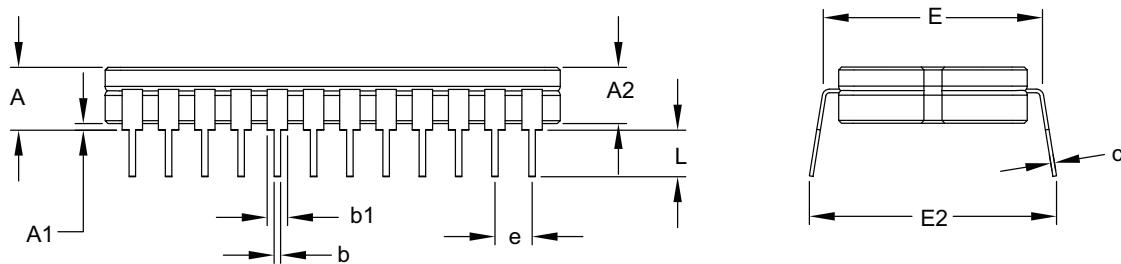
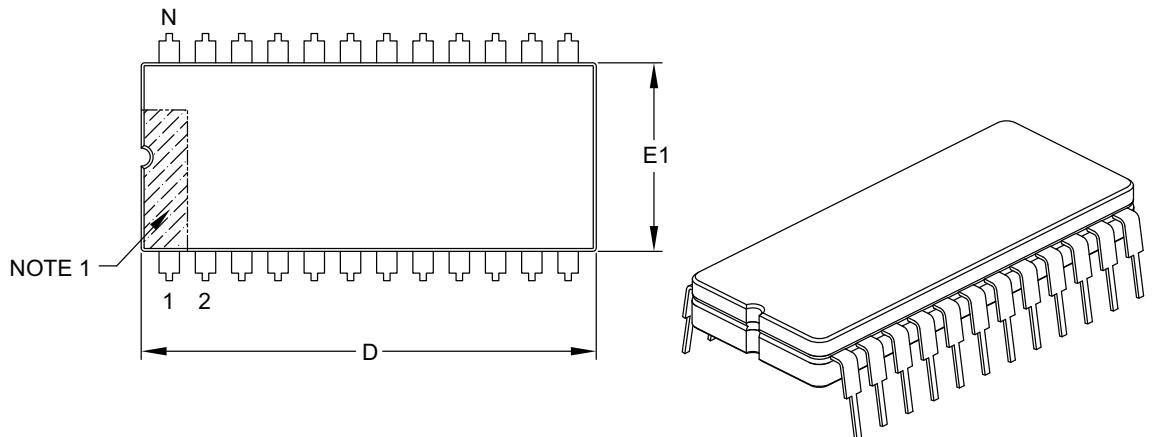
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-115B

Packaging Diagrams and Parameters

24-Lead Ceramic Dual In-Line (JG) – .600" Body [CERDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		24	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.225
Ceramic Package Height	A2	.140	—	.175
Standoff §	A1	.015	—	—
Shoulder to Shoulder Width	E	.590	—	.625
Ceramic Package Width	E1	.510	.520	.540
Overall Length	D	1.240	1.250	1.270
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.045	—	.065
Lower Lead Width	b	.015	—	.023
Overall Row Spacing	E2	.620	—	.710

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

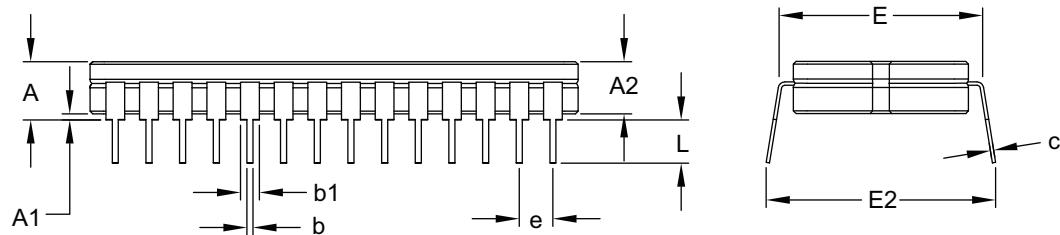
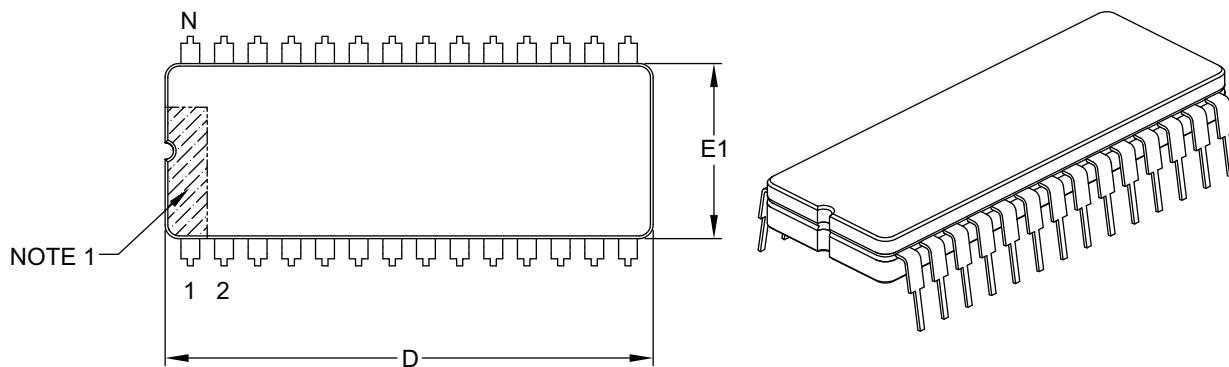
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-004B

Packaging Diagrams and Parameters

28-Lead Ceramic Dual In-Line (JN) – .600" Body [CERDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	.100 BSC		
Top to Seating Plane	A	–	–	.225
Ceramic Package Height	A2	.140	–	.175
Standoff §	A1	.015	–	–
Shoulder to Shoulder Width	E	.590	–	.625
Ceramic Package Width	E1	.510	.520	.540
Overall Length	D	1.440	1.450	1.470
Tip to Seating Plane	L	.125	–	.200
Lead Thickness	c	.008	–	.015
Upper Lead Width	b1	.045	–	.065
Lower Lead Width	b	.015	–	.023
Overall Row Spacing	E2	.620	–	.710

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

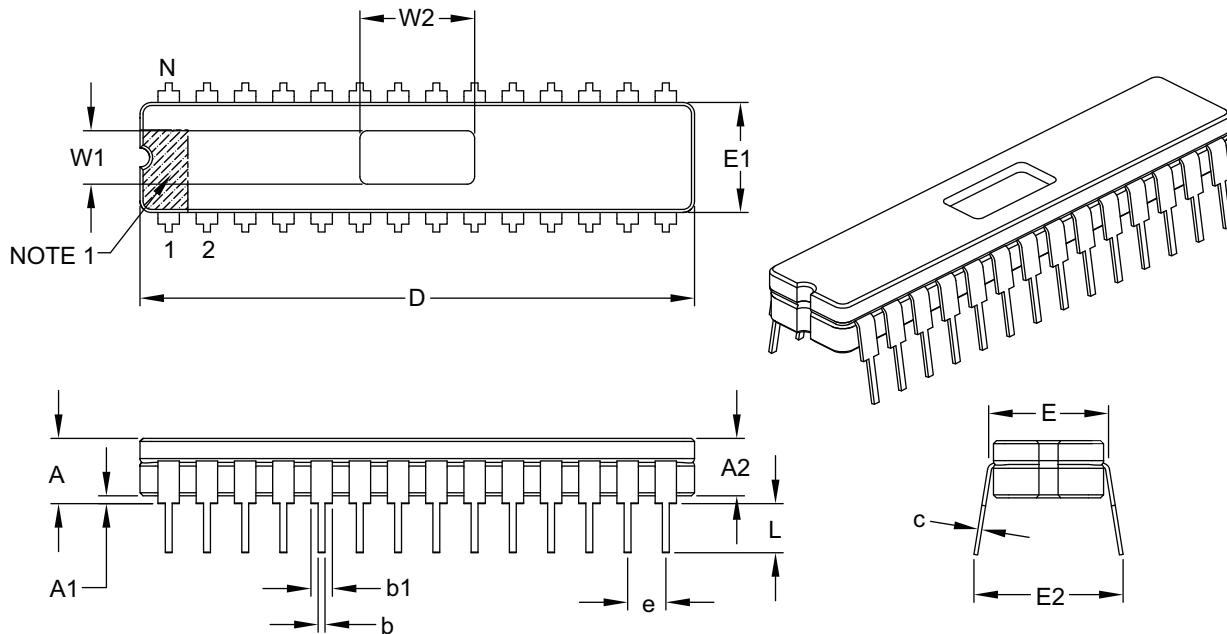
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-006B

Packaging Diagrams and Parameters

28-Lead Ceramic Dual In-Line with Window (JW) – .300" Body [CERDIP]

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



Dimension Limits	Units	INCHES		
	N	MIN	NOM	MAX
Number of Pins	28			
Pitch	e	.100	BSC	
Top to Seating Plane	A	—	—	.200
Ceramic Package Height	A2	.140	—	.175
Standoff §	A1	.015	—	—
Shoulder to Shoulder Width	E	.308	—	.325
Ceramic Package Width	E1	.280	.288	.296
Overall Length	D	1.442	1.450	1.470
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.014
Upper Lead Width	b1	.045	—	.065
Lower Lead Width	b	.015	—	.023
Overall Row Spacing	E2	.325	—	.410
Window Width	W1	.130	.140	.150
Window Length	W2	.290	.300	.310

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

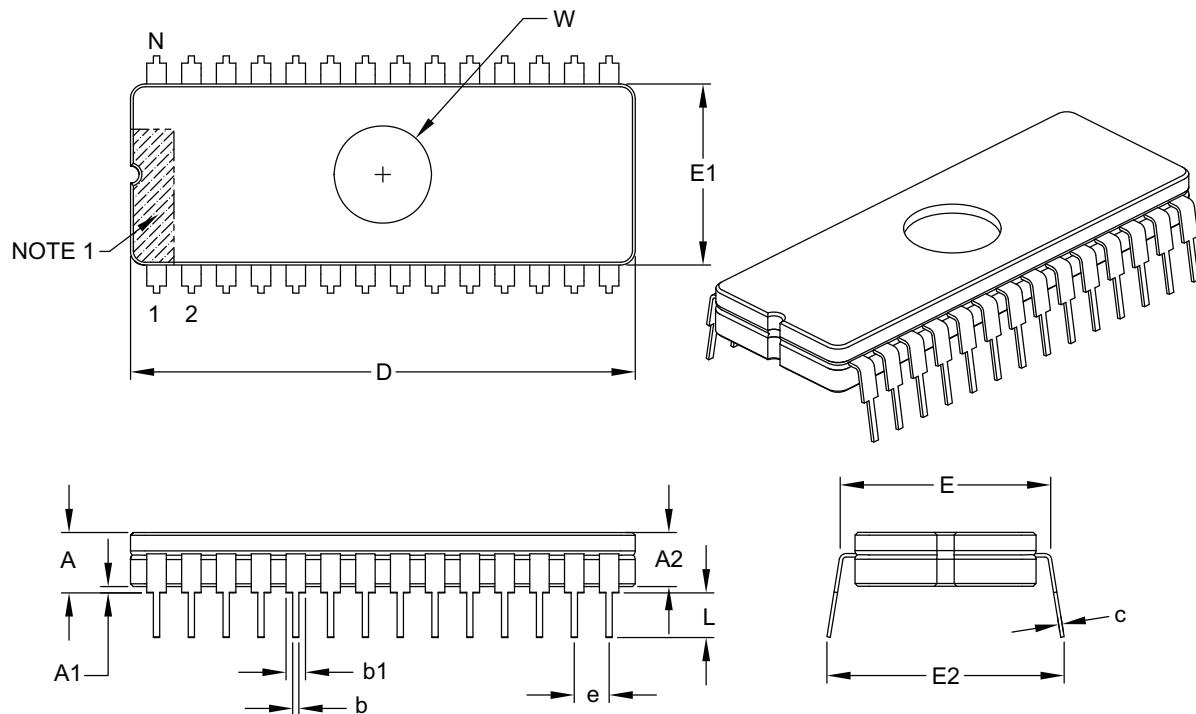
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-080B

Packaging Diagrams and Parameters

28-Lead Ceramic Dual In-Line with Window (JW) – .600" Body [CERDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	.100	BSC	
Top to Seating Plane	A	—	—	.225
Ceramic Package Height	A2	.140	—	.175
Standoff §	A1	.015	—	—
Shoulder to Shoulder Width	E	.590	—	.625
Ceramic Package Width	E1	.510	.520	.540
Overall Length	D	1.440	1.450	1.470
Tip to Seating Plane	L	.125	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.045	—	.065
Lower Lead Width	b	.015	—	.023
Overall Row Spacing	E2	.620	—	.710
Window Diameter	W	.270	.280	.290

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

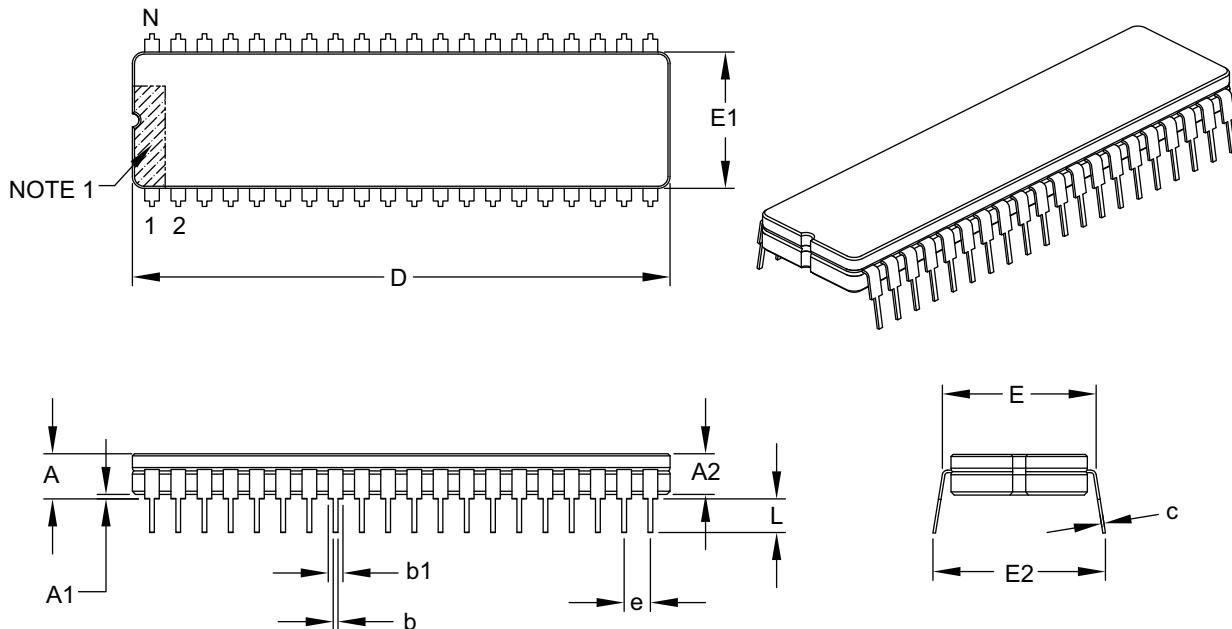
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-013B

Packaging Diagrams and Parameters

40-Lead Ceramic Dual In-Line (JK) – .600" Body [CERDIP]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			40	
Pitch	e			.100 BSC	
Top to Seating Plane	A	—	—	.225	
Ceramic Package Height	A2	.140	—	.175	
Standoff §	A1	.015	—	—	
Shoulder to Shoulder Width	E	.590	—	.625	
Ceramic Package Width	E1	.510	.520	.540	
Overall Length	D	2.030	2.050	2.070	
Tip to Seating Plane	L	.125	—	.200	
Lead Thickness	c	.008	—	.015	
Upper Lead Width	b1	.045	—	.065	
Lower Lead Width	b	.015	—	.023	
Overall Row Spacing	E2	.620	—	.710	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

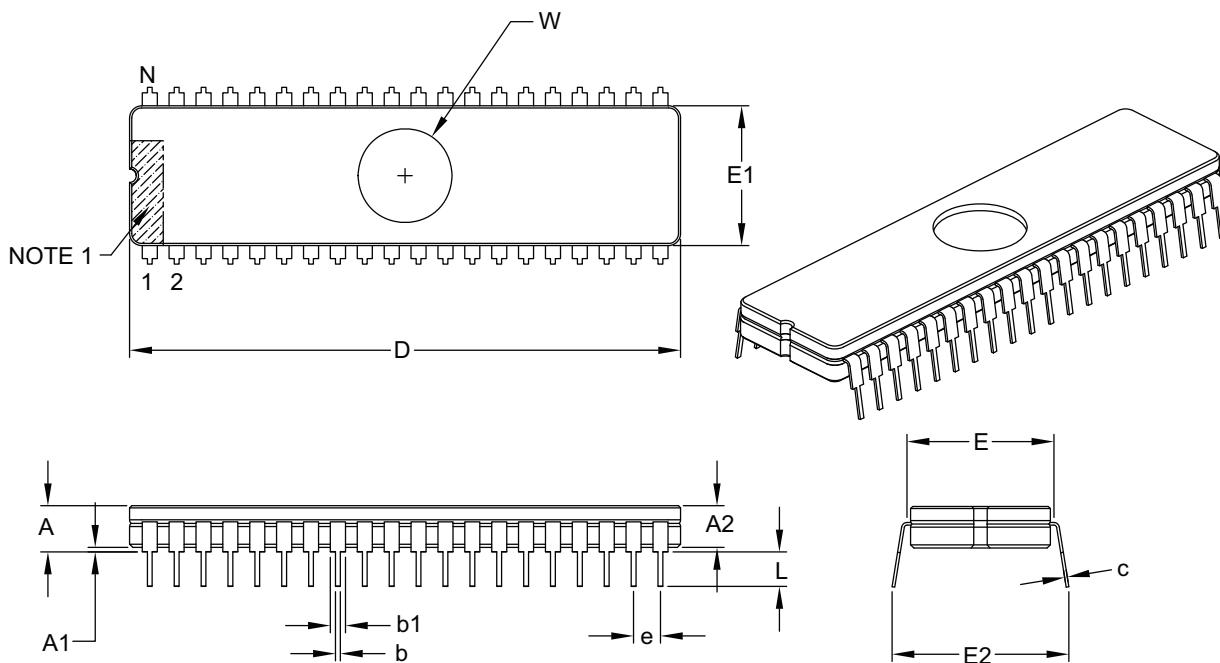
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-008B

Packaging Diagrams and Parameters

40-Lead Ceramic Dual In-Line with Window (JW) – .600" Body [CERDIP]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			40	
Pitch	e			.100 BSC	
Top to Seating Plane	A	—	—	.225	
Ceramic Package Height	A2	.140	—	.175	
Standoff §	A1	.015	—	—	
Shoulder to Shoulder Width	E	.590	—	.625	
Ceramic Package Width	E1	.510	.520	.583	
Overall Length	D	2.030	2.050	2.070	
Tip to Seating Plane	L	.125	—	.200	
Lead Thickness	c	.008	—	.015	
Upper Lead Width	b1	.045	—	.065	
Lower Lead Width	b	.015	—	.023	
Overall Row Spacing	E2	.620	—	.710	
Window Diameter	W	.340	.350	.360	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensioning and tolerancing per ASME Y14.5M.

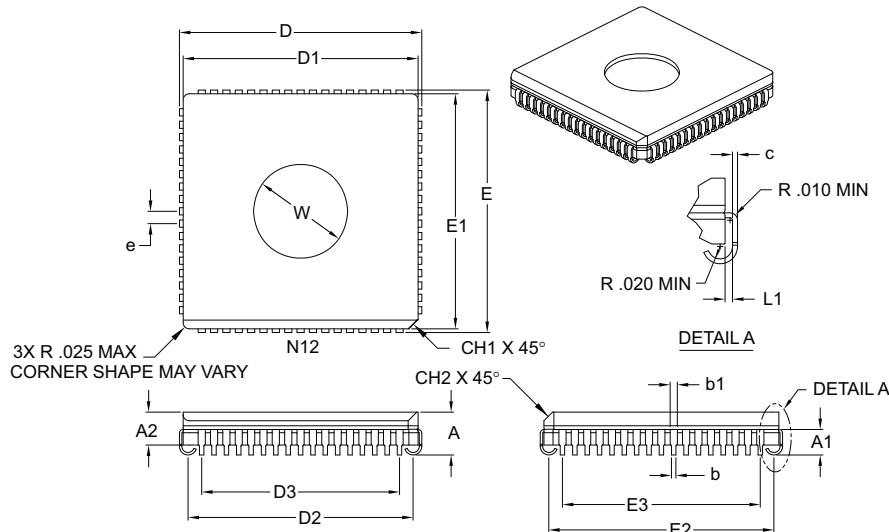
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-014C

Packaging Diagrams and Parameters

68-Lead Ceramic Leaded (CL) Chip Carrier with Window – Square [CERQUAD]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		68	
Pitch	e		.050 BSC	
Overall Height	A	.155	.172	.190
Package Thickness	A2		.132 REF	
Lead Height	A1	0.90	.100	.120
Side Chamfer	CH2		.035 REF	
Corner Chamfer	CH1		.040 REF	
Overall Package Width	E	.985	.990	.995
Overall Package Length	D	.985	.990	.995
Ceramic Package Width	E1	.930	.950	.965
Ceramic Package Length	D1	.930	.950	.965
Overall Lead Centers	E3		.800 REF	
Overall Lead Centers	D3		.800 REF	
Footprint Width	E2	.880	.910	.940
Footprint Length	D2	.880	.910	.940
Lead Length	L1	.006	—	—
Lead Thickness	c	.006	.007	.010
Upper Lead Width	b1	.026	.029	.032
Lower Lead Width	b	.017	.019	.021
Window Diameter	W	.370	.380	.390

Notes:

- Dimensions D1 and E1 do not include glass protrusion. These protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

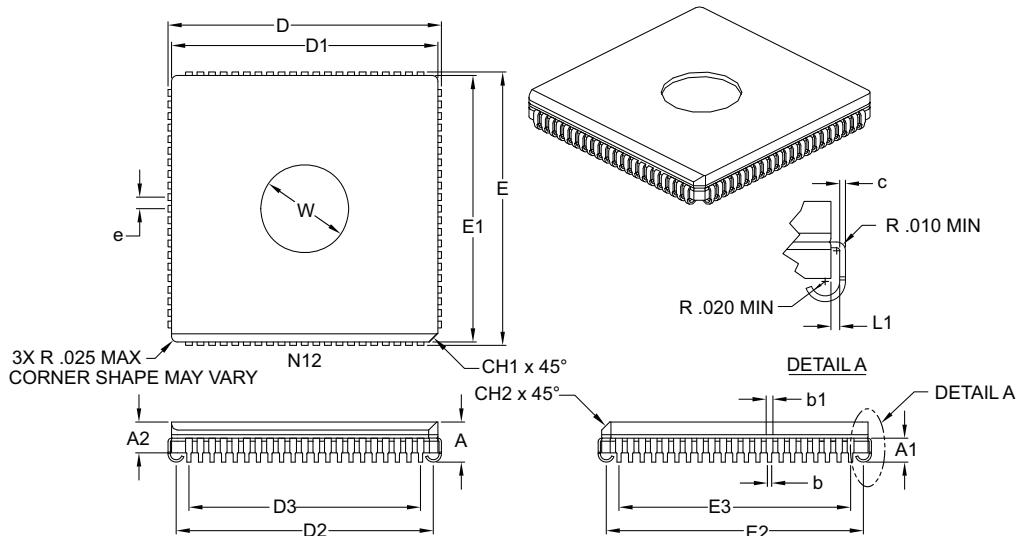
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-097B

Packaging Diagrams and Parameters

84-Lead Ceramic Leaded (CL) Chip Carrier with Window – Square [CERQUAD]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		84	
Pitch	e		.050 BSC	
Overall Height	A	.155	.172	.190
Package Thickness	A2		.132 REF	
Lead Height	A1	0.90	.100	.120
Side Chamfer	CH2		.035 REF	
Corner Chamfer	CH1		.040 REF	
Overall Package Width	E	1.185	1.190	1.195
Overall Package Length	D	1.185	1.190	1.195
Ceramic Package Width	E1	1.130	1.150	1.165
Ceramic Package Length	D1	1.130	1.150	1.165
Overall Lead Centers	E3		1.00 REF	
Overall Lead Centers	D3		1.00 REF	
Footprint Width	E2	1.080	1.110	1.140
Footprint Length	D2	1.080	1.110	1.140
Lead Length	L1	.006	–	–
Lead Thickness	c	.006	.007	.010
Lower Lead Width	b	.017	.019	.021
Upper Lead Width	b1	.026	.029	.032
Window Diameter	W	.395	.400	.405

Notes:

- Dimensions D1 and E1 do not include glass protrusion. These protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

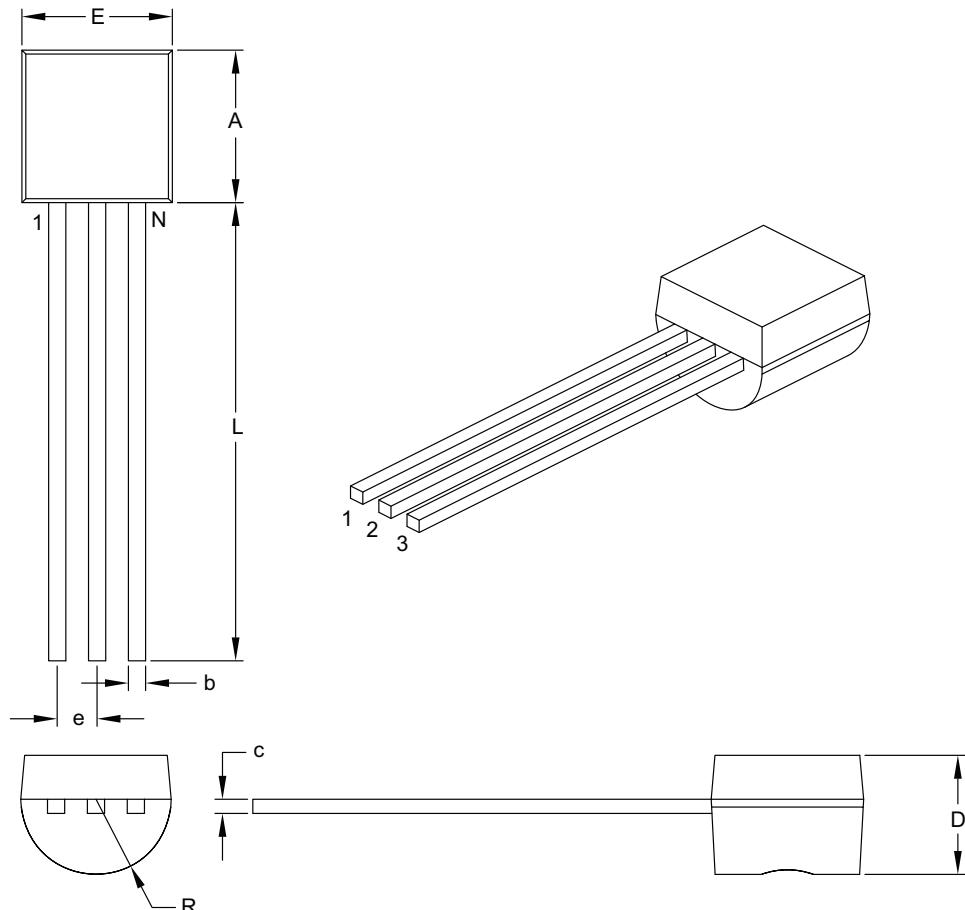
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-112B

Packaging Diagrams and Parameters

3-Lead Plastic Transistor Outline (TO) [TO-92]

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



		INCHES	
Dimension Limits		MIN	MAX
Number of Pins	N	3	
Pitch	e	.050 BSC	
Bottom to Package Flat	D	.125	.165
Overall Width	E	.175	.205
Overall Length	A	.170	.210
Molded Package Radius	R	.080	.105
Tip to Seating Plane	L	.500	-
Lead Thickness	c	.014	.021
Lead Width	b	.014	.022

Notes:

- Dimensions A and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

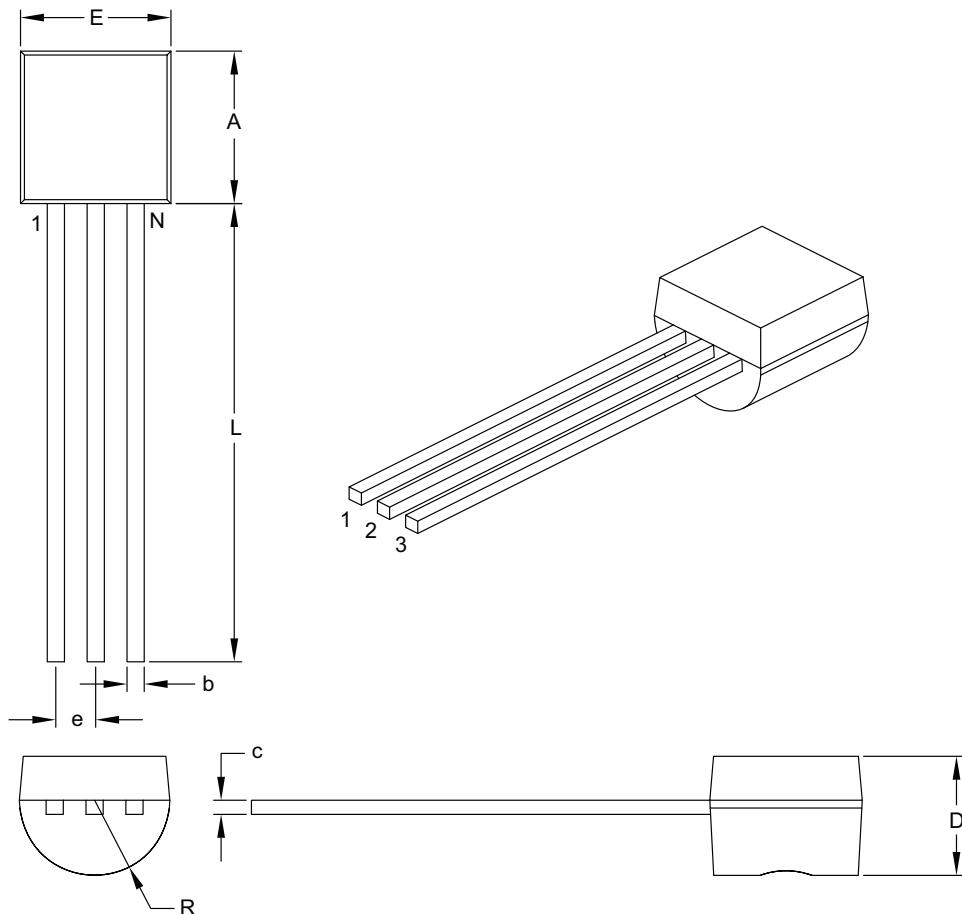
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-101B

Packaging Diagrams and Parameters

3-Lead Plastic Transistor Outline (ZB) [TO-92]

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



		INCHES	
Dimension Limits		MIN	MAX
Number of Pins	N	3	
Pitch	e	.050 BSC	
Bottom to Package Flat	D	.125	.165
Overall Width	E	.175	.205
Overall Length	A	.170	.210
Molded Package Radius	R	.080	.105
Tip to Seating Plane	L	.500	—
Lead Thickness	c	.014	.021
Lead Width	b	.014	.022

Notes:

- Dimensions A and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

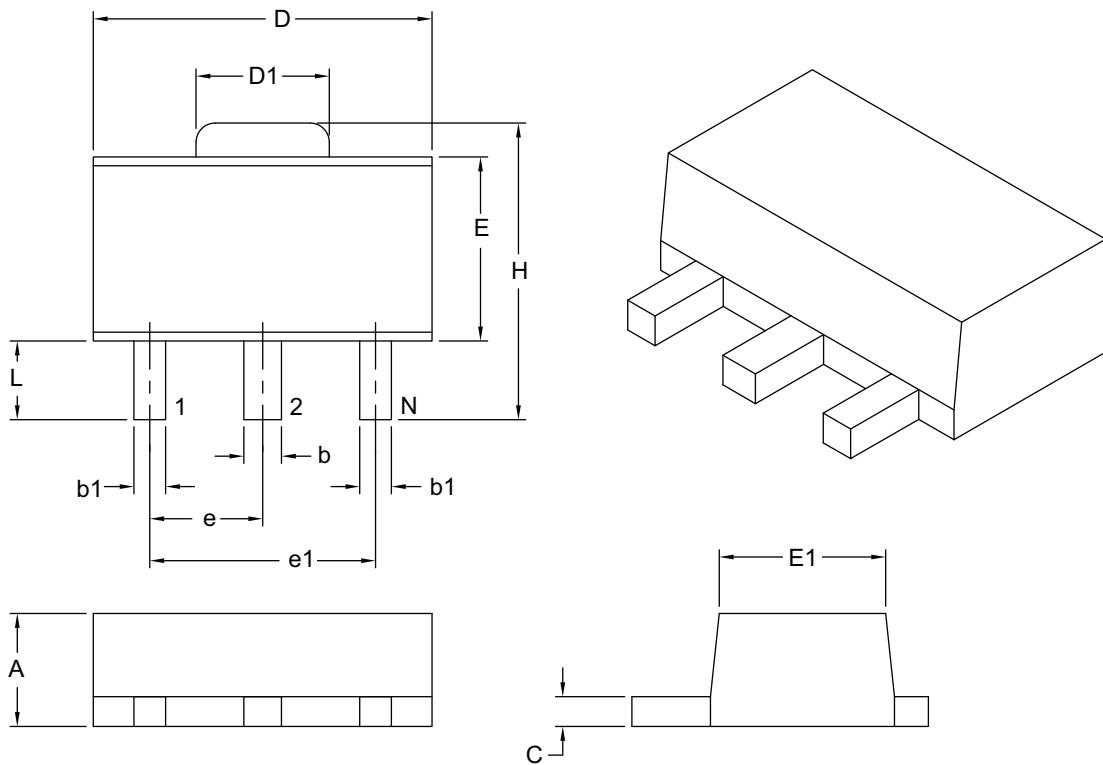
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-101B

Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor Header (MB) [SOT-89]

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	MAX
Number of Leads	N		3	
Pitch	e		1.50 BSC	
Outside Lead Pitch	e1		3.00 BSC	
Overall Height	A	1.40	1.60	
Overall Width	H	3.94	4.25	
Molded Package Width at Base	E	2.29	2.60	
Molded Package Width at Top	E1	2.13	2.29	
Overall Length	D	4.39	4.60	
Tab Length	D1	1.40	1.83	
Foot Length	L	0.79	1.20	
Lead Thickness	c	0.35	0.44	
Lead 2 Width	b	0.41	0.56	
Leads 1 & 3 Width	b1	0.36	0.48	

Notes:

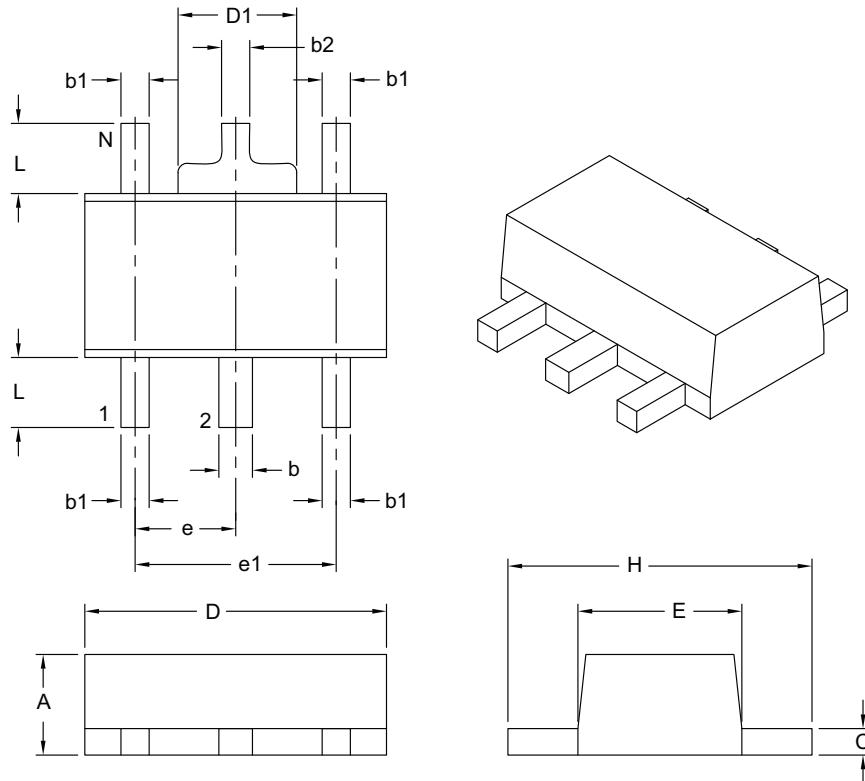
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

5-Lead Plastic Small Outline Transistor Header (MT) [SOT-89]

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



	Units	MILLIMETERS	
		MIN	MAX
Number of Leads	N	5	
Lead Pitch	e	1.50 BSC	
Outside Lead Pitch	e1	3.00 BSC	
Overall Height	A	1.40	1.60
Overall Width	H	3.94	4.50
Molded Package Width	E	2.29	2.60
Overall Length	D	4.40	4.60
Tab Width	D1	1.40	1.83
Foot Length	L	0.80	1.20
Lead Thickness	c	0.35	0.44
Lead 2 Width	b	0.41	0.56
Leads 1, 3, 4 & 5 Width	b1	0.36	0.48
Tab Lead Width	b2	0.32	0.48

Notes:

- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

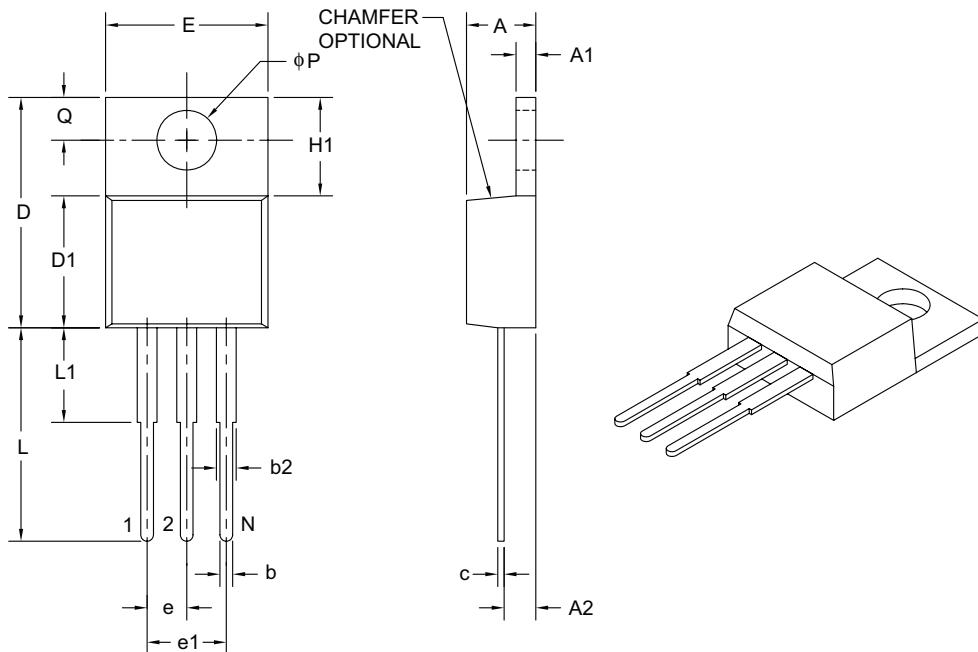
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-030B

Packaging Diagrams and Parameters

3-Lead Plastic Transistor Outline (AB) [TO-220]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		3	
Pitch	e		.100 BSC	
Overall Pin Pitch	e1		.200 BSC	
Overall Height	A	.140	—	.190
Tab Thickness	A1	.020	—	.055
Base to Lead	A2	.080	—	.115
Overall Width	E	.357	—	.420
Mounting Hole Center	Q	.100	—	.120
Overall Length	D	.560	—	.650
Molded Package Length	D1	.330	—	.355
Tab Length	H1	.230	—	.270
Mounting Hole Diameter	φP	.139	—	.156
Lead Length	L	.500	—	.580
Lead Shoulder	L1	—	—	.250
Lead Thickness	c	.012	—	.024
Lead Width	b	.015	.027	.040
Shoulder Width	b2	.045	.057	.070

Notes:

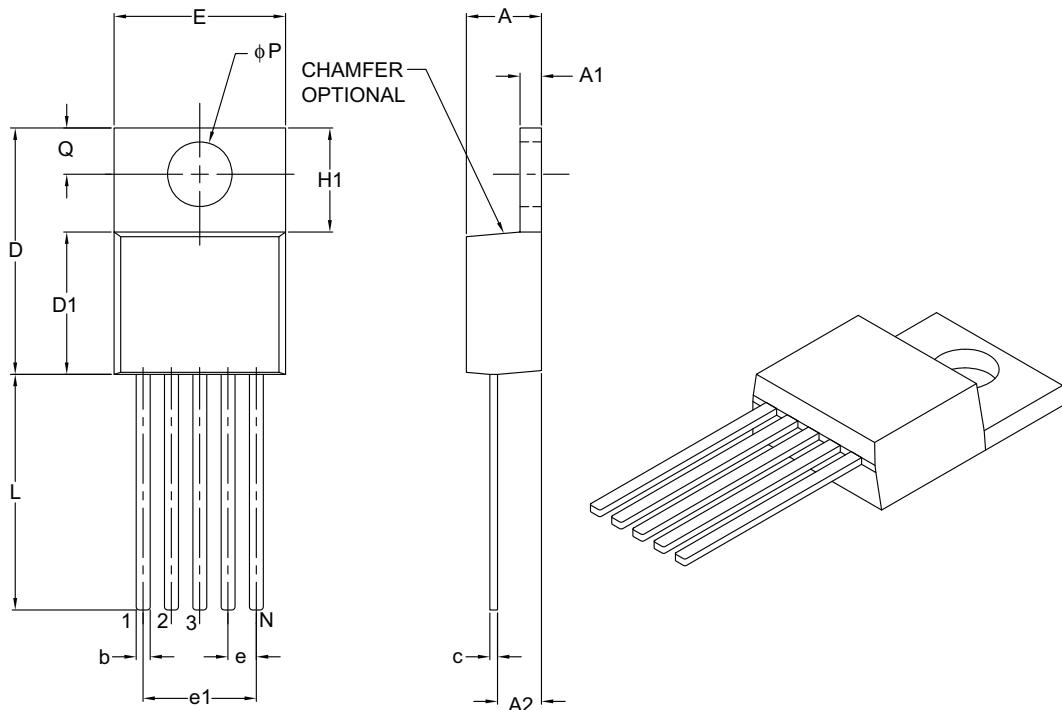
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

5-Lead Plastic Transistor Outline (AT) [TO-220]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		5	
Pitch	e		.067 BSC	
Overall Pin Pitch	e1		.268 BSC	
Overall Height	A	.140	—	.190
Overall Width	E	.380	—	.420
Overall Length	D	.560	—	.650
Molded Package Length	D1	.330	—	.355
Tab Length	H1	.204	—	.293
Tab Thickness	A1	.020	—	.055
Mounting Hole Center	Q	.100	—	.120
Mounting Hole Diameter	φP	.139	—	.156
Lead Length	L	.482	—	.590
Base to Bottom of Lead	A2	.080	—	.115
Lead Thickness	c	.012	—	.025
Lead Width	b	.015	.027	.040

Notes:

- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

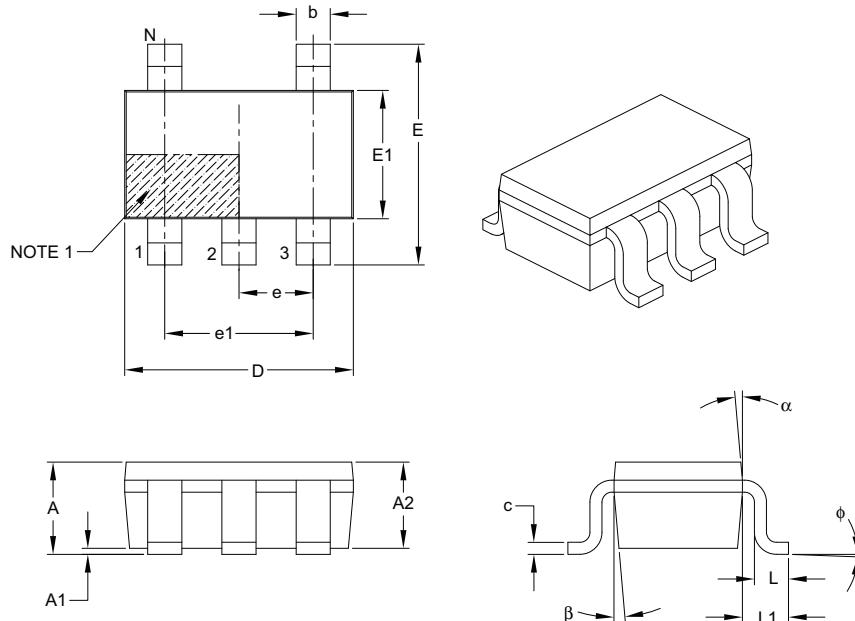
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-036B

Packaging Diagrams and Parameters

5-Lead Plastic Thin Small Outline Transistor (OS) [TSOT]

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 Leads	N		5	
Lead Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	—	—	1.10
Molded Package Thickness	A2	0.70	0.90	1.00
Standoff	A1	0.00	—	0.10
Overall Width	E	2.80 BSC		
Molded Package Width	E1	1.60 BSC		
Overall Length	D	2.90 BSC		
Foot Length	L	0.30	0.45	0.60
Footprint	L1	0.60 REF		
Foot Angle	phi	0°	4°	8°
Lead Thickness	c	0.08	—	0.20
Lead Width	b	0.30	—	0.50
Mold Draft Angle Top	alpha	4°	10°	12°
Mold Draft Angle Bottom	beta	4°	10°	12°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

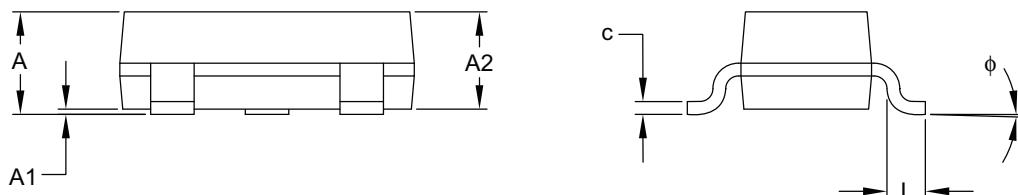
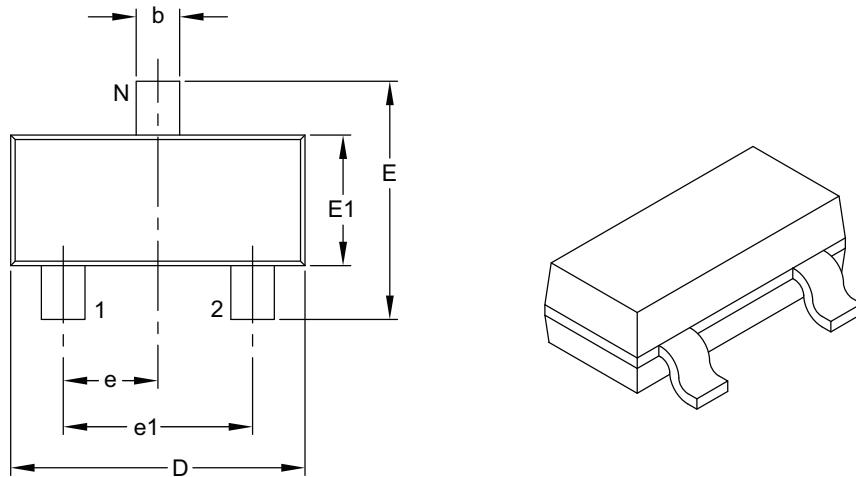
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor (TT) [SOT-23]

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 Pins	N		3		
Lead Pitch	e		0.95	BSC	
Outside Lead Pitch	e1		1.90	BSC	
Overall Height	A	0.89	—	1.12	
Molded Package Thickness	A2	0.79	0.95	1.02	
Standoff	A1	0.01	—	0.10	
Overall Width	E	2.10	—	2.64	
Molded Package Width	E1	1.16	1.30	1.40	
Overall Length	D	2.67	2.90	3.05	
Foot Length	L	0.13	0.50	0.60	
Foot Angle	phi	0°	—	10°	
Lead Thickness	c	0.08	—	0.20	
Lead Width	b	0.30	—	0.54	

Notes:

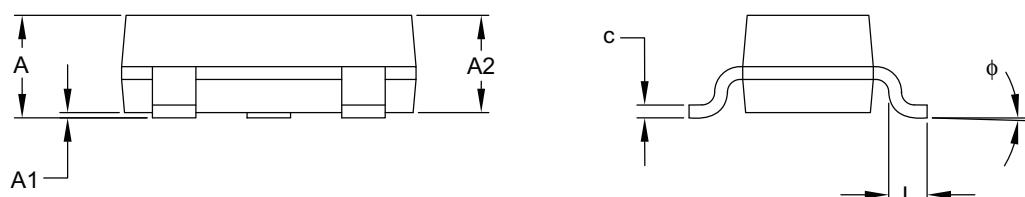
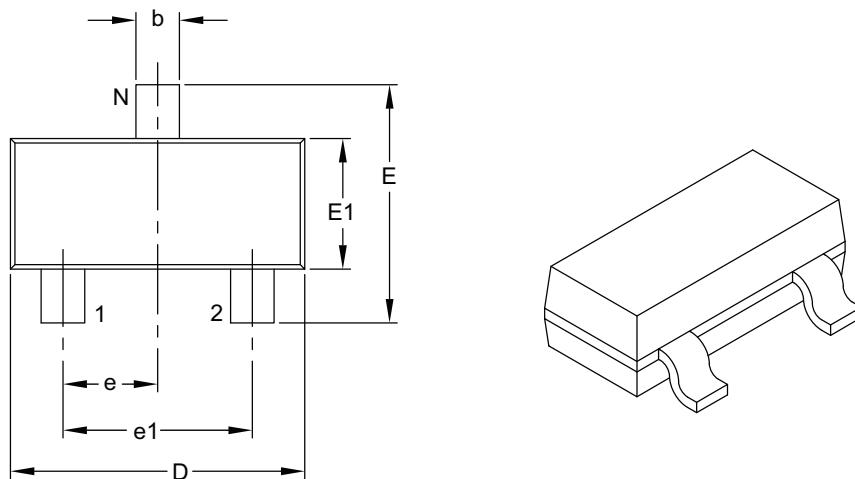
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor (NB) [SOT-23]

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 Pins	N		3	
Lead Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	0.89	—	1.12
Molded Package Thickness	A2	0.79	0.95	1.02
Standoff	A1	0.01	—	0.10
Overall Width	E	2.10	—	2.64
Molded Package Width	E1	1.16	1.30	1.40
Overall Length	D	2.67	2.90	3.05
Foot Length	L	0.13	0.50	0.60
Foot Angle	phi	0°	—	10°
Lead Thickness	c	0.08	—	0.20
Lead Width	b	0.30	—	0.54

Notes:

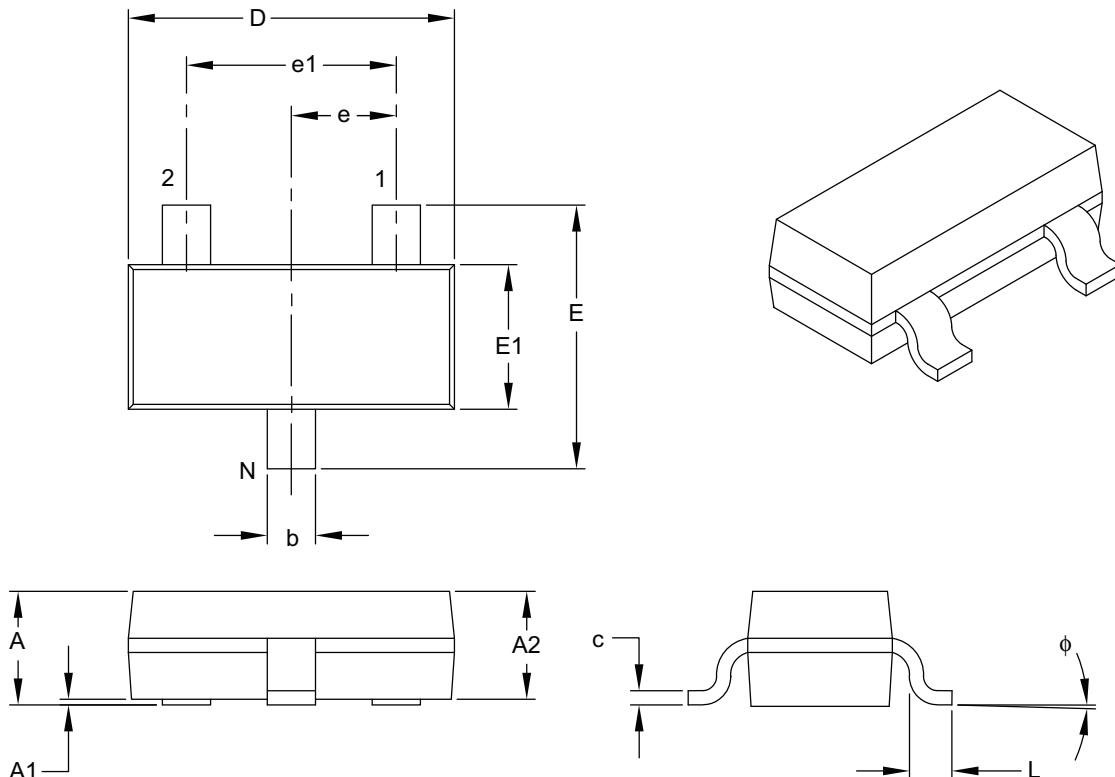
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor (CB) [SOT-23A]

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



Dimension Limits	MILLIMETERS		
	MIN	NOM	MAX
Number of Pins	N	3	
Lead Pitch	e	0.95 BSC	
Outside Lead Pitch	e1	1.90 BSC	
Overall Height	A	0.89	1.45
Molded Package Thickness	A2	0.90	1.30
Standoff	A1	0.00	0.15
Overall Width	E	2.10	3.00
Molded Package Width	E1	1.20	1.80
Overall Length	D	2.70	3.10
Foot Length	L	0.15	0.60
Foot Angle	phi	0°	30°
Lead Thickness	c	0.09	0.26
Lead Width	b	0.30	0.51

Notes:

- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Microchip Technology Drawing C04-130B

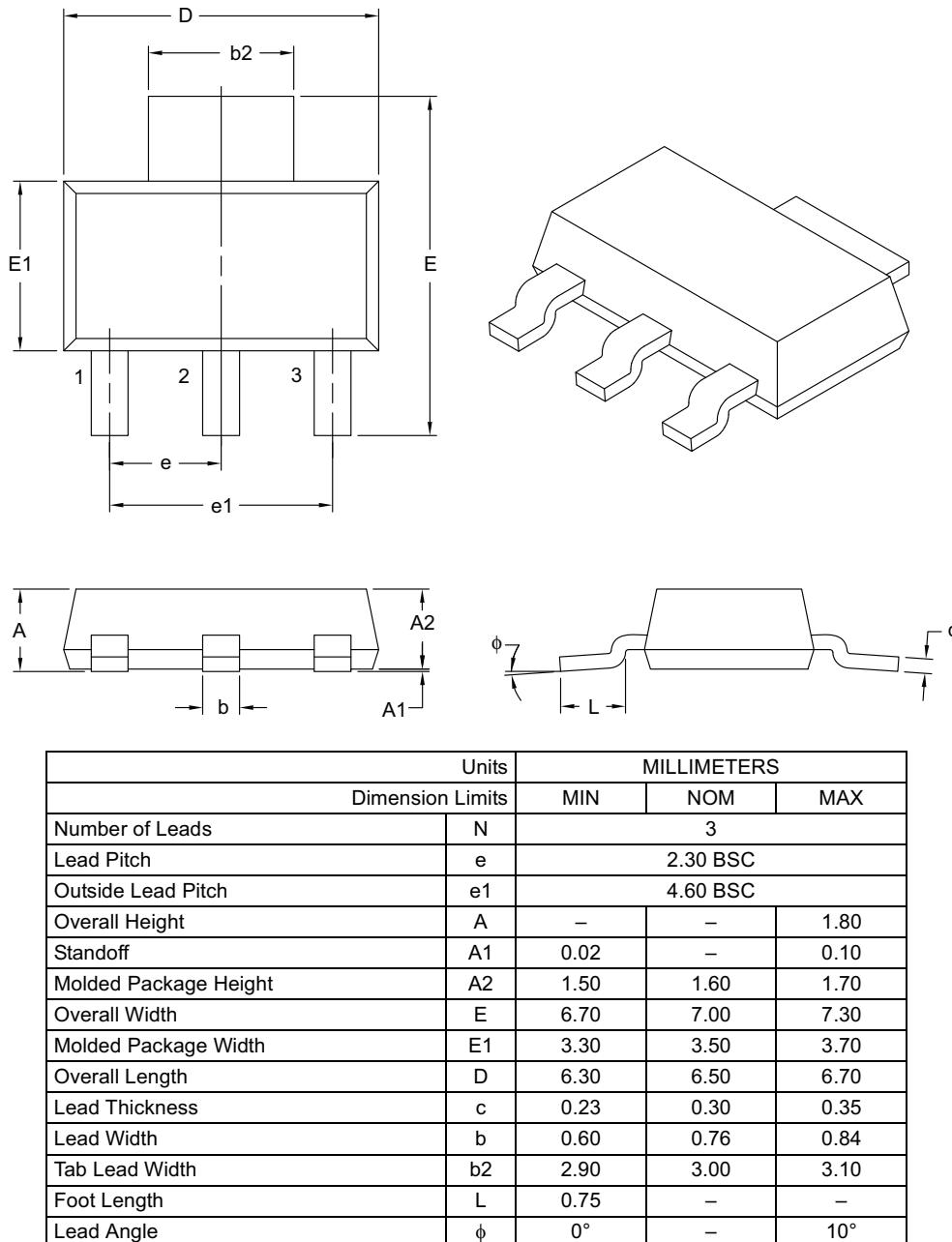
Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor (DB) [SOT-223]

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



Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

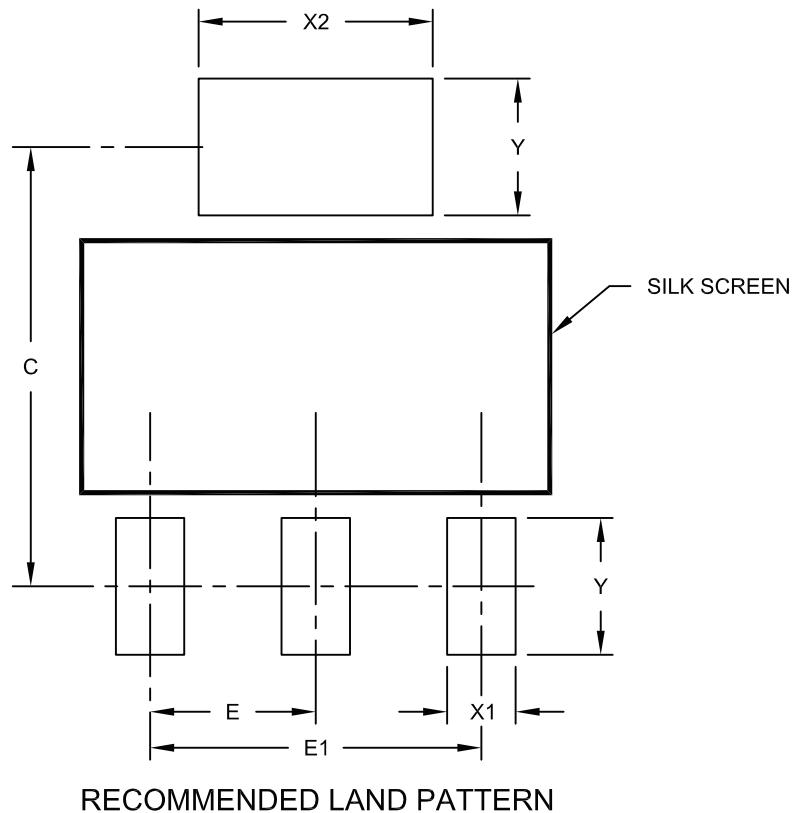
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-032B

Land Pattern (Footprint)

3-Lead Plastic Small Outline Transistor (DB) [SOT-223]

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



RECOMMENDED LAND PATTERN

Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Contact Pitch	E		2.30	BSC
Overall Pitch	E1		4.60	BSC
Contact Pad Spacing	C		6.10	
Contact Pad Width	X1			0.95
Contact Pad Width	X2			3.25
Contact Pad Length	Y			1.90

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

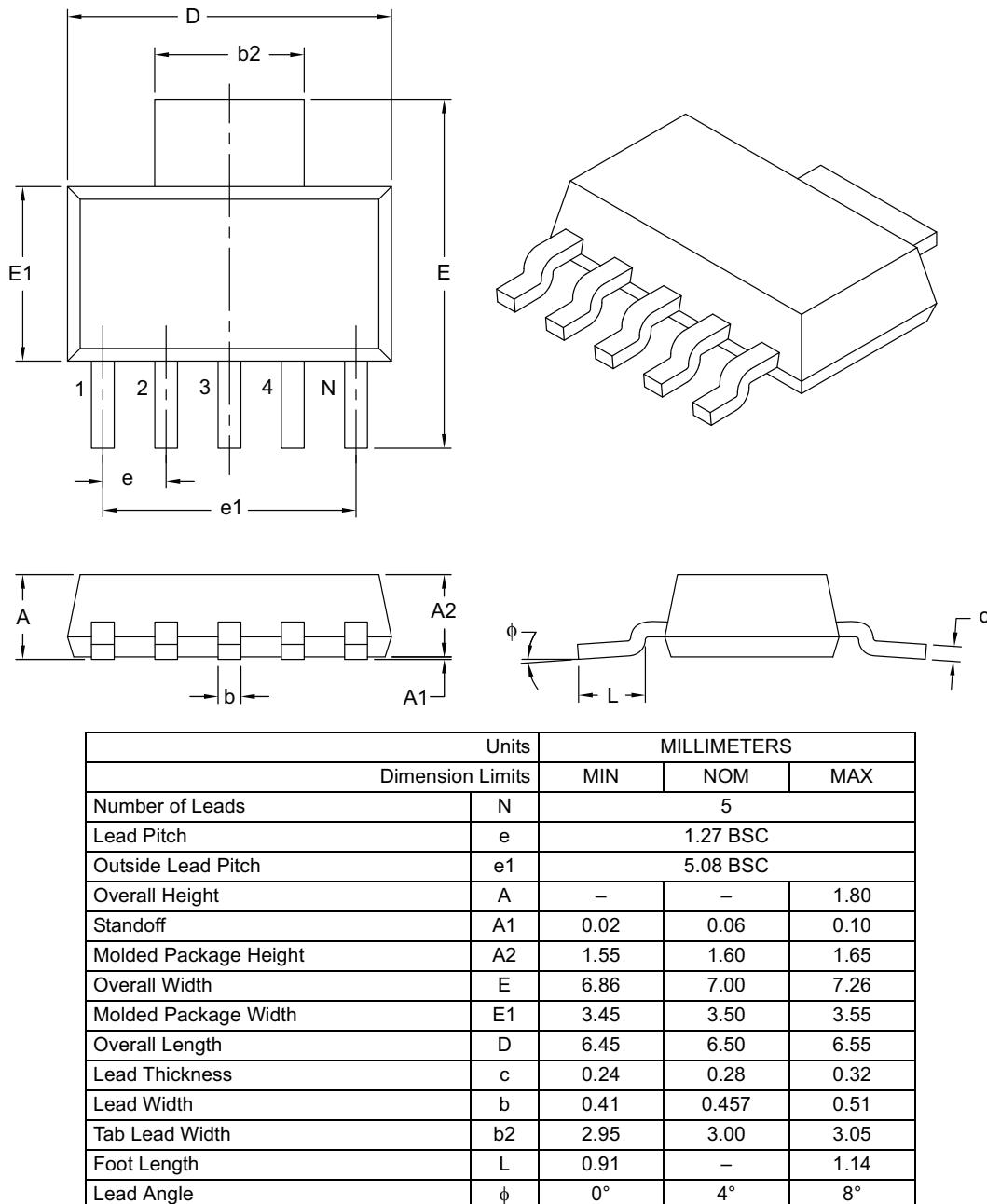
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2032A

Packaging Diagrams and Parameters

5-Lead Plastic Small Outline Transistor (DC) [SOT-223]

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



Notes:

- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

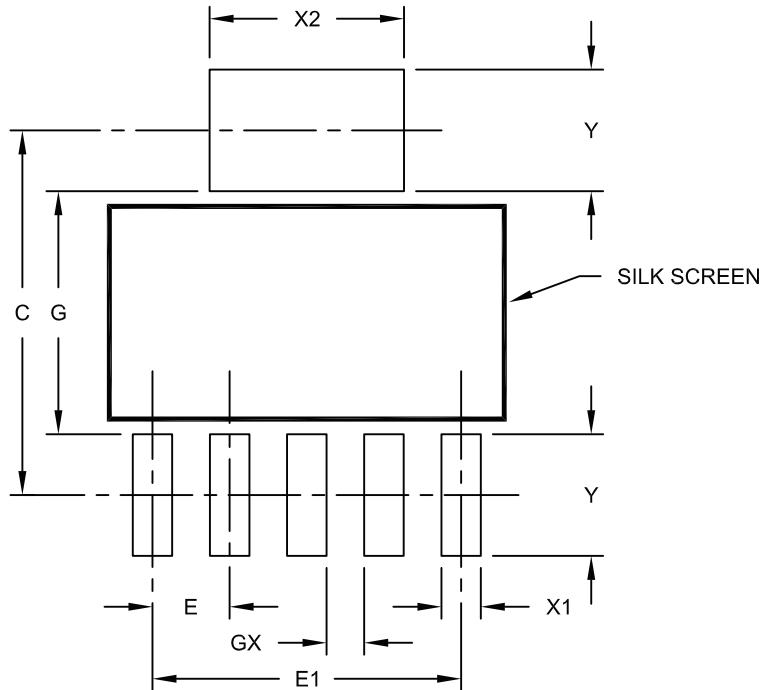
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-137B

Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor (DC) [SOT-223]

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



RECOMMENDED LAND PATTERN

Dimension	Units	MILLIMETERS		
		MIN	NOM	MAX
Pad Pitch	E	1.27	BSC	
Overall Pad Pitch	E1	5.08	BSC	
Pad Spacing	C		6.00	
Pad Width	X1			0.65
Pad Width	X2			3.20
Pad Length	Y			2.00
Distance Between Pads	G	4.00		
Distance Between Pads	GX	0.62		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

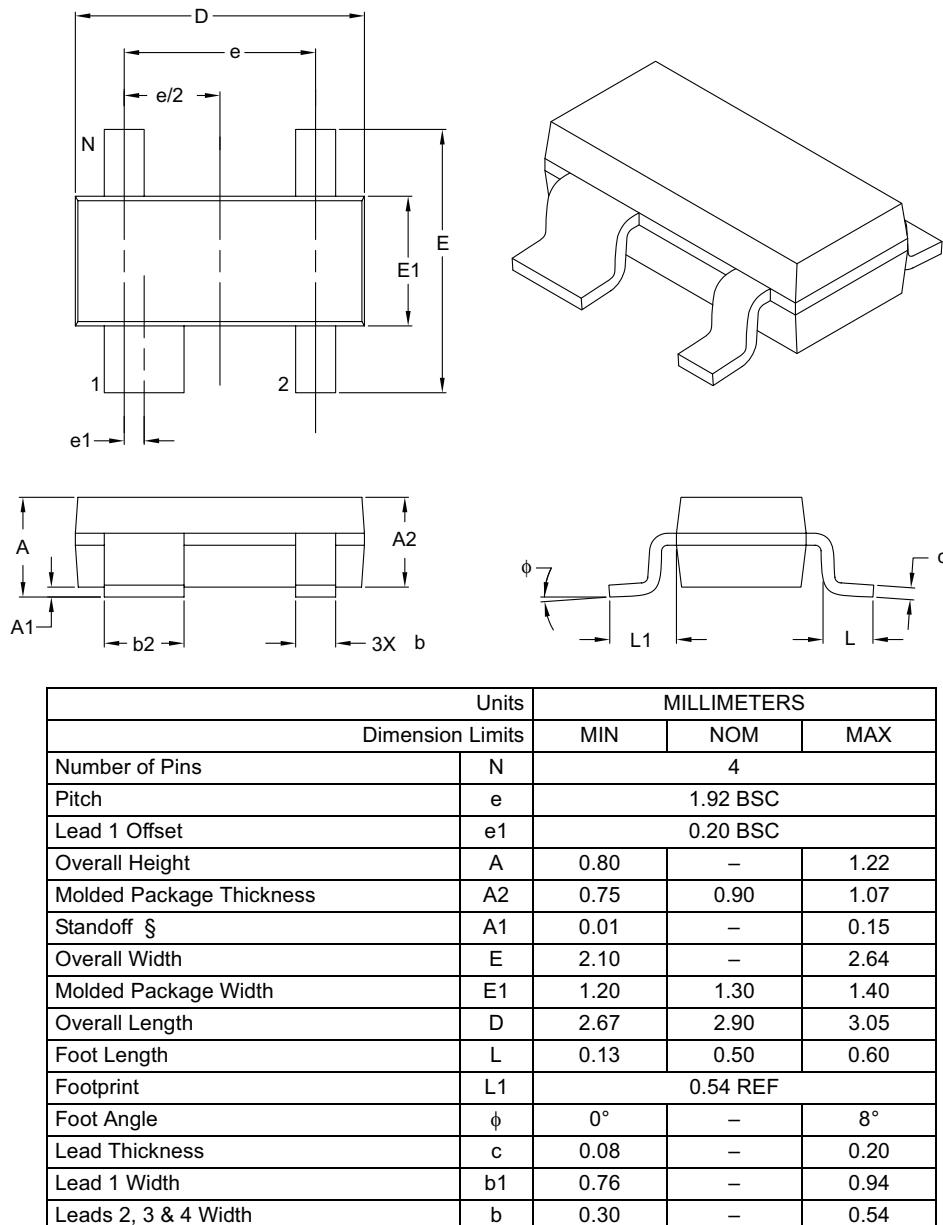
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2137A

Packaging Diagrams and Parameters

4-Lead Plastic Small Outline Transistor (RC) [SOT-143]

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



Notes:

1. § Significant Characteristic.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

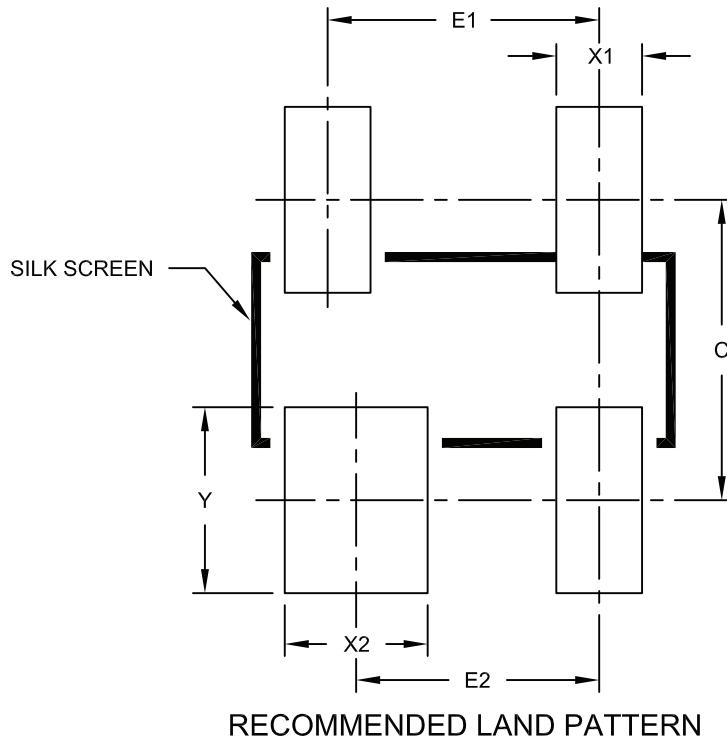
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

4-Lead Plastic Small Outline Transistor (RC) [SOT-143]

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



Dimension Limits	Units	MILLIMETERS		
		MIN	NOM	MAX
Contact Pitch	E1		1.90	BSC
Contact Pitch	E2		1.60	BSC
Contact Width	X1			0.60
Contact Width	X2			1.00
Contact Length	Y			1.30
Contact Pad Spacing	C	2.10		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

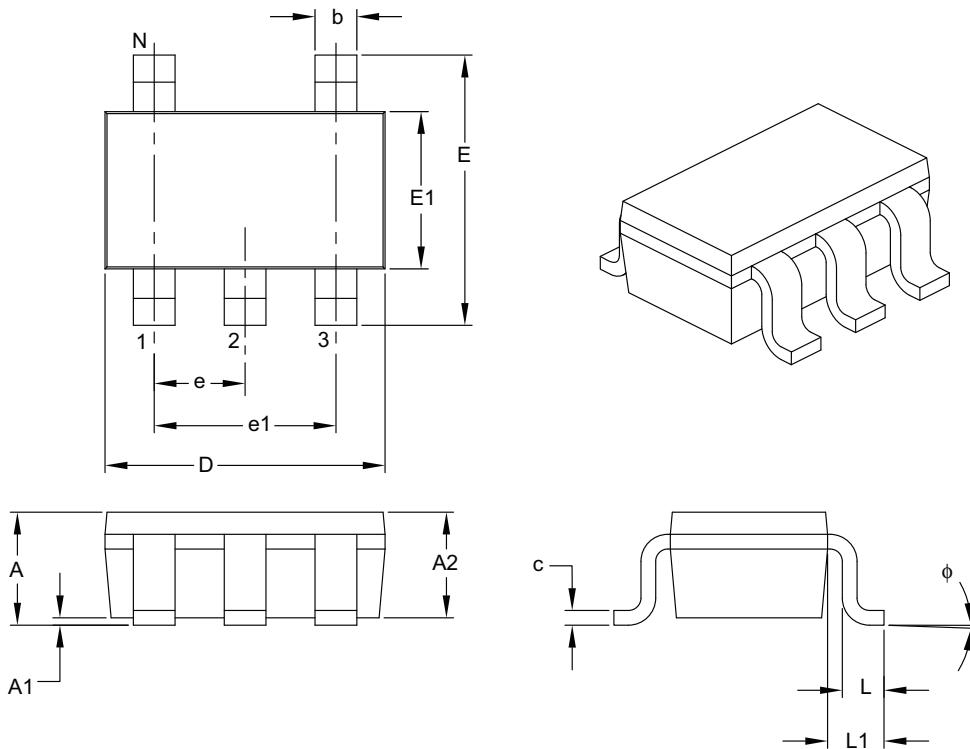
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2031A

Packaging Diagrams and Parameters

5-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>



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		5	
Lead Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	0.90	—	1.45
Molded Package Thickness	A2	0.89	—	1.30
Standoff	A1	0.00	—	0.15
Overall Width	E	2.20	—	3.20
Molded Package Width	E1	1.30	—	1.80
Overall Length	D	2.70	—	3.10
Foot Length	L	0.10	—	0.60
Footprint	L1	0.35	—	0.80
Foot Angle	ϕ	0°	—	30°
Lead Thickness	c	0.08	—	0.26
Lead Width	b	0.20	—	0.51

Notes:

- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

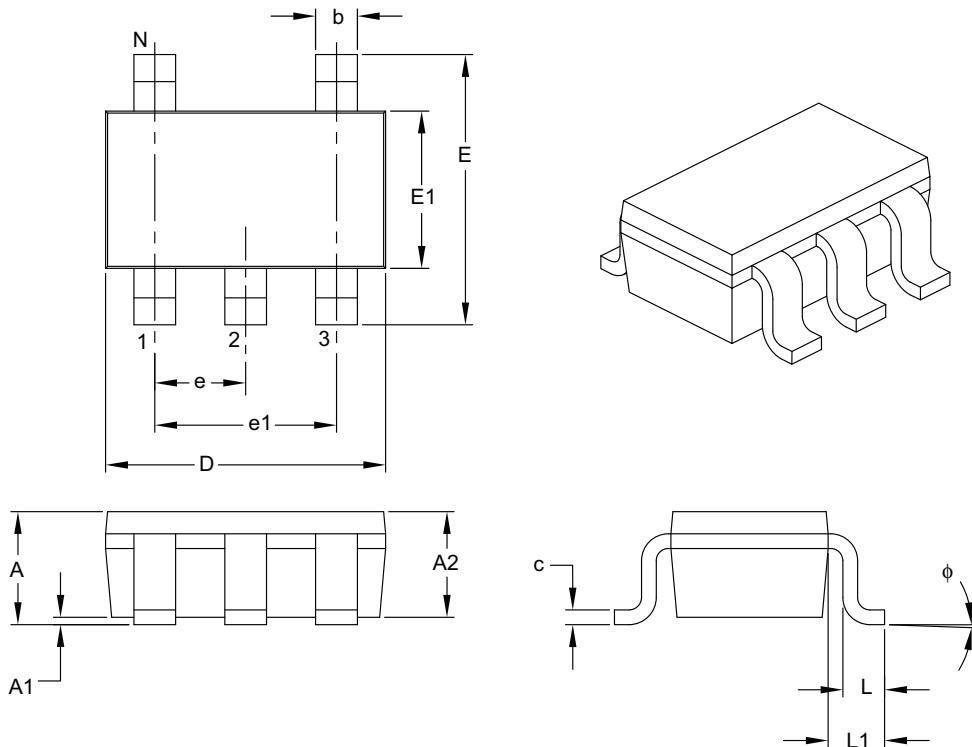
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-091B

Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor (CT) [SOT-23]

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 Pins	N	5		
Lead Pitch	e	0.95	BSC	
Outside Lead Pitch	e1	1.90	BSC	
Overall Height	A	0.90	—	1.45
Molded Package Thickness	A2	0.89	—	1.30
Standoff	A1	0.00	—	0.15
Overall Width	E	2.20	—	3.20
Molded Package Width	E1	1.30	—	1.80
Overall Length	D	2.70	—	3.10
Foot Length	L	0.10	—	0.60
Footprint	L1	0.35	—	0.80
Foot Angle	φ	0°	—	30°
Lead Thickness	c	0.08	—	0.26
Lead Width	b	0.20	—	0.51

Notes:

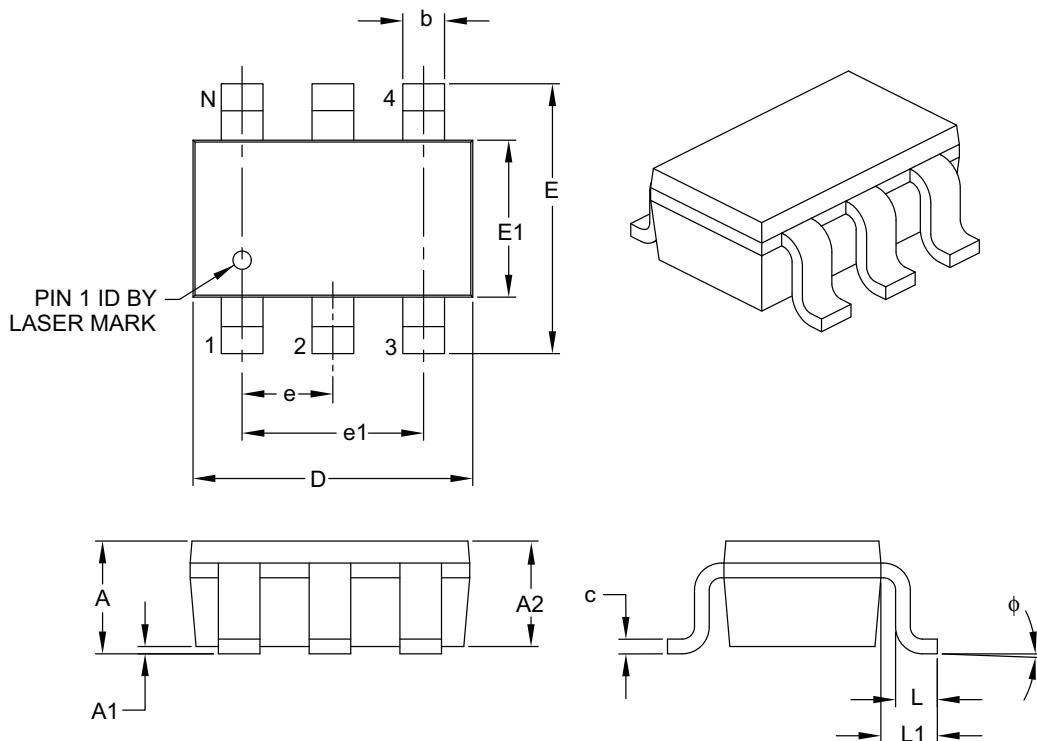
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

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

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 Pins	N				6		
Pitch	e				0.95	BSC	
Outside Lead Pitch	e1				1.90	BSC	
Overall Height	A	0.90		—	—	1.45	
Molded Package Thickness	A2	0.89		—	—	1.30	
Standoff	A1	0.00		—	—	0.15	
Overall Width	E	2.20		—	—	3.20	
Molded Package Width	E1	1.30		—	—	1.80	
Overall Length	D	2.70		—	—	3.10	
Foot Length	L	0.10		—	—	0.60	
Footprint	L1	0.35		—	—	0.80	
Foot Angle	ϕ	0°		—	—	30°	
Lead Thickness	c	0.08		—	—	0.26	
Lead Width	b	0.20		—	—	0.51	

Notes:

- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

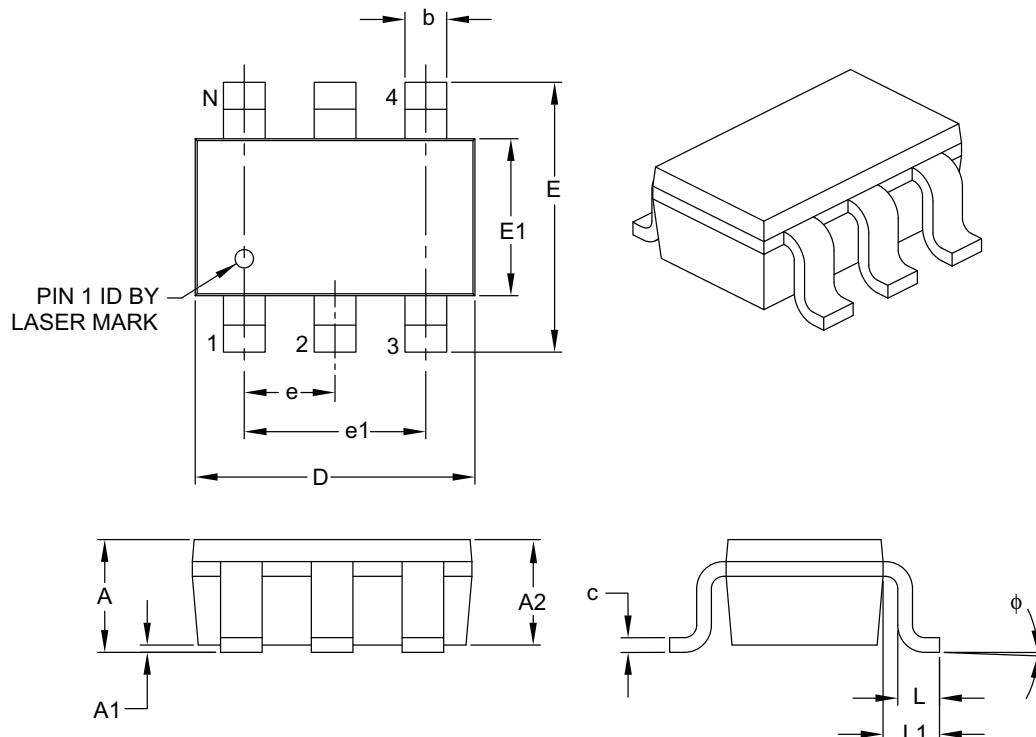
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-028B

Packaging Diagrams and Parameters

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>



Units		MILLIMETERS		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		6	
Pitch	e		0.95 BSC	
Outside Lead Pitch	e1		1.90 BSC	
Overall Height	A	0.90	—	1.45
Molded Package Thickness	A2	0.89	—	1.30
Standoff	A1	0.00	—	0.15
Overall Width	E	2.20	—	3.20
Molded Package Width	E1	1.30	—	1.80
Overall Length	D	2.70	—	3.10
Foot Length	L	0.10	—	0.60
Footprint	L1	0.35	—	0.80
Foot Angle	φ	0°	—	30°
Lead Thickness	c	0.08	—	0.26
Lead Width	b	0.20	—	0.51

Notes:

- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

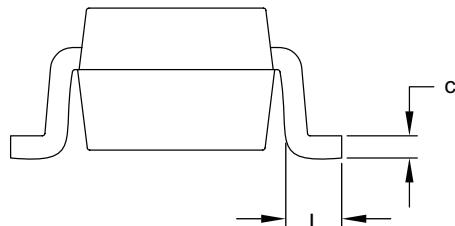
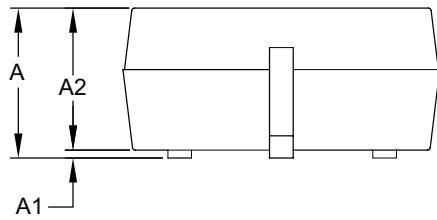
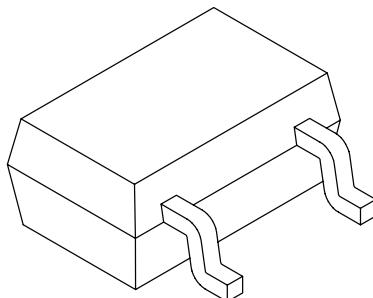
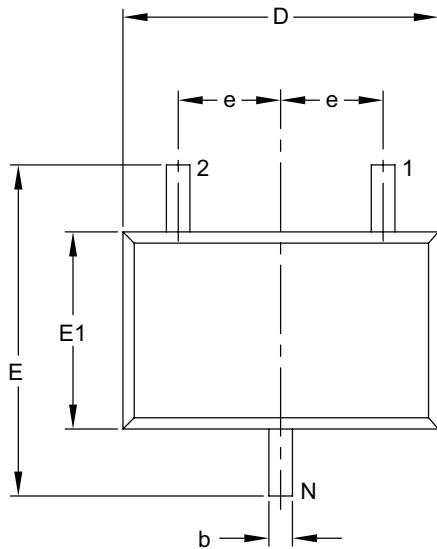
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-028B

Packaging Diagrams and Parameters

3-Lead Plastic Small Outline Transistor (LB) [SC70]

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 Pins	N				3		
Pitch	e				0.65	BSC	
Overall Height	A	0.80		—	—	1.10	
Molded Package Thickness	A2	0.80		—	—	1.00	
Standoff	A1	0.00		—	—	0.10	
Overall Width	E	1.80		2.10	—	2.40	
Molded Package Width	E1	1.15		1.25	—	1.35	
Overall Length	D	1.80		2.00	—	2.25	
Foot Length	L	0.10		0.20	—	0.46	
Lead Thickness	c	0.08		—	—	0.26	
Lead Width	b	0.15		—	—	0.40	

Notes:

1. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
2. Dimensioning and tolerancing per ASME Y14.5M.

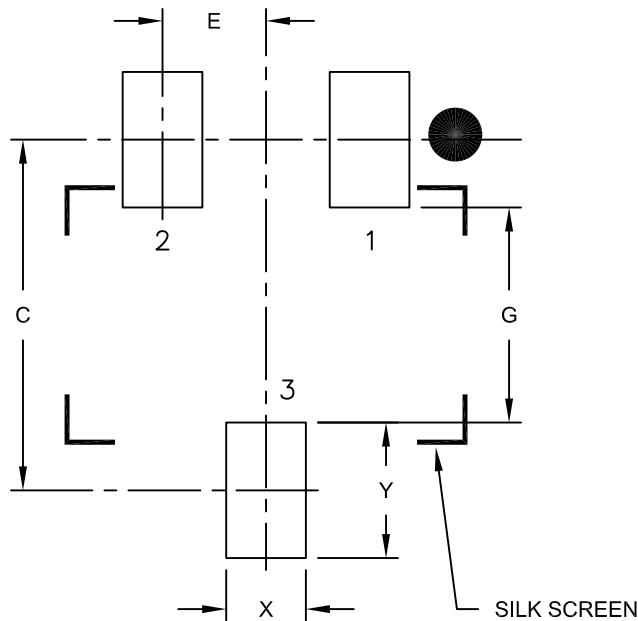
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-060B

Land Pattern (Footprint)

3-Lead Plastic Small Outline Transistor (LB) [SC70] Land Pattern

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		0.65	BSC	
Contact Pad Spacing	C		2.20		
Contact Pad Width	X			0.50	
Contact Pad Length	Y				0.95
Distance Between Pads	G	1.25			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

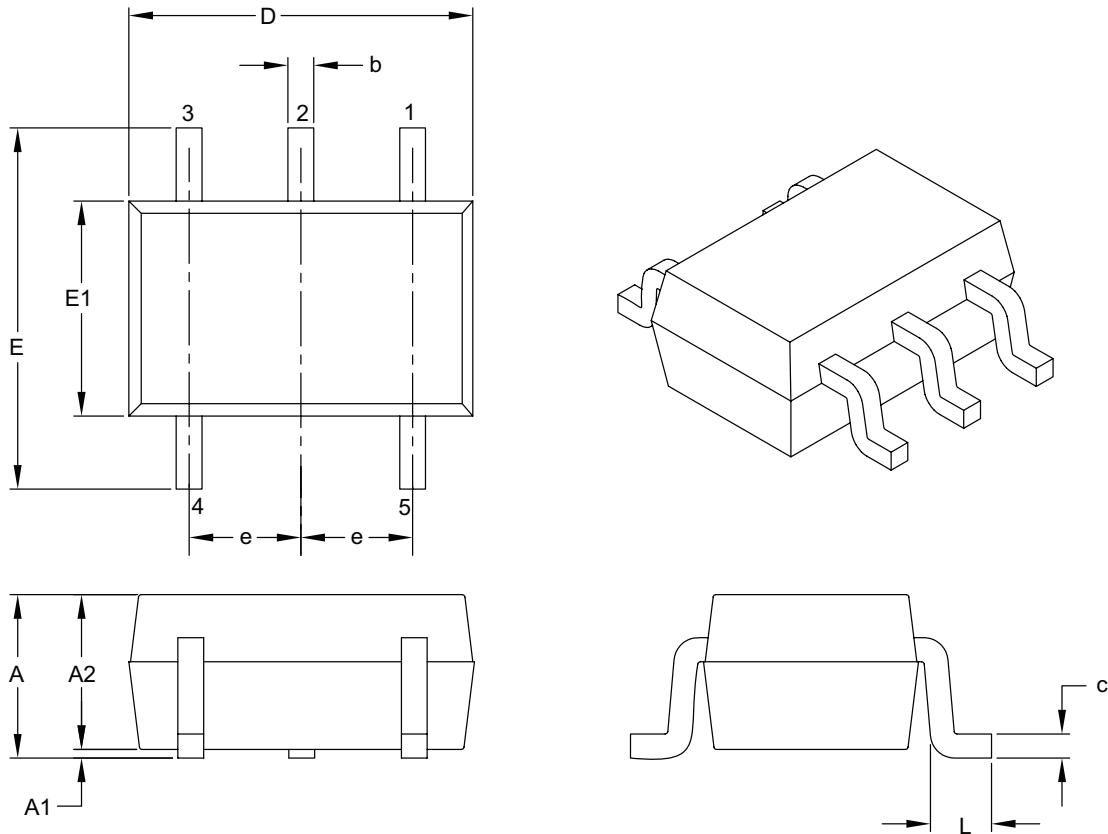
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2060A

Packaging Diagrams and Parameters

5-Lead Plastic Small Outline Transistor (LT) [SC70]

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 Pins	N				5		
Pitch	e				0.65	BSC	
Overall Height	A	0.80		—	1.10		
Molded Package Thickness	A2	0.80		—	1.00		
Standoff	A1	0.00		—	0.10		
Overall Width	E	1.80		2.10	2.40		
Molded Package Width	E1	1.15		1.25	1.35		
Overall Length	D	1.80		2.00	2.25		
Foot Length	L	0.10		0.20	0.46		
Lead Thickness	c	0.08		—	0.26		
Lead Width	b	0.15		—	0.40		

Notes:

- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

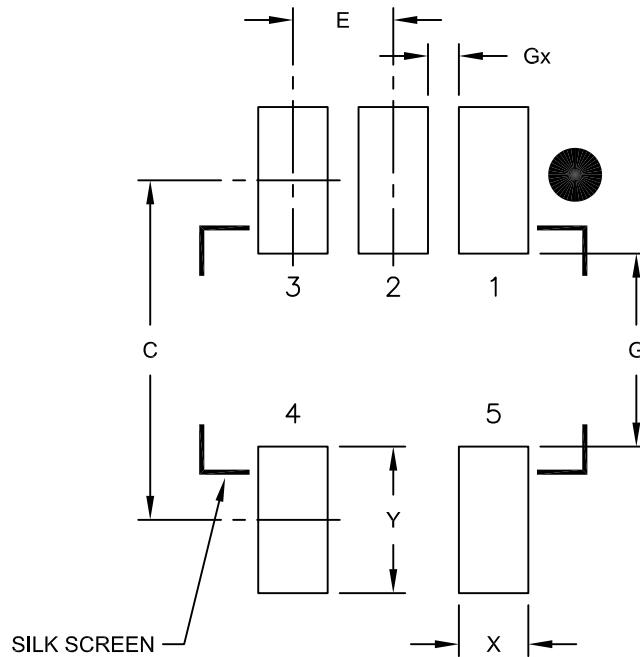
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-061B

Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor (LT) [SC70] Land Pattern

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		0.65	BSC
Contact Pad Spacing	C		2.20	
Contact Pad Width	X			0.45
Contact Pad Length	Y			0.95
Distance Between Pads	G	1.25		
Distance Between Pads	Gx	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

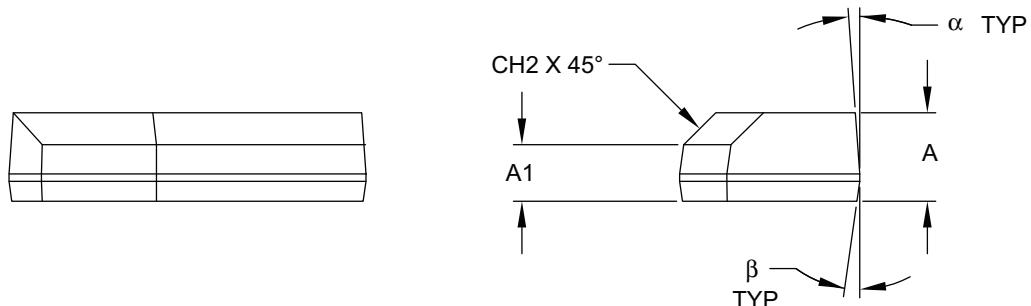
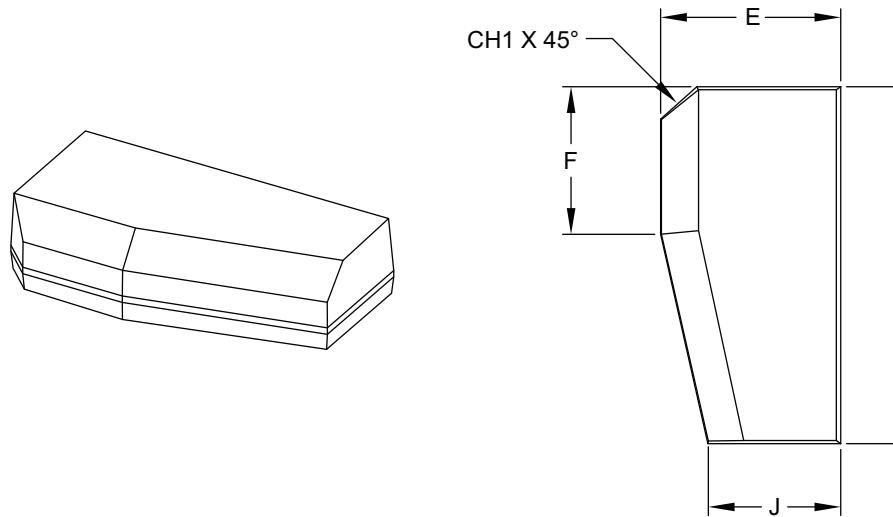
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2061A

Packaging Diagrams and Parameters

Leadless Wedge Module Plastic Small Outline Transistor (WM) [SOT-385]

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
Overall Height	A	2.90	3.00	3.05
Bottom of Package to Chamfer	A1	1.90	2.00	2.10
Overall Width	E	6.00	6.10	6.20
Overall Length	D	12.00	12.10	12.20
Width at Tapered End	J	4.40	4.50	4.60
Length of Flat	F	4.90	5.00	5.10
Chamfer Distance, Horizontal	CH1	1.00	1.10	1.20
Chamfer Distance, Vertical	CH2	1.00	1.10	1.20
Mold Draft Angle Top	α	4°	6°	8°
Mold Draft Angle Bottom	β	4°	6°	8°

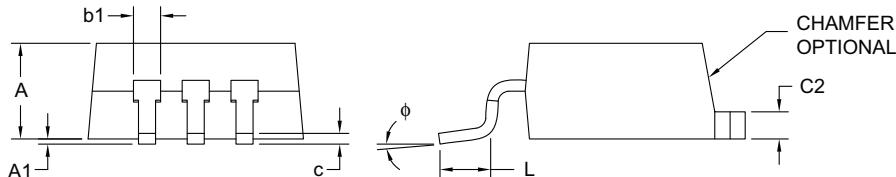
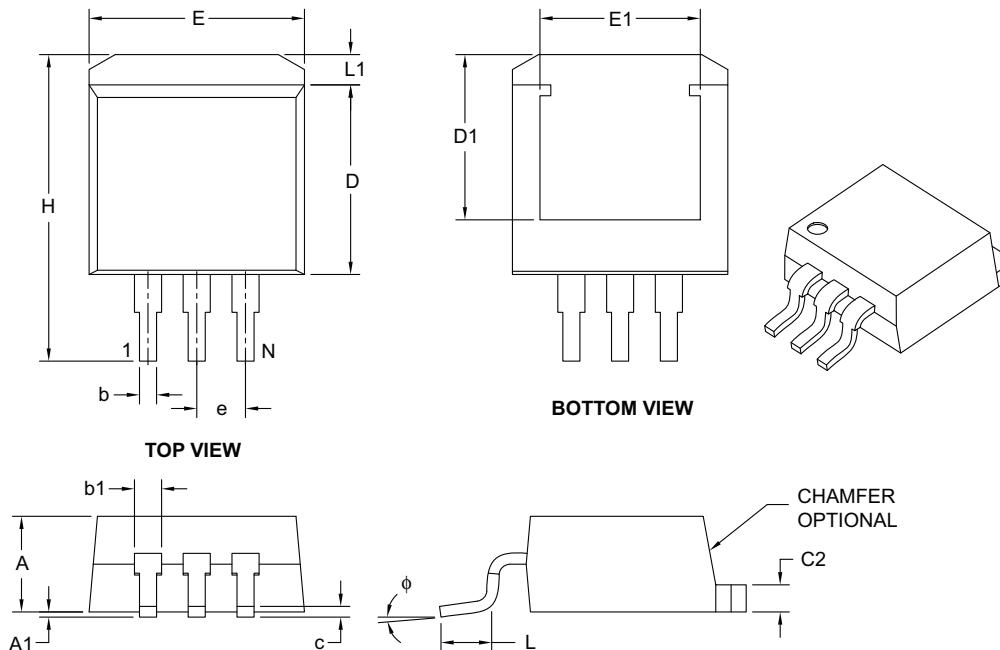
Note:

- Dimensions D, E, F and J do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.

Land Pattern (Footprint)

3-Lead Plastic (EB) [DDPAK]

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



		Units	INCHES		
		Dimension Limits	MIN	NOM	MAX
Number of Pins	N			3	
Pitch	e			.100 BSC	
Overall Height	A	.160	—	.190	
Standoff §	A1	.000	—	.010	
Overall Width	E	.380	—	.420	
Exposed Pad Width	E1	.245	—	—	
Molded Package Length	D	.330	—	.380	
Overall Length	H	.549	—	.625	
Exposed Pad Length	D1	.270	—	—	
Lead Thickness	c	.014	—	.029	
Pad Thickness	C2	.045	—	.065	
Lower Lead Width	b	.020	—	.039	
Upper Lead Width	b1	.045	—	.070	
Foot Length	L	.068	—	.110	
Pad Length	L1	—	—	.067	
Foot Angle	ϕ	0°	—	8°	

Notes:

- § Significant Characteristic.
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

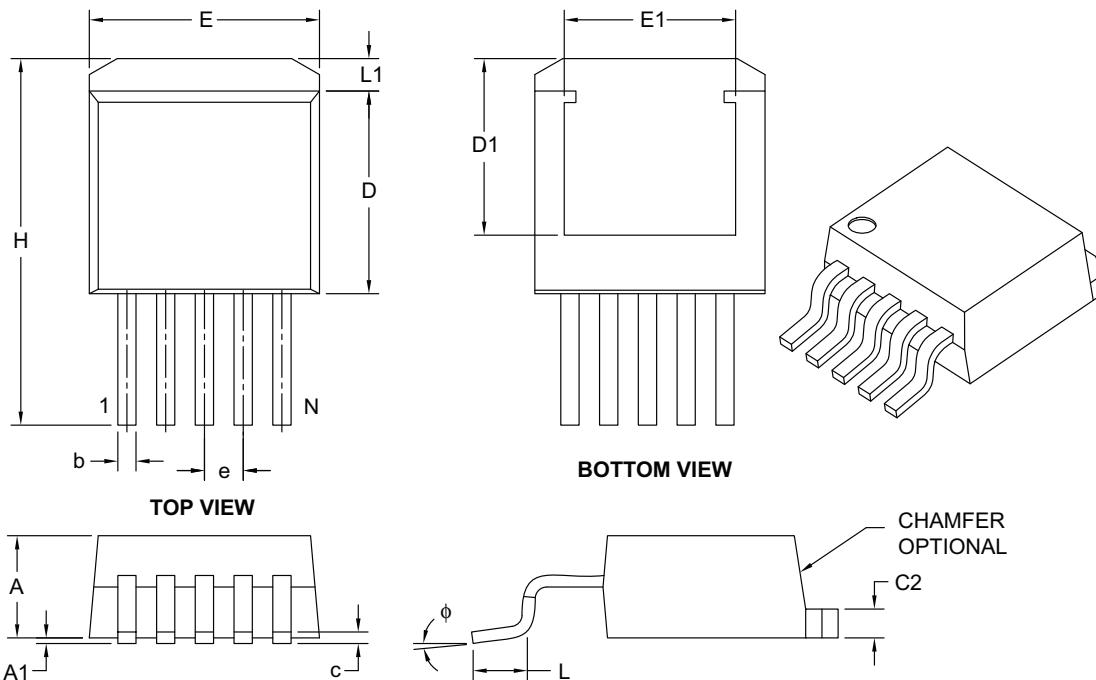
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-011B

Packaging Diagrams and Parameters

5-Lead Plastic (ET) [DDPAK]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			5	
Pitch	e			.067 BSC	
Overall Height	A	.160	—	.190	
Standoff §	A1	.000	—	.010	
Overall Width	E	.380	—	.420	
Exposed Pad Width	E1	.245	—	—	
Molded Package Length	D	.330	—	.380	
Overall Length	H	.549	—	.625	
Exposed Pad Length	D1	.270	—	—	
Lead Thickness	c	.014	—	.029	
Pad Thickness	C2	.045	—	.065	
Lead Width	b	.020	—	.039	
Foot Length	L	.068	—	.110	
Pad Length	L1	—	—	.067	
Foot Angle	ϕ	0°	—	8°	

Notes:

- § Significant Characteristic.
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Microchip Technology Drawing C04-012B

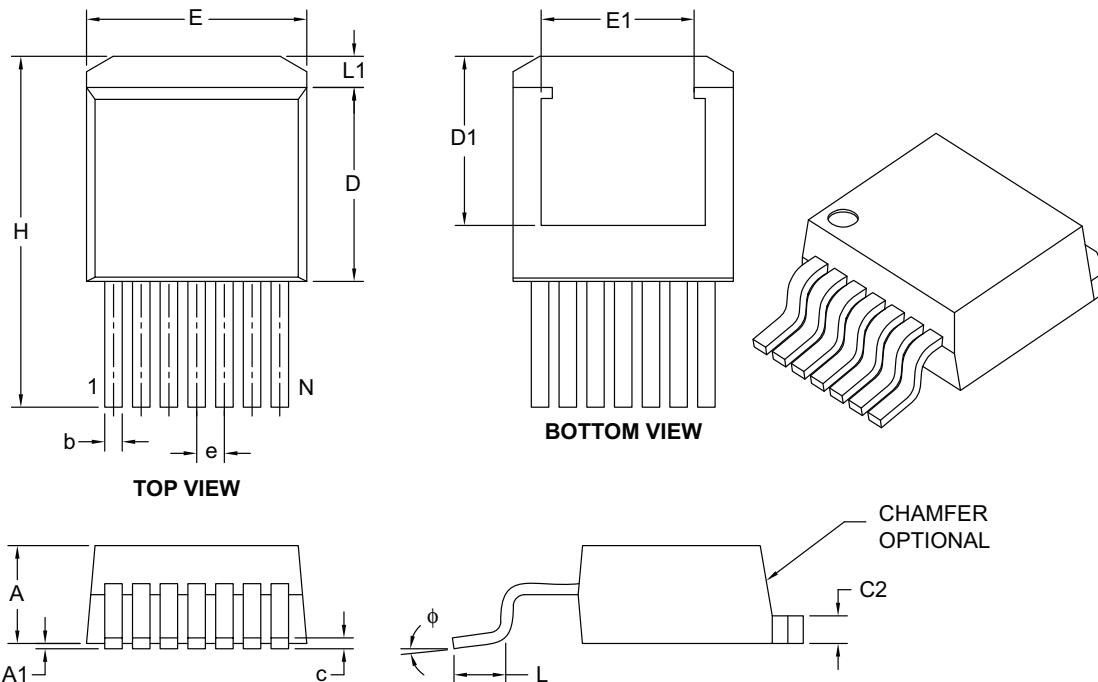
Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

7-Lead Plastic (EK) [DDPAK]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			7	
Pitch	e			.050 BSC	
Overall Height	A	.160	—	.190	
Standoff §	A1	.000	—	.010	
Overall Width	E	.380	—	.420	
Exposed Pad Width	E1	.245	—	—	
Molded Package Length	D	.330	—	.380	
Overall Length	H	.549	—	.625	
Exposed Pad Length	D1	.270	—	—	
Lead Thickness	c	.014	—	.029	
Pad Thickness	C2	.045	—	.065	
Lead Width	b	.020	—	.037	
Foot Length	L	.068	—	.110	
Pad Length	L1	—	—	.067	
Foot Angle	ϕ	0°	—	8°	

Notes:

- § Significant Characteristic.
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

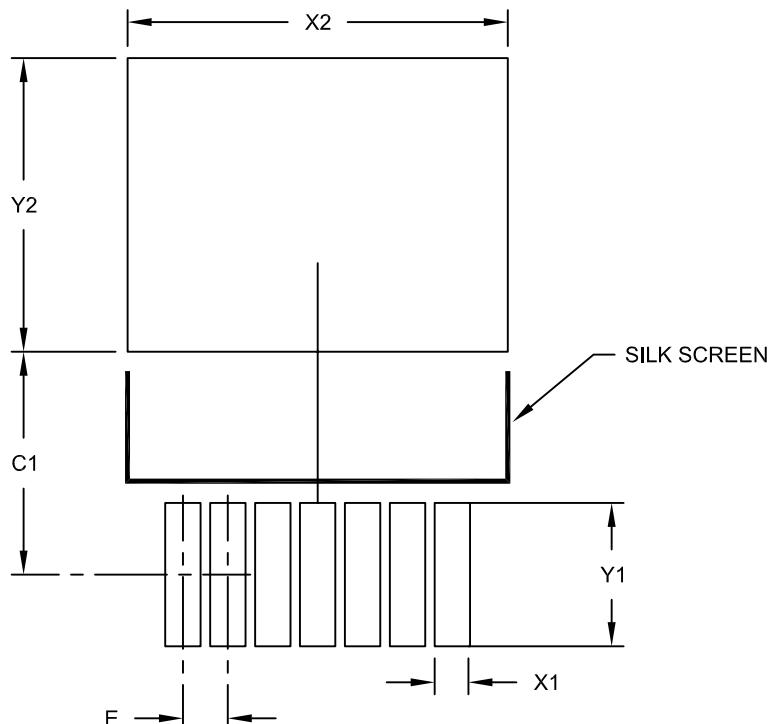
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-015B

Land Pattern (Footprint)

7-Lead Plastic (EK) [DDPAK] Land Pattern

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



RECOMMENDED LAND PATTERN

		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Contact Pitch	E		.050	BSC	
Optional Center Pad Width	X2				.423
Optional Center Pad Length	Y2				.327
Contact Pad Spacing	C1		.248		
Contact Pad Width (X28)	X1				.039
Contact Pad Length (X28)	Y1				.159

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

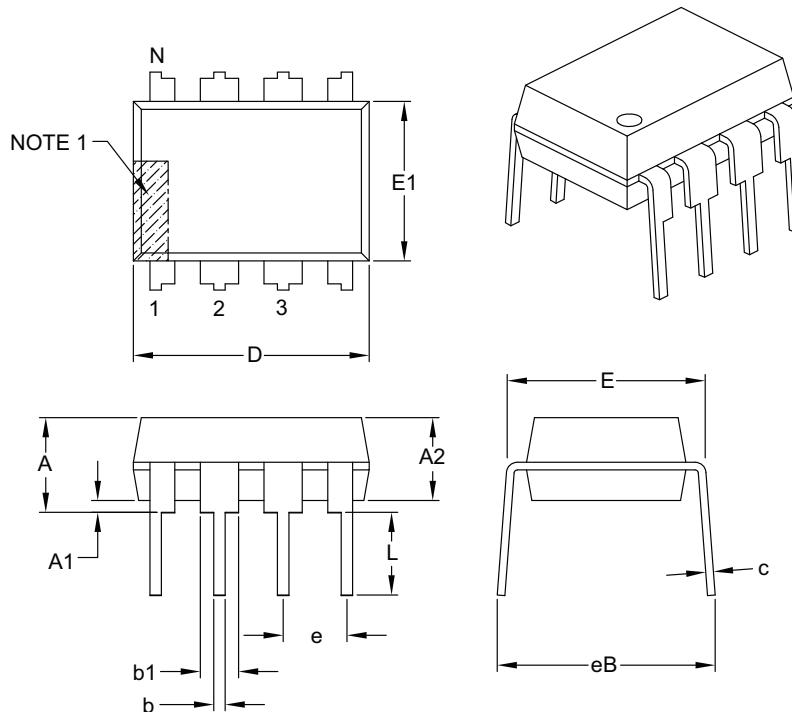
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2015A

Packaging Diagrams and Parameters

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>



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			8	
Pitch	e			.100 BSC	
Top to Seating Plane	A	—	—	.210	
Molded Package Thickness	A2	.115	.130	.195	
Base to Seating Plane	A1	.015	—	—	
Shoulder to Shoulder Width	E	.290	.310	.325	
Molded Package Width	E1	.240	.250	.280	
Overall Length	D	.348	.365	.400	
Tip to Seating Plane	L	.115	.130	.150	
Lead Thickness	c	.008	.010	.015	
Upper Lead Width	b1	.040	.060	.070	
Lower Lead Width	b	.014	.018	.022	
Overall Row Spacing §	eB	—	—	.430	

Notes:

1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

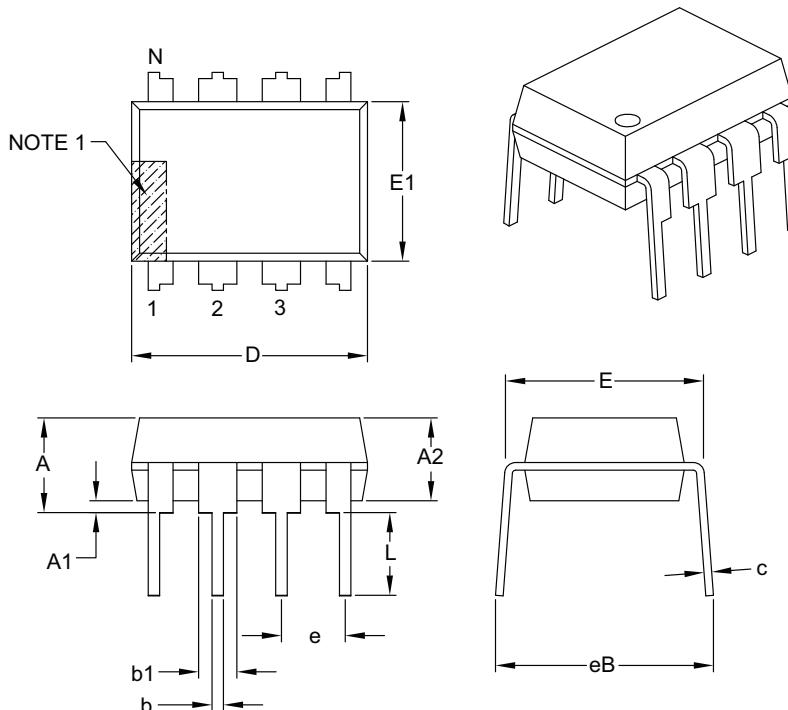
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-018B

Land Pattern (Footprint)

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

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			8	
Pitch	e			.100 BSC	
Top to Seating Plane	A	—	—	.210	
Molded Package Thickness	A2	.115	.130	.195	
Base to Seating Plane	A1	.015	—	—	
Shoulder to Shoulder Width	E	.290	.310	.325	
Molded Package Width	E1	.240	.250	.280	
Overall Length	D	.348	.365	.400	
Tip to Seating Plane	L	.115	.130	.150	
Lead Thickness	c	.008	.010	.015	
Upper Lead Width	b1	.040	.060	.070	
Lower Lead Width	b	.014	.018	.022	
Overall Row Spacing §	eB	—	—	.430	

Notes:

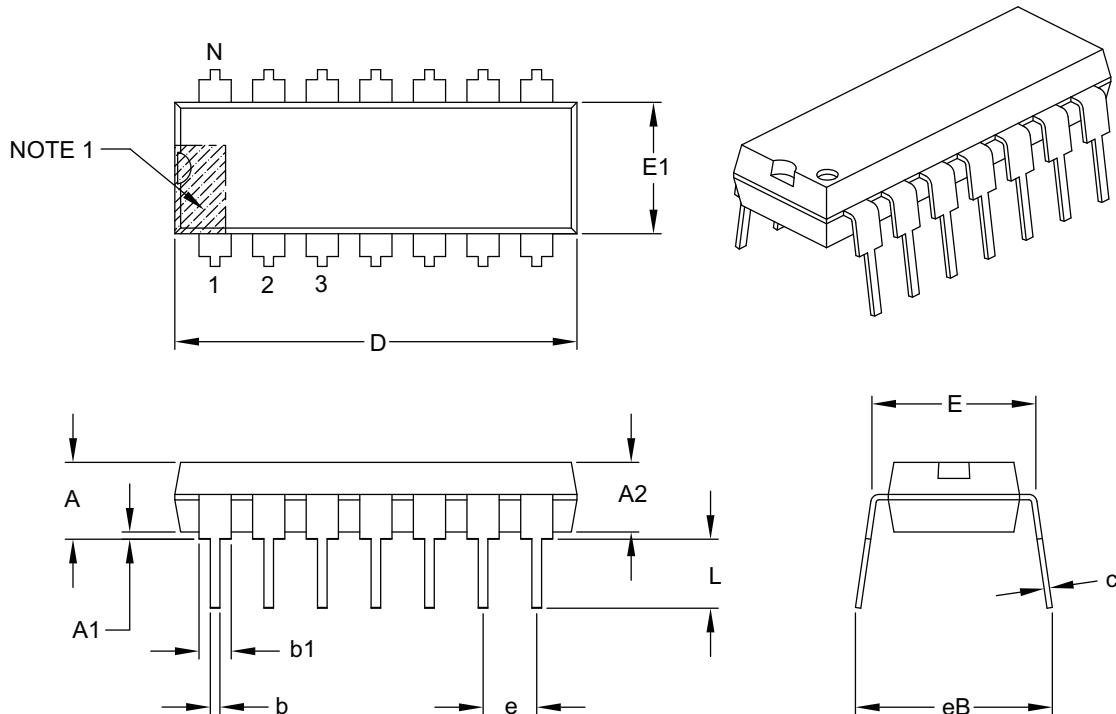
1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

14-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>



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		14	
Pitch	e		.100 BSC	
Top to Seating Plane	A	–	–	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	–	–
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.735	.750	.775
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

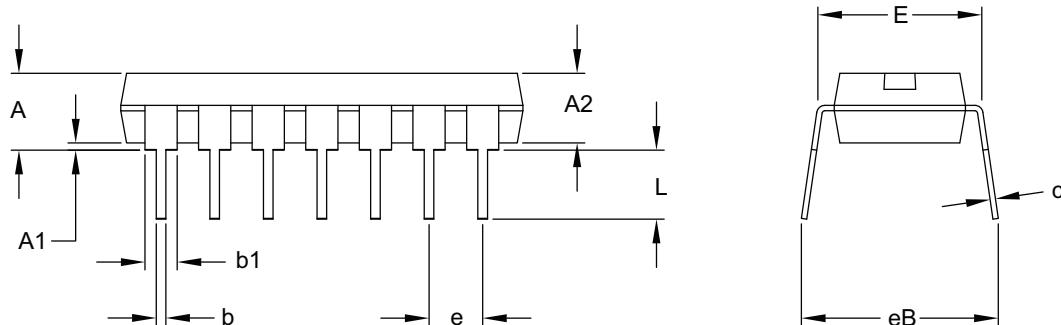
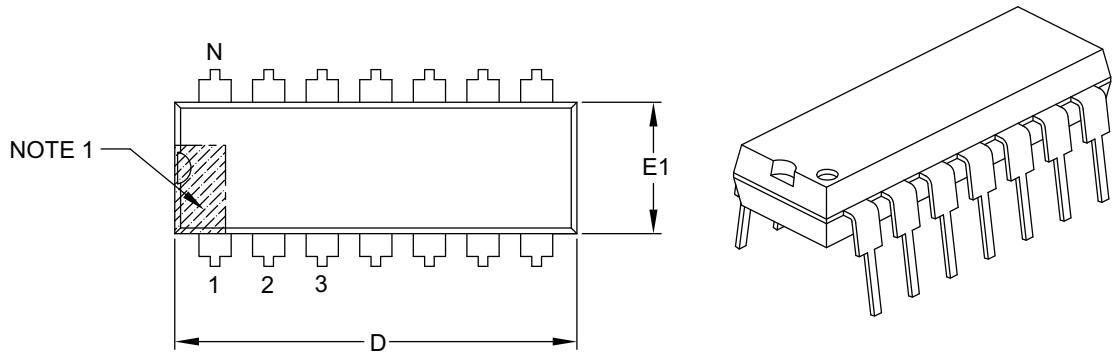
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-005B

Packaging Diagrams and Parameters

14-Lead Plastic Dual In-Line (PD) – 300 mil Body [PDIP]

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



	Dimension Limits	INCHES		
		MIN	NOM	MAX
Number of Pins	N		14	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.735	.750	.775
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	—	—	.430

Notes:

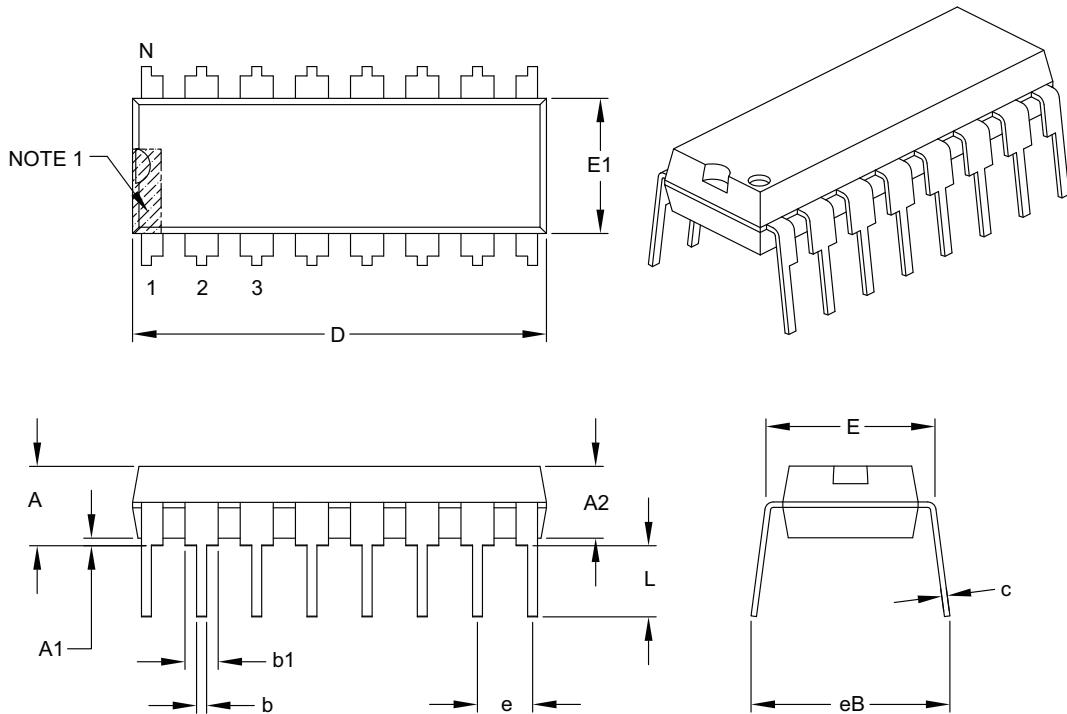
1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

16-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>



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	16		
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.735	.755	.775
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	—	—	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

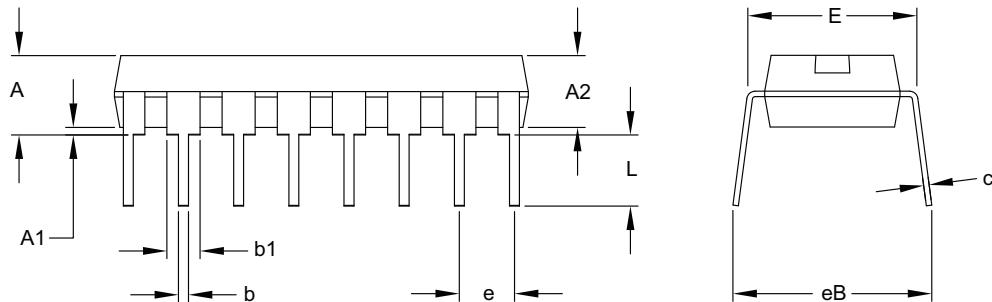
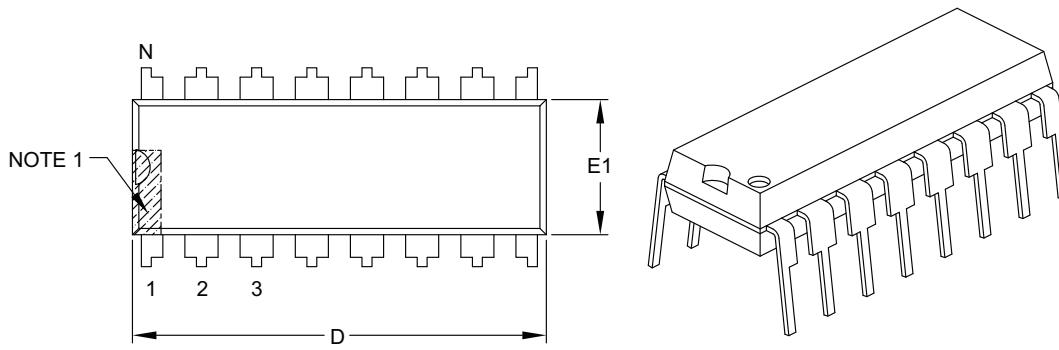
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-017B

Packaging Diagrams and Parameters

16-Lead Plastic Dual In-Line (PE) – 300 mil Body [PDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		16	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.290	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.735	.755	.775
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	—	—	.430

Notes:

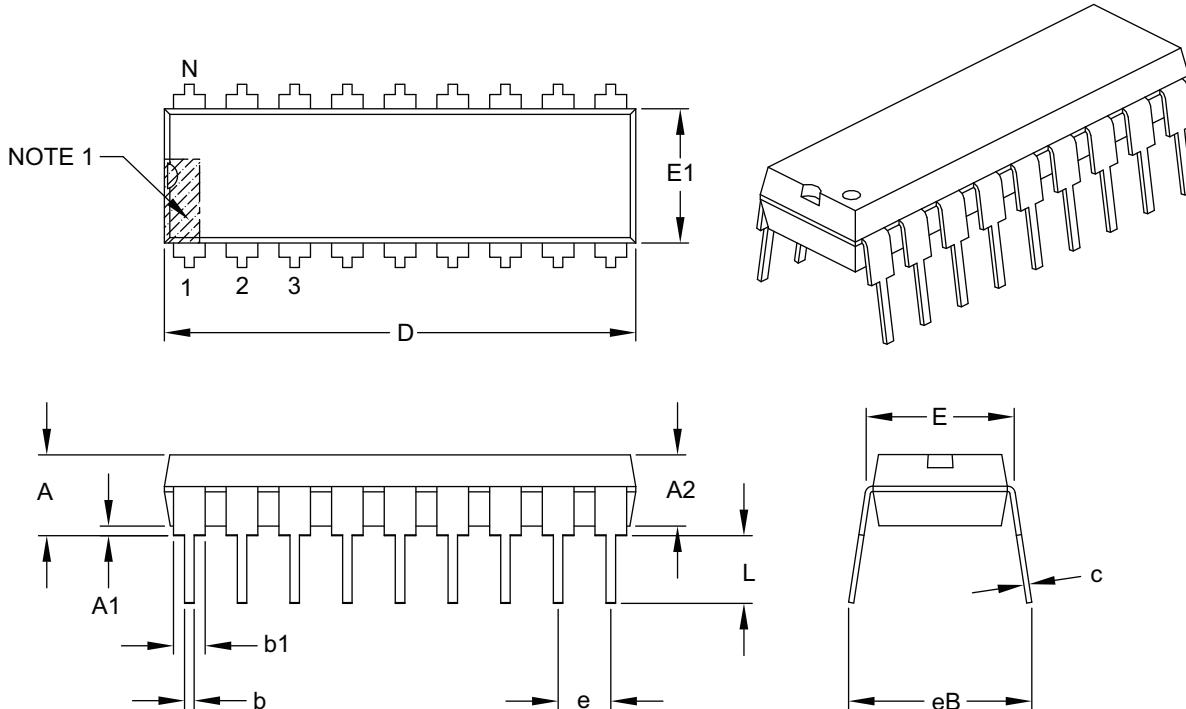
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

18-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>



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			18	
Pitch	e			.100 BSC	
Top to Seating Plane	A	–	–	.210	
Molded Package Thickness	A2	.115	.130	.195	
Base to Seating Plane	A1	.015	–	–	
Shoulder to Shoulder Width	E	.300	.310	.325	
Molded Package Width	E1	.240	.250	.280	
Overall Length	D	.880	.900	.920	
Tip to Seating Plane	L	.115	.130	.150	
Lead Thickness	c	.008	.010	.014	
Upper Lead Width	b1	.045	.060	.070	
Lower Lead Width	b	.014	.018	.022	
Overall Row Spacing §	eB	–	–	.430	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

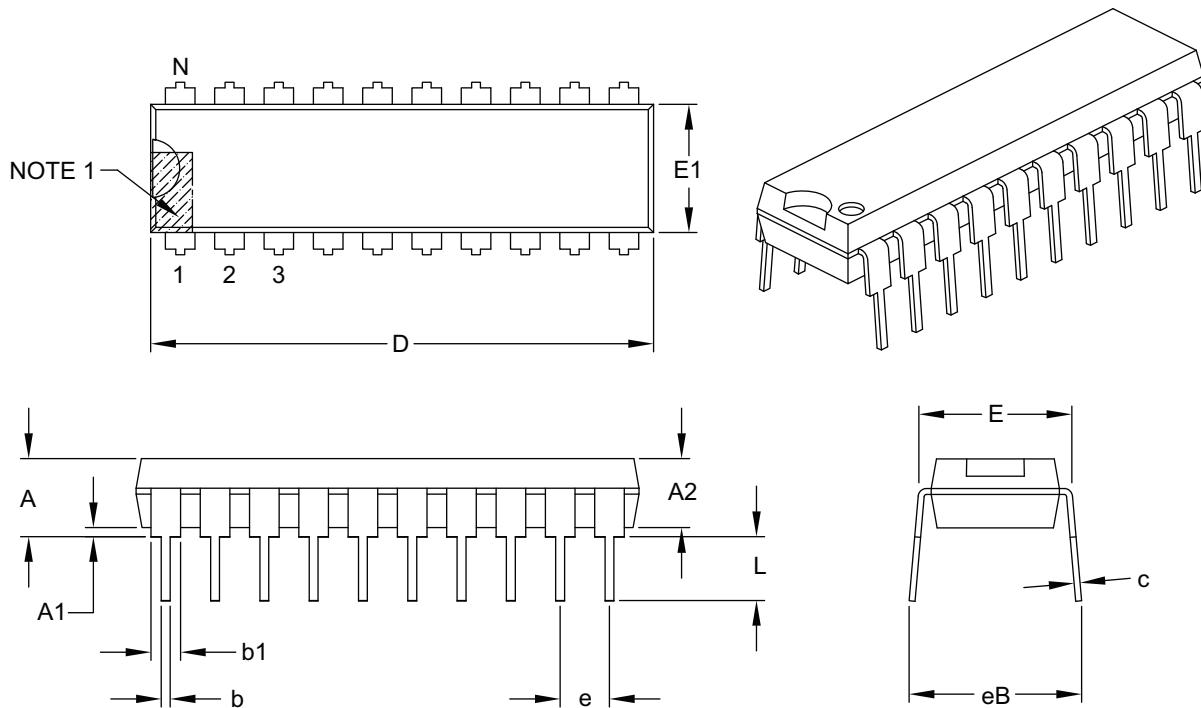
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-007B

Packaging Diagrams and Parameters

20-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>



Dimension	Limits	INCHES		
		MIN	NOM	MAX
Number of Pins	N		20	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.300	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	.980	1.030	1.060
Tip to Seating Plane	L	.115	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	—	—	.430

Notes:

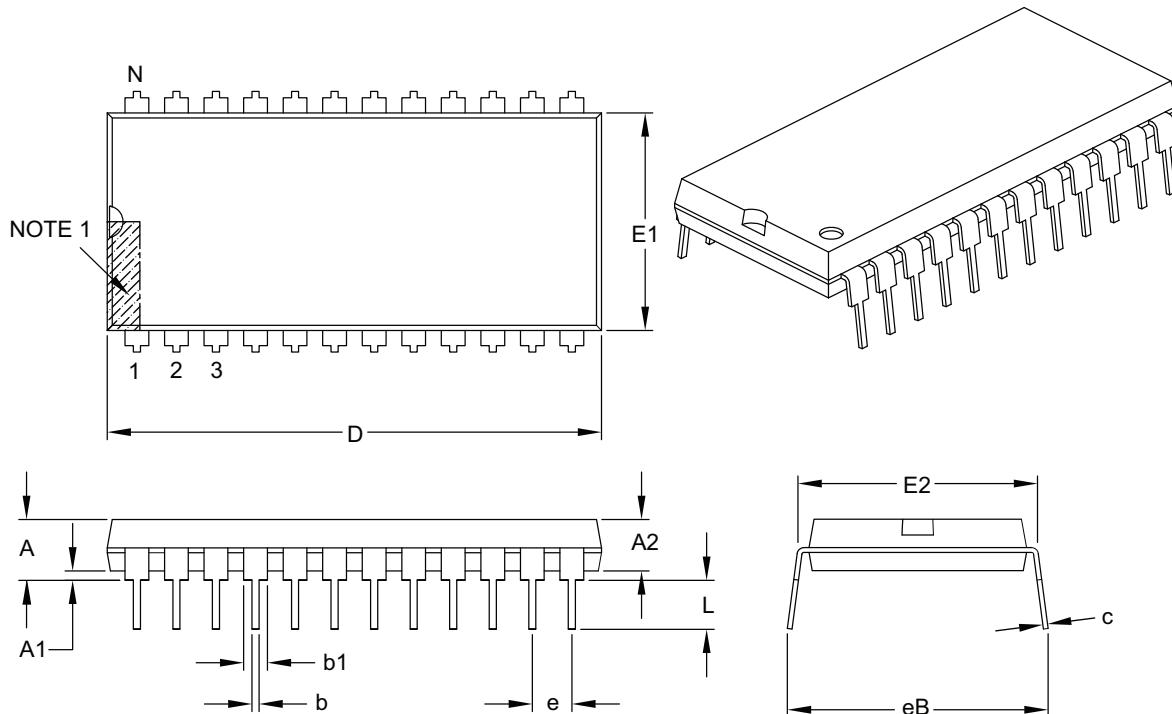
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

24-Lead Plastic Dual In-Line (P) – 600 mil Body [PDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	.100 BSC		
Top to Seating Plane	A	—	—	.250
Molded Package Thickness	A2	.125	—	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.590	—	.625
Molded Package Width	E1	.485	—	.580
Overall Length	D	1.150	—	1.290
Tip to Seating Plane	L	.115	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.030	—	.070
Lower Lead Width	b	.014	—	.022
Overall Row Spacing §	eB	—	—	.700

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

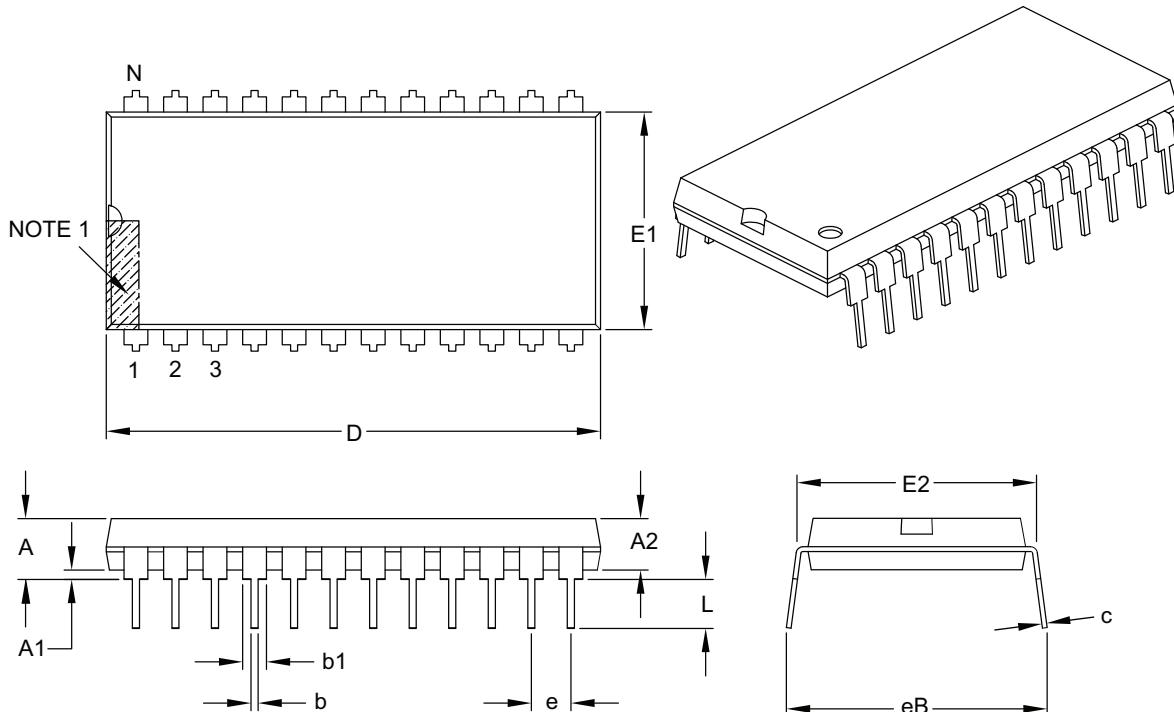
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-081B

Packaging Diagrams and Parameters

24-Lead Plastic Dual In-Line (PG) – 600 mil Body [PDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		24	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.250
Molded Package Thickness	A2	.125	—	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.590	—	.625
Molded Package Width	E1	.485	—	.580
Overall Length	D	1.150	—	1.290
Tip to Seating Plane	L	.115	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.030	—	.070
Lower Lead Width	b	.014	—	.022
Overall Row Spacing §	eB	—	—	.700

Notes:

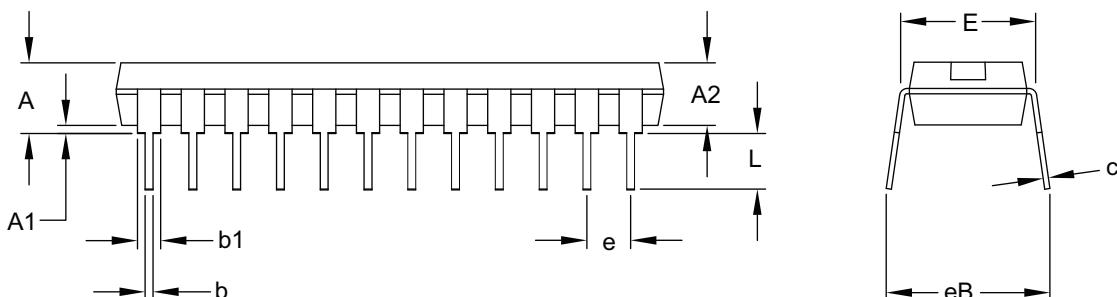
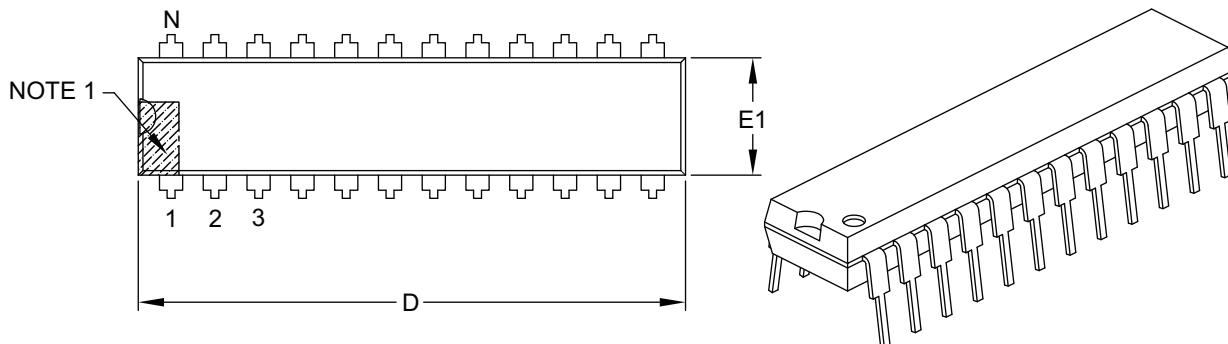
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

24-Lead Skinny Plastic Dual In-Line (SP) – 300 mil Body [SPDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	24		
Pitch	e	.100	BSC	
Top to Seating Plane	A	—	—	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.280	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	1.155	1.250	1.280
Tip to Seating Plane	L	.115	.130	.160
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.023
Overall Row Spacing §	eB	—	—	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

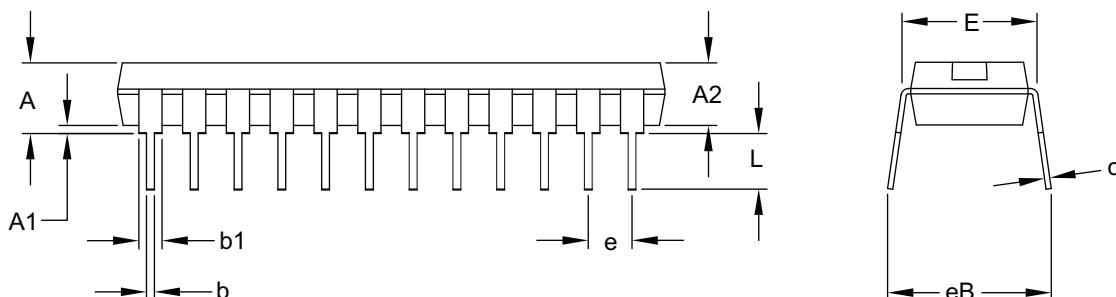
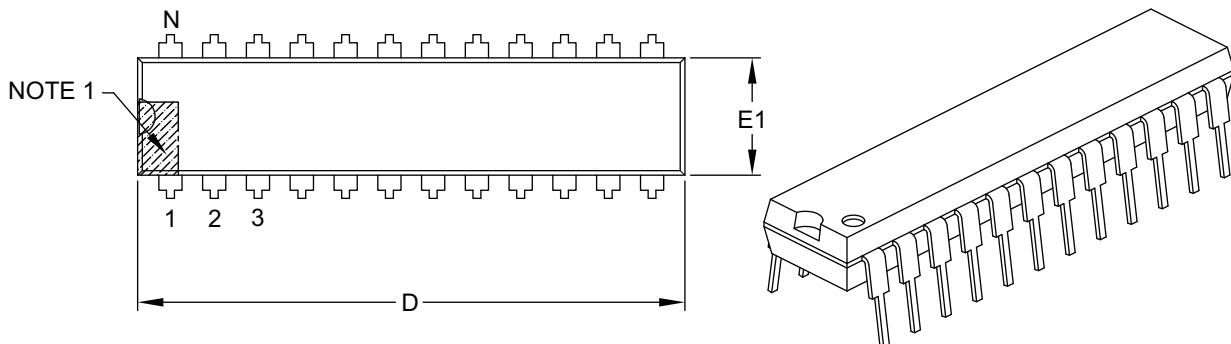
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-043B

Packaging Diagrams and Parameters

24-Lead Skinny Plastic Dual In-Line (PF) – 300 mil Body [SPDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		24	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.210
Molded Package Thickness	A2	.115	.130	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.280	.310	.325
Molded Package Width	E1	.240	.250	.280
Overall Length	D	1.155	1.250	1.280
Tip to Seating Plane	L	.115	.130	.160
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.045	.060	.070
Lower Lead Width	b	.014	.018	.023
Overall Row Spacing §	eB	—	—	.430

Notes:

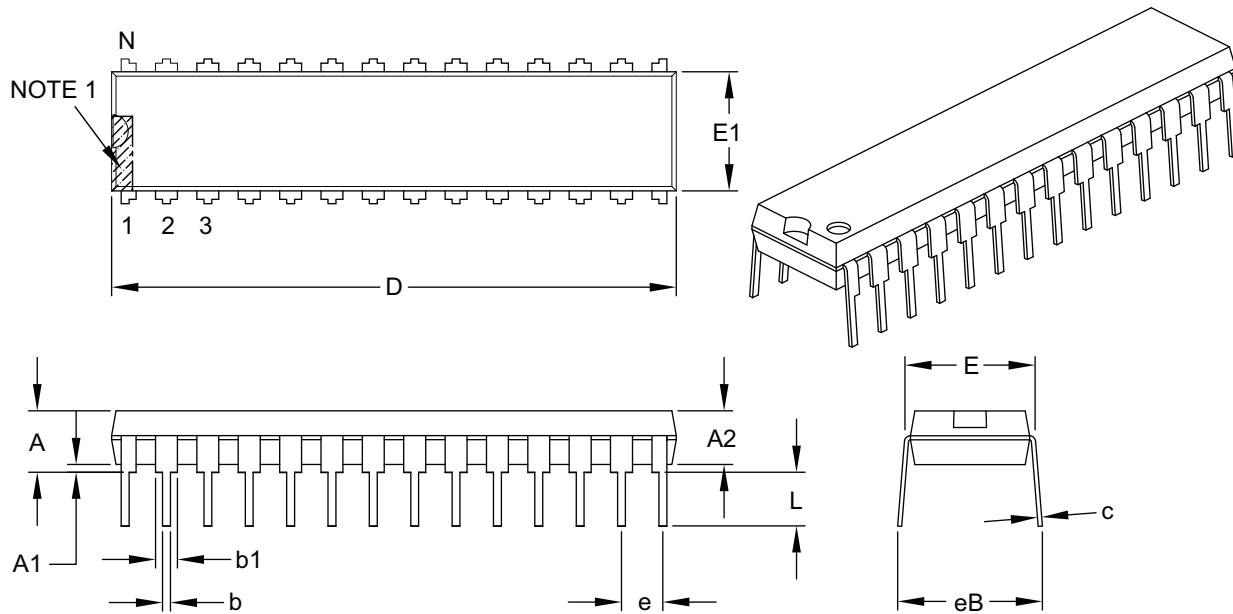
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

28-Lead Skinny Plastic Dual In-Line (SP) – 300 mil Body [SPDIP]

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



Dimension Limits		INCHES		
		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.200
Molded Package Thickness	A2	.120	.135	.150
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.290	.310	.335
Molded Package Width	E1	.240	.285	.295
Overall Length	D	1.345	1.365	1.400
Tip to Seating Plane	L	.110	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.040	.050	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	—	—	.430

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

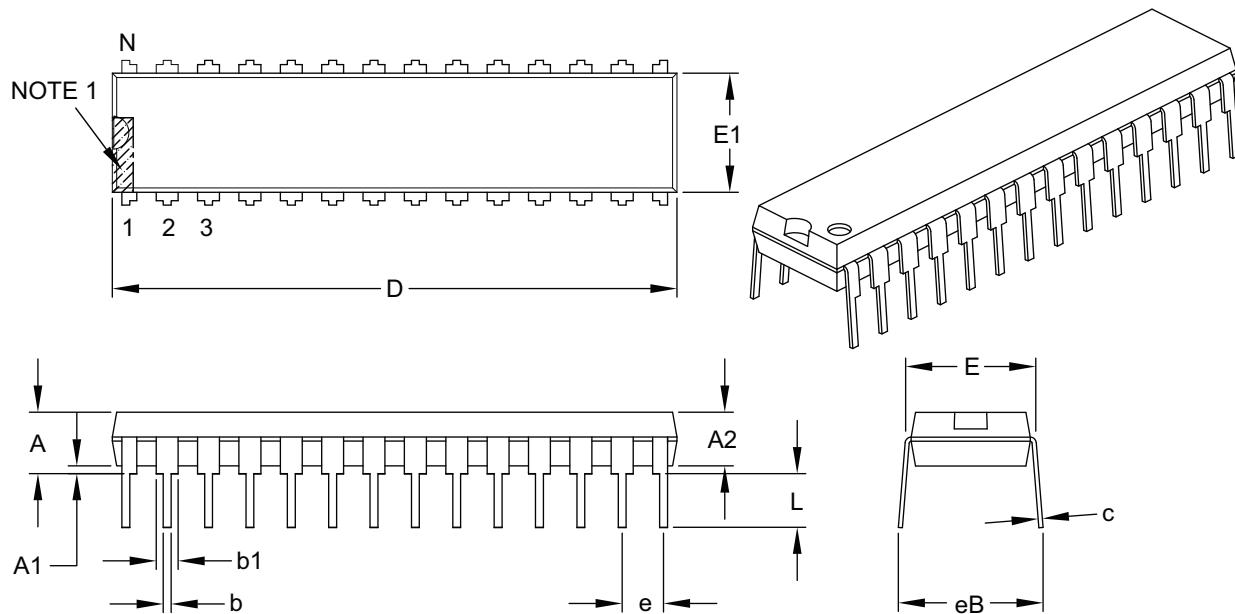
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-070B

Packaging Diagrams and Parameters

28-Lead Skinny Plastic Dual In-Line (PJ) – 300 mil Body [SPDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.200
Molded Package Thickness	A2	.120	.135	.150
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.290	.310	.335
Molded Package Width	E1	.240	.285	.295
Overall Length	D	1.345	1.365	1.400
Tip to Seating Plane	L	.110	.130	.150
Lead Thickness	c	.008	.010	.015
Upper Lead Width	b1	.040	.050	.070
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	—	—	.430

Notes:

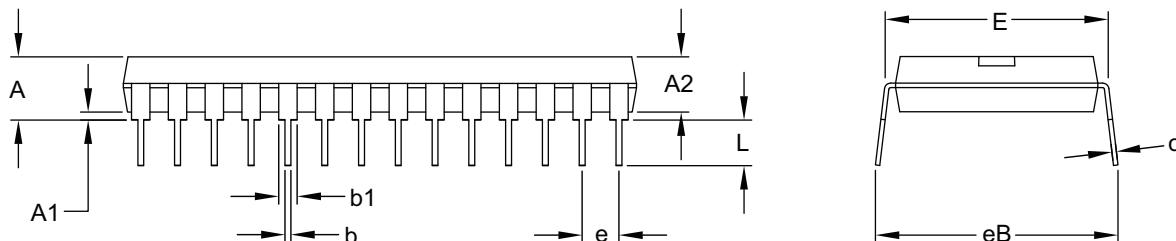
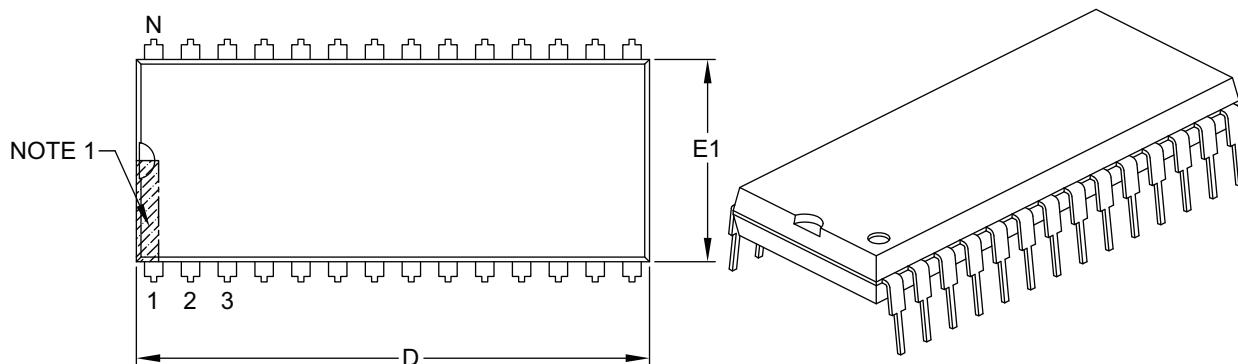
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

28-Lead Plastic Dual In-Line (P) – 600 mil Body [PDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.250
Molded Package Thickness	A2	.125	—	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.590	—	.625
Molded Package Width	E1	.485	—	.580
Overall Length	D	1.380	—	1.565
Tip to Seating Plane	L	.115	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.030	—	.070
Lower Lead Width	b	.014	—	.022
Overall Row Spacing §	eB	—	—	.700

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

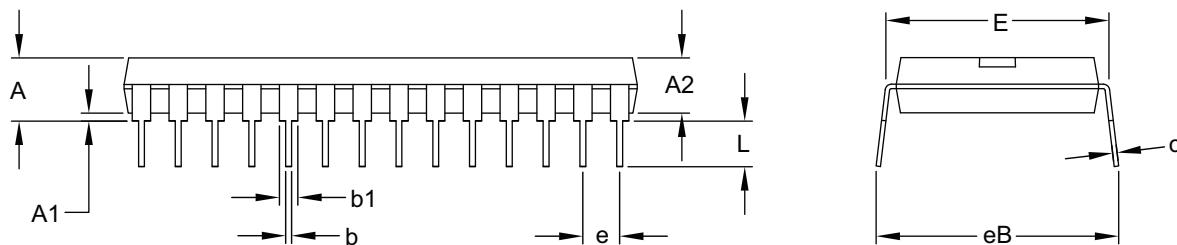
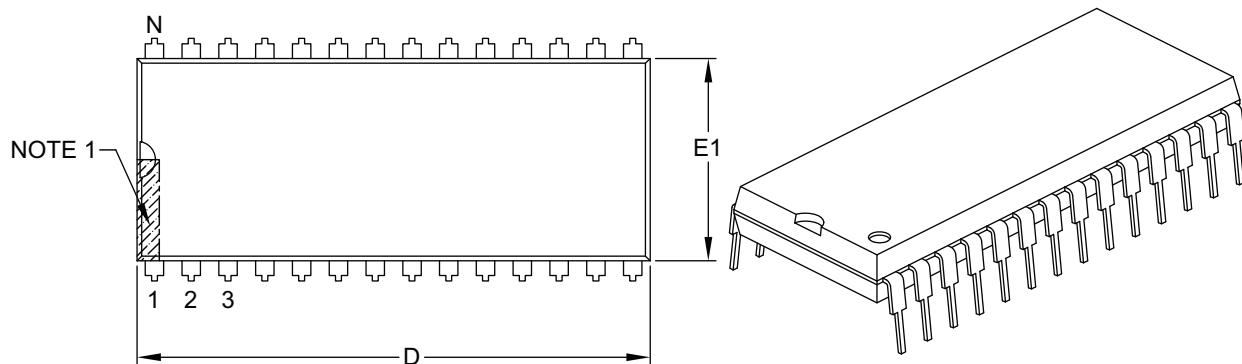
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-079B

Packaging Diagrams and Parameters

28-Lead Plastic Dual In-Line (PDI) – 600 mil Body [PDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.250
Molded Package Thickness	A2	.125	—	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.590	—	.625
Molded Package Width	E1	.485	—	.580
Overall Length	D	1.380	—	1.565
Tip to Seating Plane	L	.115	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.030	—	.070
Lower Lead Width	b	.014	—	.022
Overall Row Spacing §	eB	—	—	.700

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

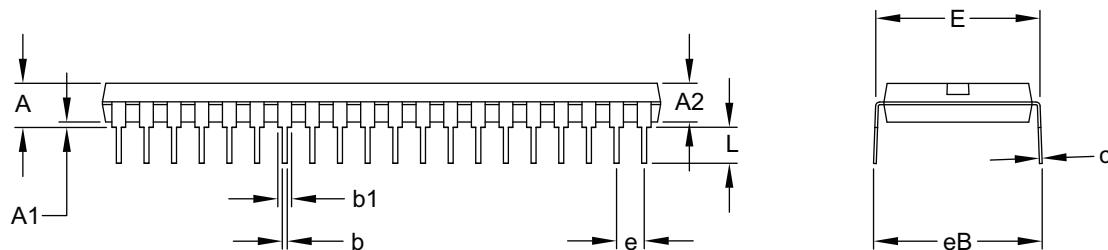
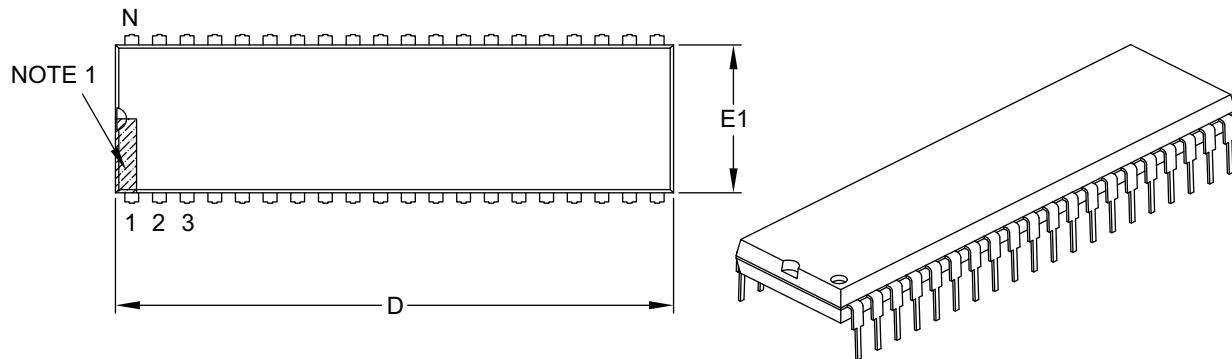
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-079B

Packaging Diagrams and Parameters

40-Lead Plastic Dual In-Line (P) – 600 mil Body [PDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	40		
Pitch	e	.100 BSC		
Top to Seating Plane	A	—	—	.250
Molded Package Thickness	A2	.125	—	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.590	—	.625
Molded Package Width	E1	.485	—	.580
Overall Length	D	1.980	—	2.095
Tip to Seating Plane	L	.115	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.030	—	.070
Lower Lead Width	b	.014	—	.023
Overall Row Spacing §	eB	—	—	.700

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

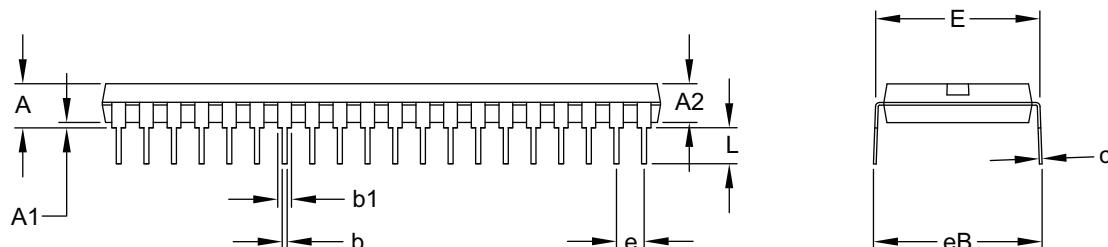
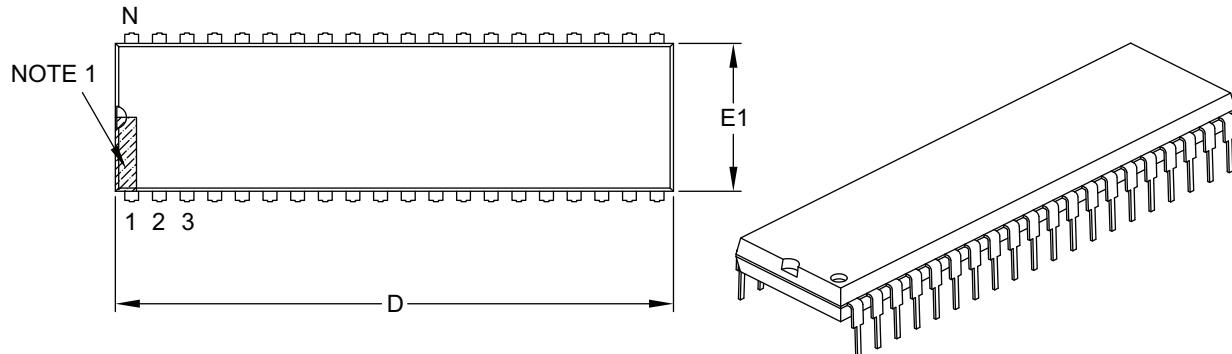
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-016B

Packaging Diagrams and Parameters

40-Lead Plastic Dual In-Line (PL) – 600 mil Body [PDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		40	
Pitch	e		.100 BSC	
Top to Seating Plane	A	—	—	.250
Molded Package Thickness	A2	.125	—	.195
Base to Seating Plane	A1	.015	—	—
Shoulder to Shoulder Width	E	.590	—	.625
Molded Package Width	E1	.485	—	.580
Overall Length	D	1.980	—	2.095
Tip to Seating Plane	L	.115	—	.200
Lead Thickness	c	.008	—	.015
Upper Lead Width	b1	.030	—	.070
Lower Lead Width	b	.014	—	.023
Overall Row Spacing §	eB	—	—	.700

Notes:

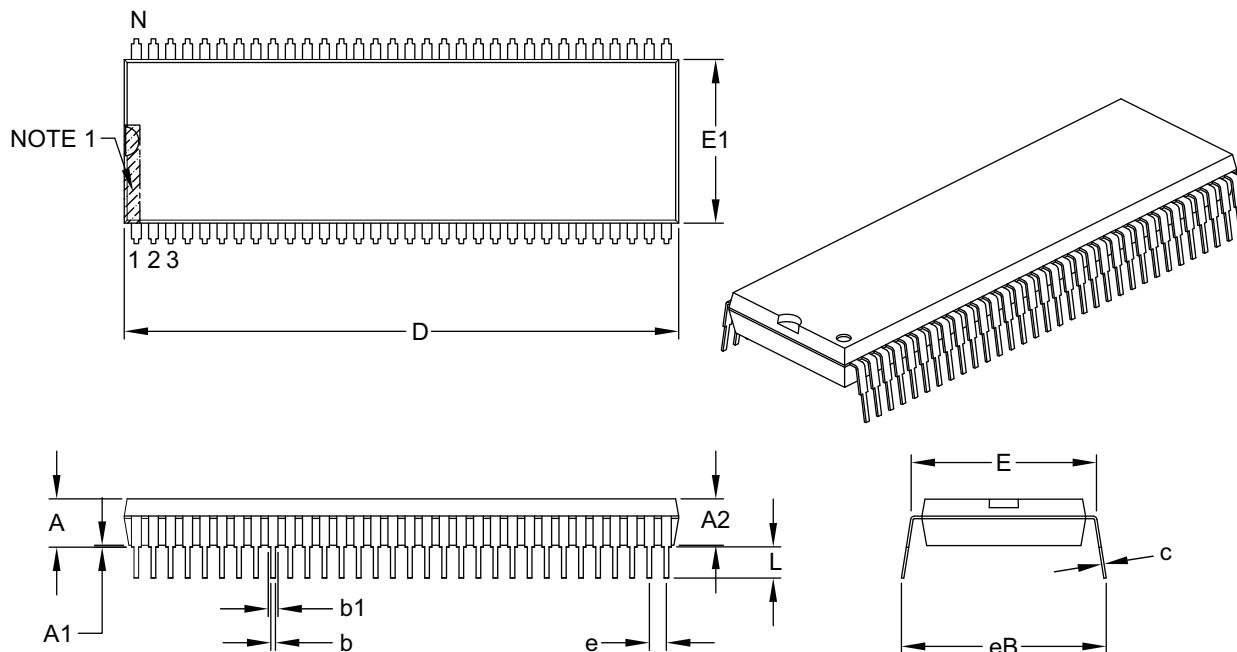
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

64-Lead Shrink Plastic Dual In-Line (SP) – 750 mil Body [PDIP]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N	64		
Pitch	e	.070 BSC		
Top to Seating Plane	A	–	–	.200
Molded Package Thickness	A2	.120	.150	.180
Base to Seating Plane	A1	.020	–	–
Shoulder to Shoulder Width	E	.750	–	.785
Molded Package Width	E1	.650	.670	.690
Overall Length	D	2.260	2.270	2.280
Tip to Seating Plane	L	.100	.130	.150
Lead Thickness	c	.009	.010	.015
Upper Lead Width	b1	.035	.040	.045
Lower Lead Width	b	.014	.018	.022
Overall Row Spacing §	eB	–	–	.880

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

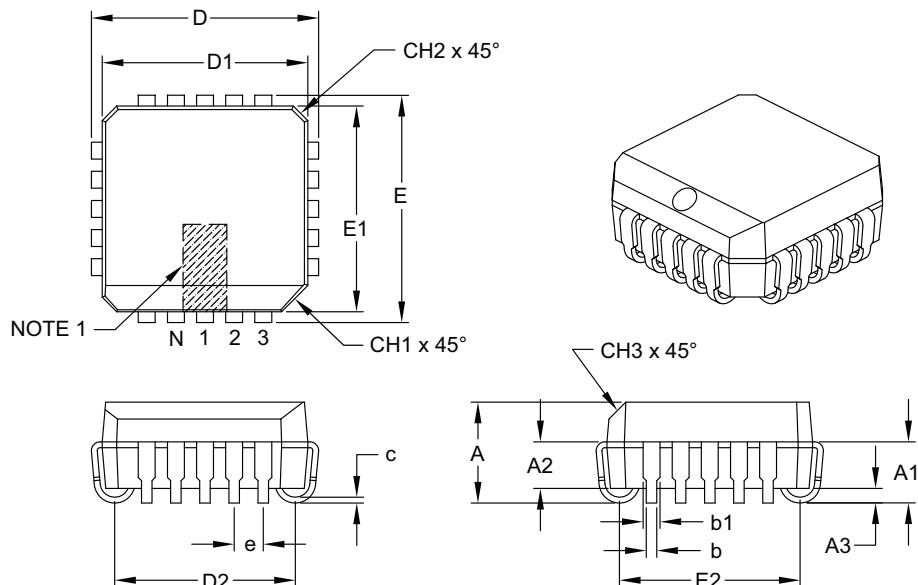
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-090B

Packaging Diagrams and Parameters

20-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		20	
Pitch	e		.050	
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.385	.390	.395
Overall Length	D	.385	.390	.395
Molded Package Width	E1	.350	.353	.356
Molded Package Length	D1	.350	.353	.356
Footprint Width	E2	.282	.310	.338
Footprint Length	D2	.282	.310	.338
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

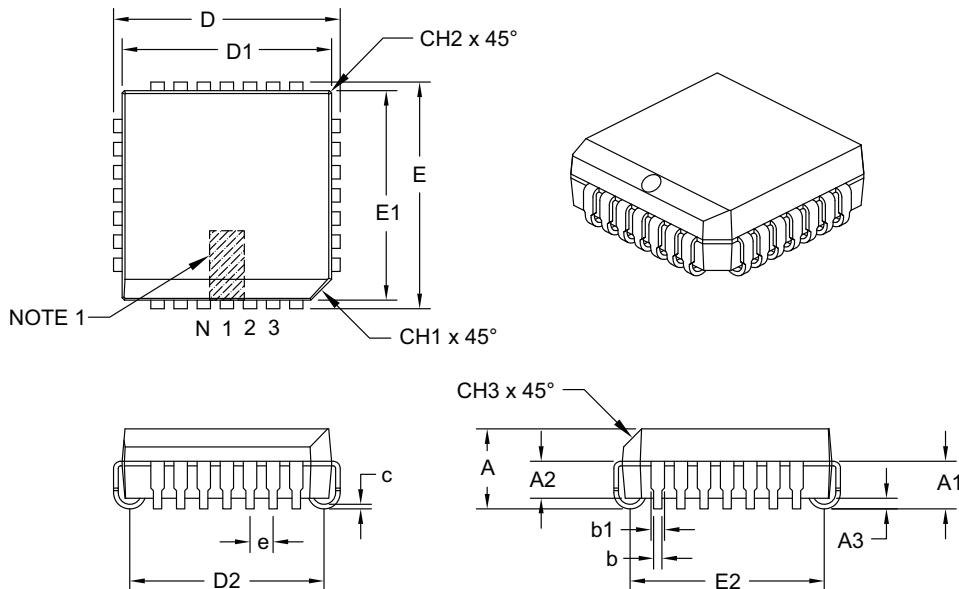
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

28-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.050	
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	—	.083
Standoff §	A3	.020	—	—
Corner Chamfer	CH1	.042	—	.048
Chamfers	CH2	—	—	.020
Side Chamfer	CH3	.042	—	.056
Overall Width	E	.485	.490	.495
Overall Length	D	.485	.490	.495
Molded Package Width	E1	.450	.453	.456
Molded Package Length	D1	.450	.453	.456
Footprint Width	E2	.382	.410	.438
Footprint Length	D2	.382	.410	.438
Lead Thickness	c	.0075	—	.0125
Upper Lead Width	b1	.026	—	.032
Lower Lead Width	b	.013	—	.021

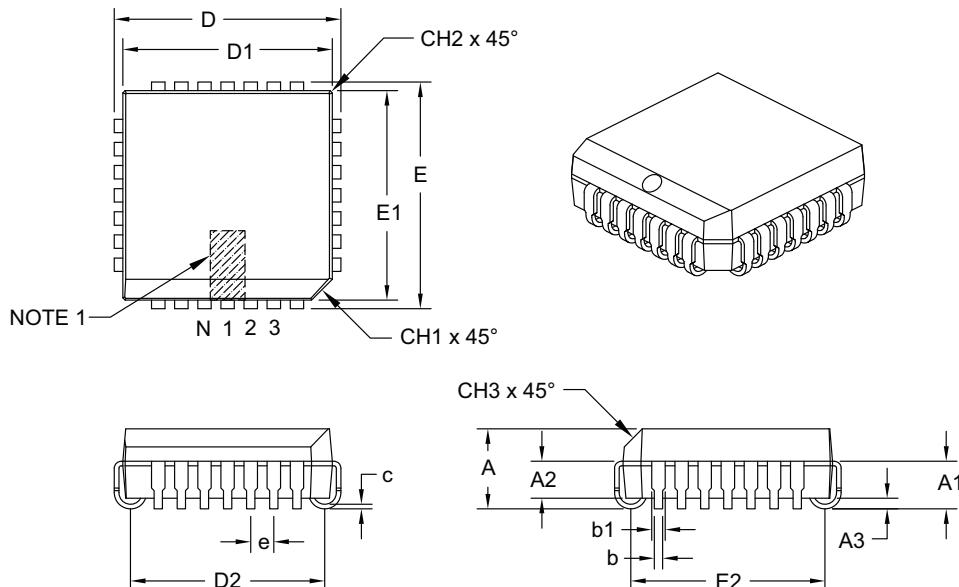
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

28-Lead Plastic Leaded Chip Carrier (L1) – Square [PLCC]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		28	
Pitch	e		.050	
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	—	.083
Standoff §	A3	.020	—	—
Corner Chamfer	CH1	.042	—	.048
Chamfers	CH2	—	—	.020
Side Chamfer	CH3	.042	—	.056
Overall Width	E	.485	.490	.495
Overall Length	D	.485	.490	.495
Molded Package Width	E1	.450	.453	.456
Molded Package Length	D1	.450	.453	.456
Footprint Width	E2	.382	.410	.438
Footprint Length	D2	.382	.410	.438
Lead Thickness	c	.0075	—	.0125
Upper Lead Width	b1	.026	—	.032
Lower Lead Width	b	.013	—	.021

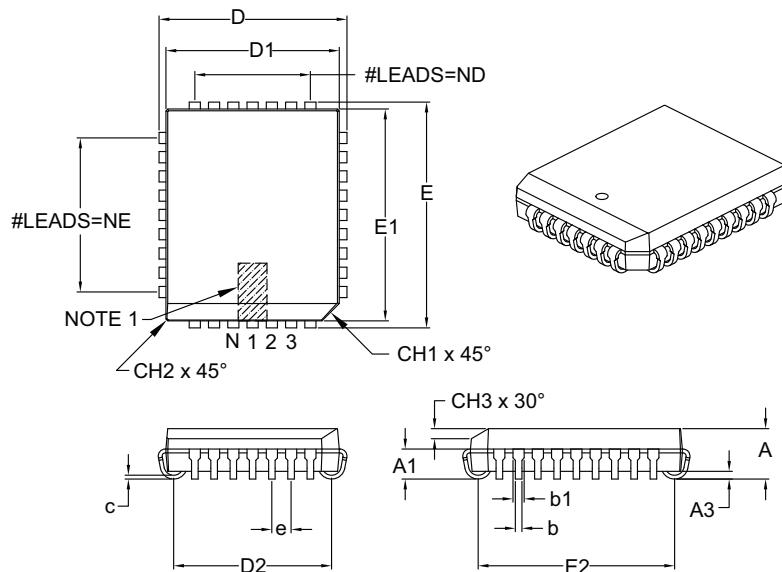
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

32-Lead Plastic Leaded Chip Carrier (L) – Rectangle [PLCC]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		.32	
Pitch	e		.050	
Pins along Length	ND		.7	
Pins along Width	NE		.9	
Overall Height	A	.125	—	.140
Contact Height	A1	.060	—	.095
Standoff §	A3	.015	—	—
Corner Chamfer	CH1	.042	—	.048
Chamfers	CH2	—	—	.020
Side Chamfer Height	CH3	.023	—	.029
Overall Length	D	.485	—	.495
Overall Width	E	.585	—	.595
Molded Package Length	D1	.447	—	.453
Molded Package Width	E1	.547	—	.553
Footprint Length	D2	.376	—	.446
Footprint Width	E2	.476	—	.546
Lead Thickness	c	.008	—	.013
Upper Lead Width	b1	.026	—	.032
Lower Lead Width	b	.013	—	.021

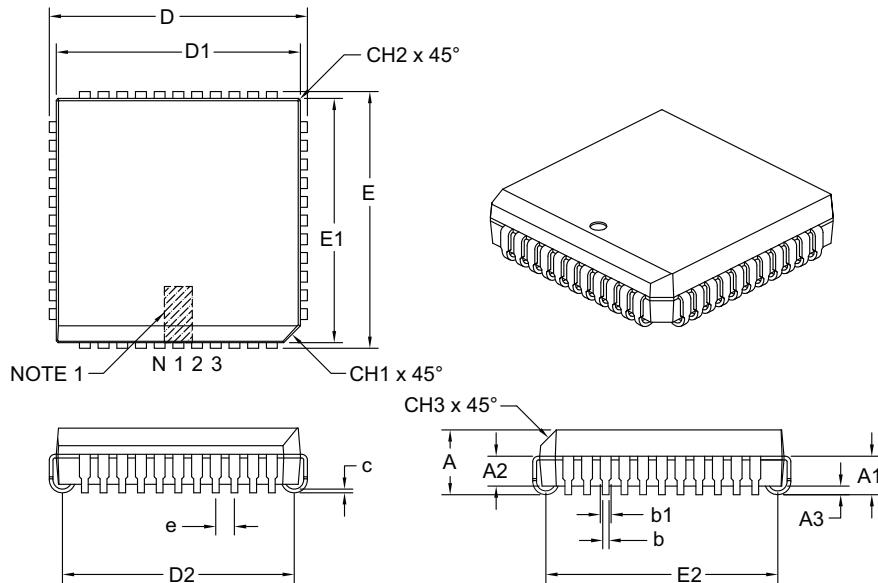
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

44-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N		44		
Pitch	e		.050		
Overall Height	A	.165	.172	.180	
Contact Height	A1	.090	.105	.120	
Molded Package to Contact	A2	.062	—	.083	
Standoff §	A3	.020	—	—	
Corner Chamfer	CH1	.042	—	.048	
Chamfers	CH2	—	—	.020	
Side Chamfer	CH3	.042	—	.056	
Overall Width	E	.685	.690	.695	
Overall Length	D	.685	.690	.695	
Molded Package Width	E1	.650	.653	.656	
Molded Package Length	D1	.650	.653	.656	
Footprint Width	E2	.582	.610	.638	
Footprint Length	D2	.582	.610	.638	
Lead Thickness	c	.0075	—	.0125	
Upper Lead Width	b1	.026	—	.032	
Lower Lead Width	b	.013	—	.021	

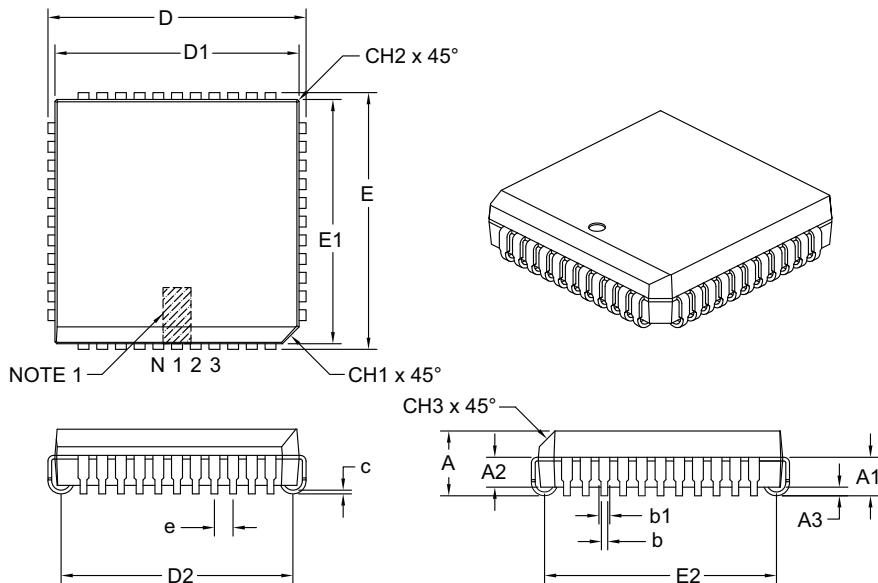
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

44-Lead Plastic Leaded Chip Carrier (LW) – Square [PLCC]

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



Units		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		44	
Pitch	e		.050	
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	—	.083
Standoff §	A3	.020	—	—
Corner Chamfer	CH1	.042	—	.048
Chamfers	CH2	—	—	.020
Side Chamfer	CH3	.042	—	.056
Overall Width	E	.685	.690	.695
Overall Length	D	.685	.690	.695
Molded Package Width	E1	.650	.653	.656
Molded Package Length	D1	.650	.653	.656
Footprint Width	E2	.582	.610	.638
Footprint Length	D2	.582	.610	.638
Lead Thickness	c	.0075	—	.0125
Upper Lead Width	b1	.026	—	.032
Lower Lead Width	b	.013	—	.021

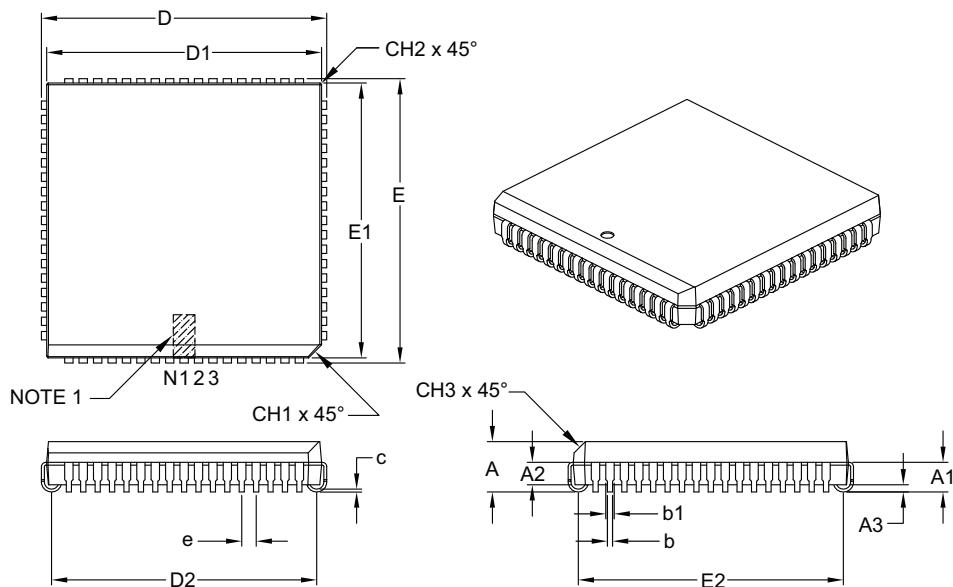
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

68-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

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



Dimension	Limits	INCHES		
		MIN	NOM	MAX
Number of Pins	N		68	
Pitch	e		.050	
Overall Height	A	.165	.172	.180
Contact Height	A1	.090	.105	.120
Molded Package to Contact	A2	.062	–	.083
Standoff §	A3	.020	–	–
Corner Chamfer	CH1	.042	–	.048
Chamfers	CH2	–	–	.020
Side Chamfer	CH3	.042	–	.056
Overall Width	E	.985	.990	.995
Overall Length	D	.985	.990	.995
Molded Package Width	E1	.950	.954	.958
Molded Package Length	D1	.950	.954	.958
Footprint Width	E2	.882	.910	.938
Footprint Length	D2	.882	.910	.938
Lead Thickness	c	.0075	–	.0125
Upper Lead Width	b1	.026	–	.032
Lower Lead Width	b	.013	–	.021

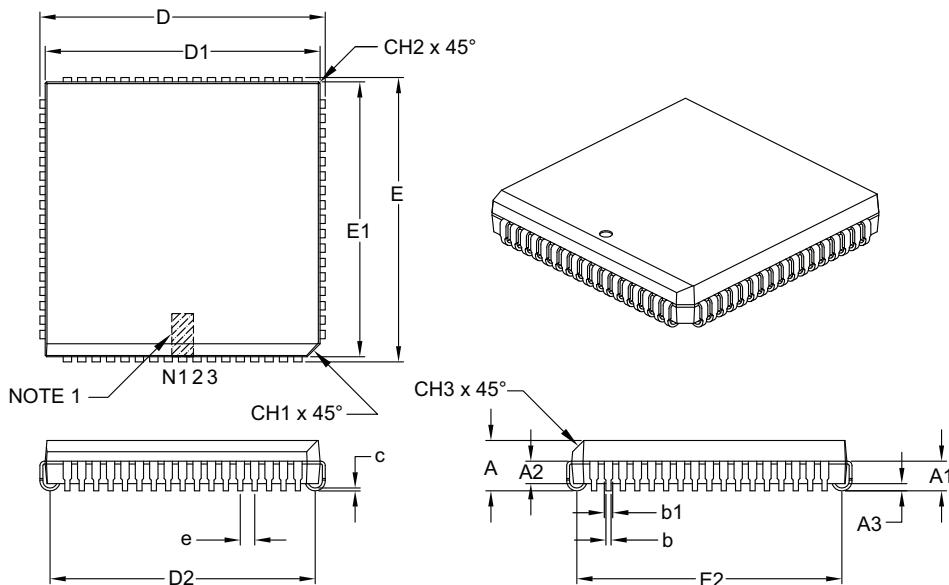
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

68-Lead Plastic Leaded Chip Carrier (LS) – Square [PLCC]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			.68	
Pitch	e			.050	
Overall Height	A	.165	.172	.180	
Contact Height	A1	.090	.105	.120	
Molded Package to Contact	A2	.062	—	.083	
Standoff §	A3	.020	—	—	
Corner Chamfer	CH1	.042	—	.048	
Chamfers	CH2	—	—	.020	
Side Chamfer	CH3	.042	—	.056	
Overall Width	E	.985	.990	.995	
Overall Length	D	.985	.990	.995	
Molded Package Width	E1	.950	.954	.958	
Molded Package Length	D1	.950	.954	.958	
Footprint Width	E2	.882	.910	.938	
Footprint Length	D2	.882	.910	.938	
Lead Thickness	c	.0075	—	.0125	
Upper Lead Width	b1	.026	—	.032	
Lower Lead Width	b	.013	—	.021	

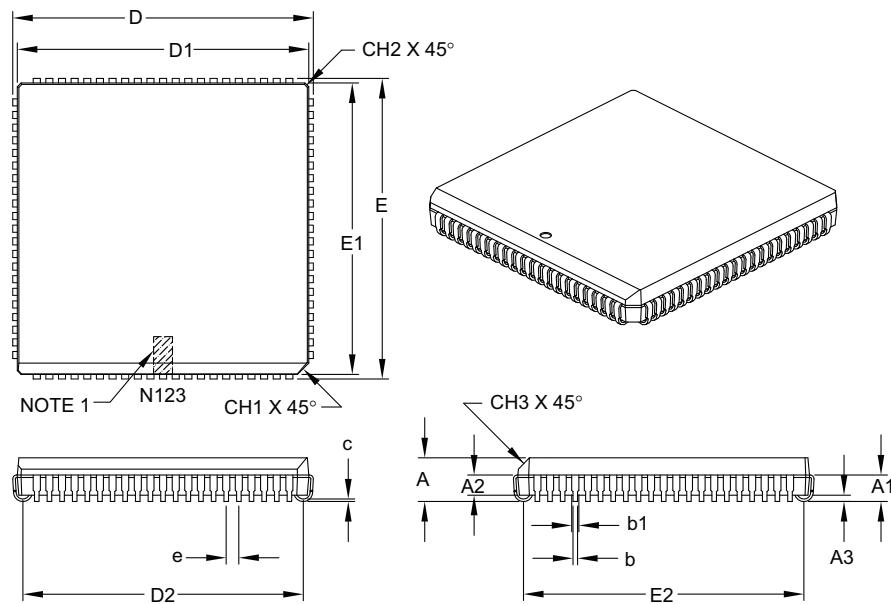
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

84-Lead Plastic Leaded Chip Carrier (L) – Square [PLCC]

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



		Units	INCHES		
Dimension Limits			MIN	NOM	MAX
Number of Pins	N			84	
Pitch	e			.050	
Overall Height	A	.165	.172	.200	
Contact Height	A1	.090	.105	.130	
Molded Package to Contact	A2	.059	—	.080	
Standoff §	A3	.020	—	—	
Corner Chamfer	CH1	.042	—	.048	
Chamfers	CH2	—	—	.020	
Side Chamfer	CH3	.042	—	.056	
Overall Width	E	1.185	1.190	1.195	
Overall Length	D	1.185	1.190	1.195	
Molded Package Width	E1	1.150	1.154	1.158	
Molded Package Length	D1	1.150	1.154	1.158	
Footprint Width	E2	1.082	1.110	1.138	
Footprint Length	D2	1.082	1.110	1.138	
Lead Thickness	c	.0075	—	.0125	
Upper Lead Width	b1	.026	—	.032	
Lower Lead Width	b	.013	—	.021	

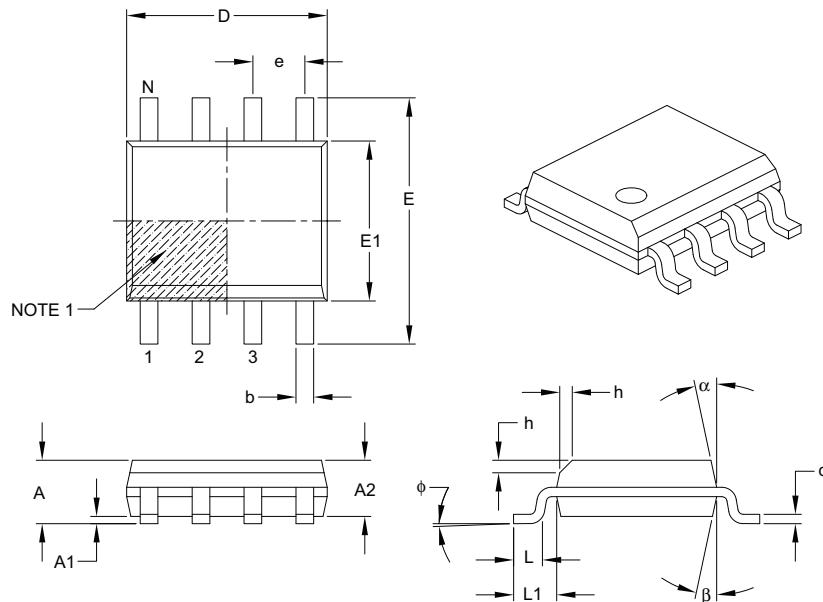
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

Packaging Diagrams and Parameters

8-Lead Plastic Small Outline (SN) – Narrow, 3.90 mm Body [SOIC]

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 Pins	N		8		
Pitch	e		1.27	BSC	
Overall Height	A		—	—	1.75
Molded Package Thickness	A2		1.25	—	—
Standoff §	A1		0.10	—	0.25
Overall Width	E		6.00	BSC	
Molded Package Width	E1		3.90	BSC	
Overall Length	D		4.90	BSC	
Chamfer (optional)	h		0.25	—	0.50
Foot Length	L		0.40	—	1.27
Footprint	L1		1.04 REF		
Foot Angle	phi		0°	—	8°
Lead Thickness	c		0.17	—	0.25
Lead Width	b		0.31	—	0.51
Mold Draft Angle Top	alpha		5°	—	15°
Mold Draft Angle Bottom	beta		5°	—	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

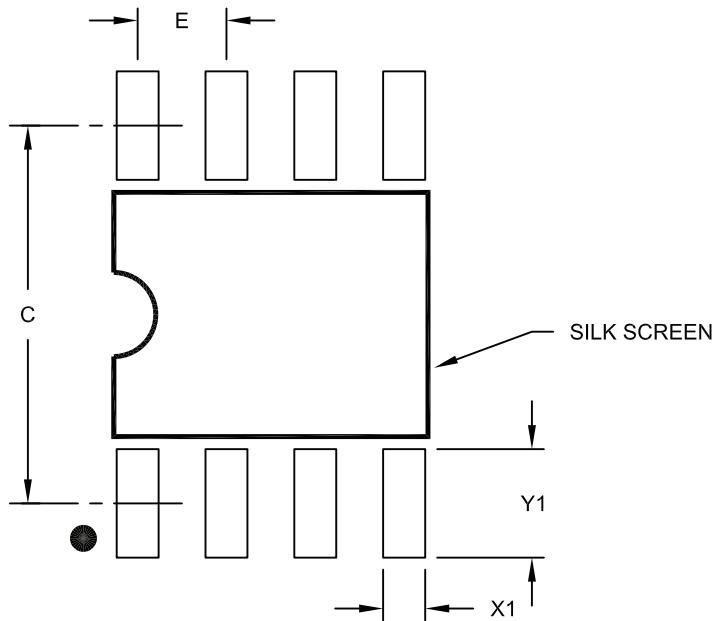
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

8-Lead Plastic Small Outline (SN) – Narrow, 3.90 mm Body [SOIC]

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		1.27	BSC	
Contact Pad Spacing	C		5.40		
Contact Pad Width (X8)	X1			0.60	
Contact Pad Length (X8)	Y1				1.55

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

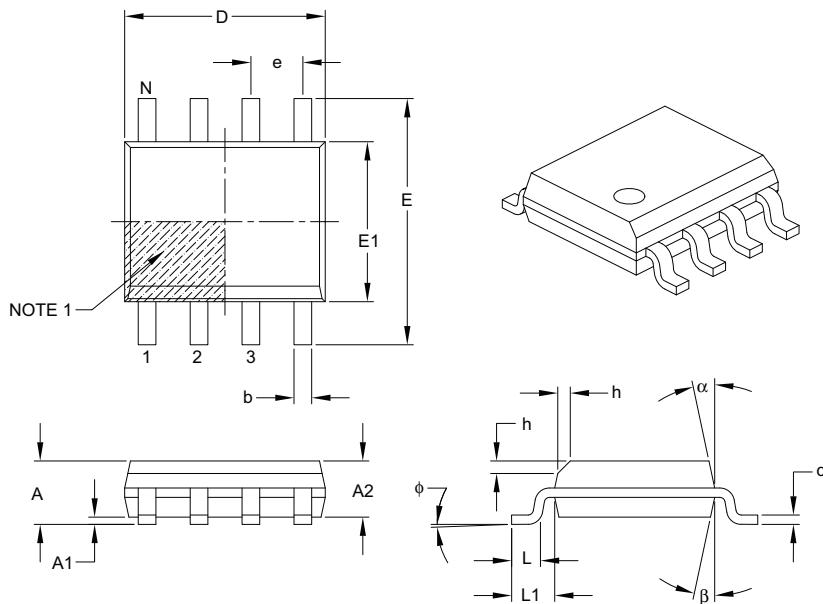
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

Packaging Diagrams and Parameters

8-Lead Plastic Small Outline (OA) – Narrow, 3.90 mm Body [SOIC]

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 Pins	N		8		
Pitch	e		1.27 BSC		
Overall Height	A		—	—	1.75
Molded Package Thickness	A2		1.25	—	—
Standoff §	A1		0.10	—	0.25
Overall Width	E		6.00 BSC		
Molded Package Width	E1		3.90 BSC		
Overall Length	D		4.90 BSC		
Chamfer (optional)	h		0.25	—	0.50
Foot Length	L		0.40	—	1.27
Footprint	L1		1.04 REF		
Foot Angle	phi		0°	—	8°
Lead Thickness	c		0.17	—	0.25
Lead Width	b		0.31	—	0.51
Mold Draft Angle Top	alpha		5°	—	15°
Mold Draft Angle Bottom	beta		5°	—	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

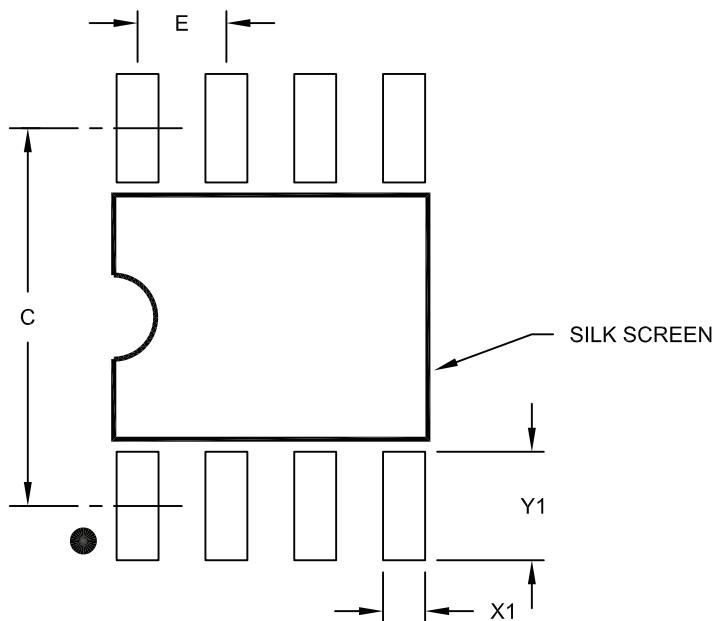
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

8-Lead Plastic Small Outline (OA) – Narrow, 3.90 mm Body [SOIC]

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		1.27	BSC	
Contact Pad Spacing	C		5.40		
Contact Pad Width (X8)	X1			0.60	
Contact Pad Length (X8)	Y1				1.55

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

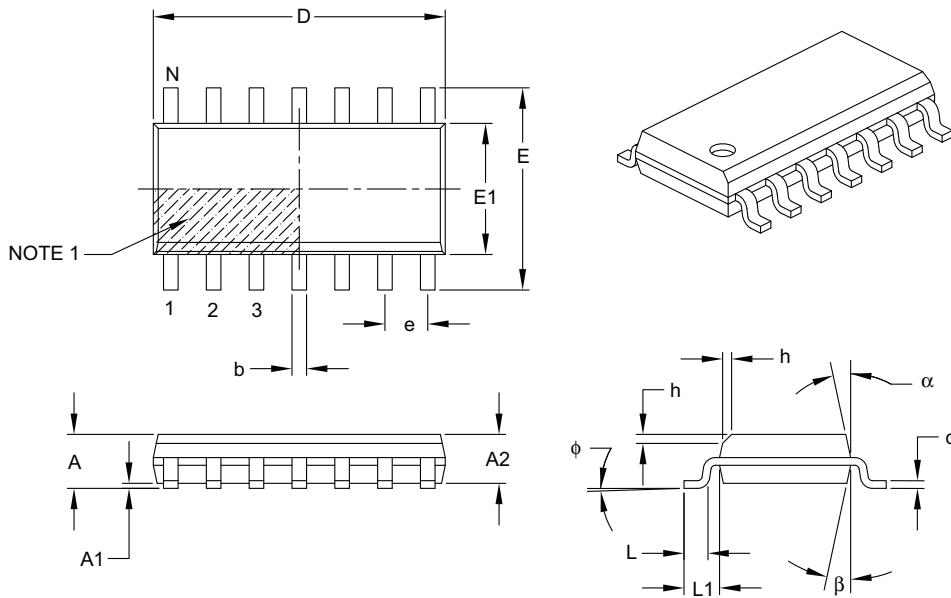
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

Packaging Diagrams and Parameters

14-Lead Plastic Small Outline (SL) – Narrow, 3.90 mm Body [SOIC]

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 Pins	N			14	
Pitch	e			1.27 BSC	
Overall Height	A		–	–	1.75
Molded Package Thickness	A2		1.25	–	–
Standoff §	A1		0.10	–	0.25
Overall Width	E		6.00 BSC		
Molded Package Width	E1		3.90 BSC		
Overall Length	D		8.65 BSC		
Chamfer (optional)	h		0.25	–	0.50
Foot Length	L		0.40	–	1.27
Footprint	L1		1.04 REF		
Foot Angle	ϕ		0°	–	8°
Lead Thickness	c		0.17	–	0.25
Lead Width	b		0.31	–	0.51
Mold Draft Angle Top	α		5°	–	15°
Mold Draft Angle Bottom	β		5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

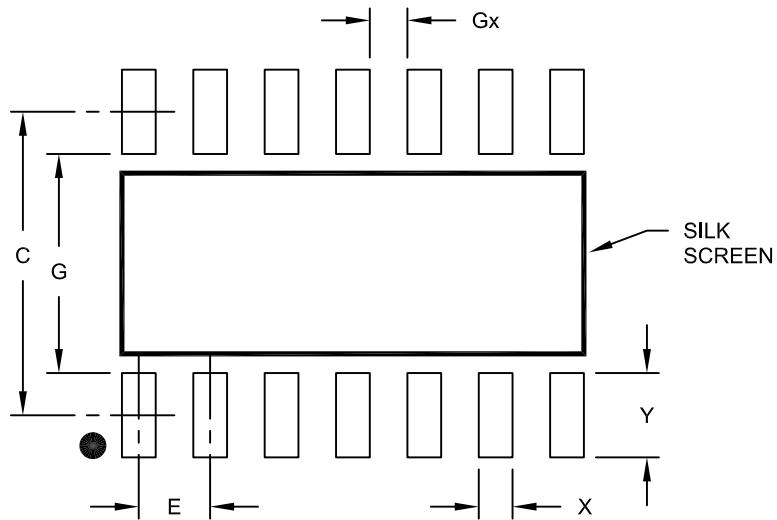
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

14-Lead Plastic Small Outline (SL) – Narrow, 3.90 mm Body [SOIC] Land Pattern

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		1.27 BSC		
Contact Pad Spacing		5.40		
Contact Pad Width		0.60		
Contact Pad Length		1.50		
Distance Between Pads		Gx	0.67	
Distance Between Pads		G	3.90	

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

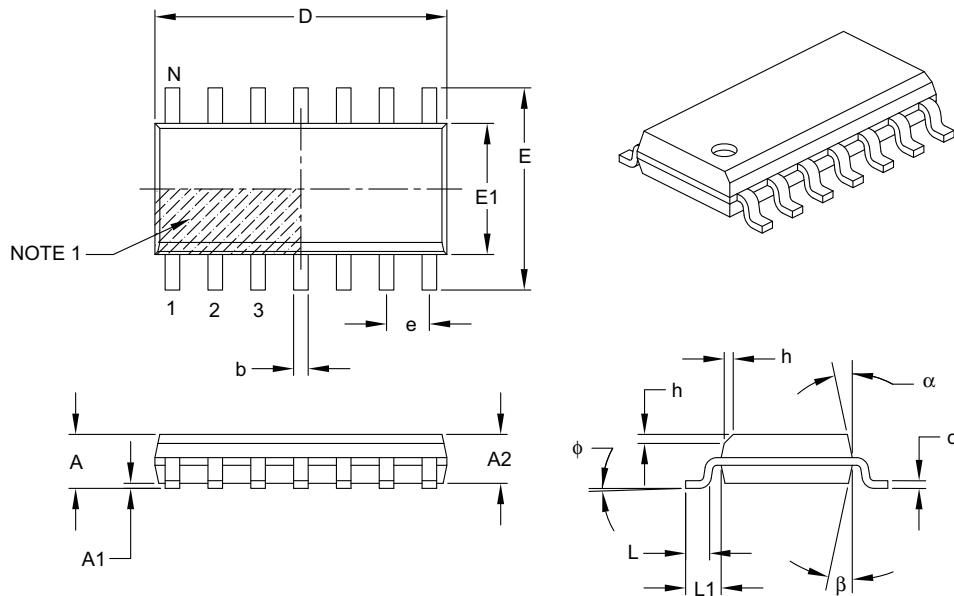
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2065A

Packaging Diagrams and Parameters

14-Lead Plastic Small Outline (OD) – Narrow, 3.90 mm Body [SOIC]

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 Pins	N		14		
Pitch	e		1.27 BSC		
Overall Height	A	—	—	1.75	
Molded Package Thickness	A2	1.25	—	—	
Standoff §	A1	0.10	—	0.25	
Overall Width	E	6.00 BSC			
Molded Package Width	E1	3.90 BSC			
Overall Length	D	8.65 BSC			
Chamfer (optional)	h	0.25	—	0.50	
Foot Length	L	0.40	—	1.27	
Footprint	L1	1.04 REF			
Foot Angle	phi	0°	—	8°	
Lead Thickness	c	0.17	—	0.25	
Lead Width	b	0.31	—	0.51	
Mold Draft Angle Top	alpha	5°	—	15°	
Mold Draft Angle Bottom	beta	5°	—	15°	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

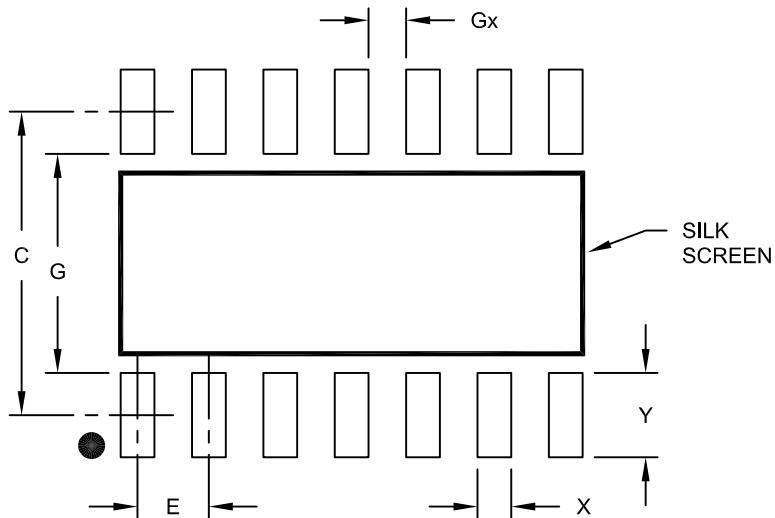
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

14-Lead Plastic Small Outline (OD) – Narrow, 3.90 mm Body [SOIC] Land Pattern

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	1.27	BSC	
Contact Pad Spacing	C		5.40	
Contact Pad Width	X			0.60
Contact Pad Length	Y			1.50
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	3.90		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

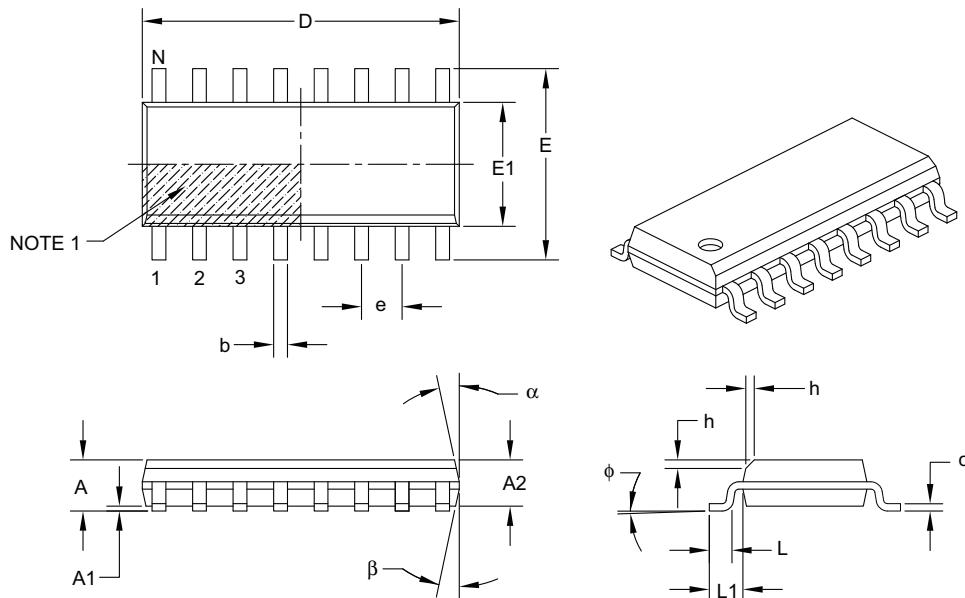
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2065A

Packaging Diagrams and Parameters

16-Lead Plastic Small Outline (SL) – Narrow, 3.90 mm Body [SOIC]

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 Pins	N		16		
Pitch	e		1.27 BSC		
Overall Height	A	—	—	1.75	
Molded Package Thickness	A2	1.25	—	—	
Standoff §	A1	0.10	—	0.25	
Overall Width	E	6.00 BSC			
Molded Package Width	E1	3.90 BSC			
Overall Length	D	9.90 BSC			
Chamfer (optional)	h	0.25	—	0.50	
Foot Length	L	0.40	—	1.27	
Footprint	L1	1.04 REF			
Foot Angle	ϕ	0°	—	8°	
Lead Thickness	c	0.17	—	0.25	
Lead Width	b	0.31	—	0.51	
Mold Draft Angle Top	α	5°	—	15°	
Mold Draft Angle Bottom	β	5°	—	15°	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

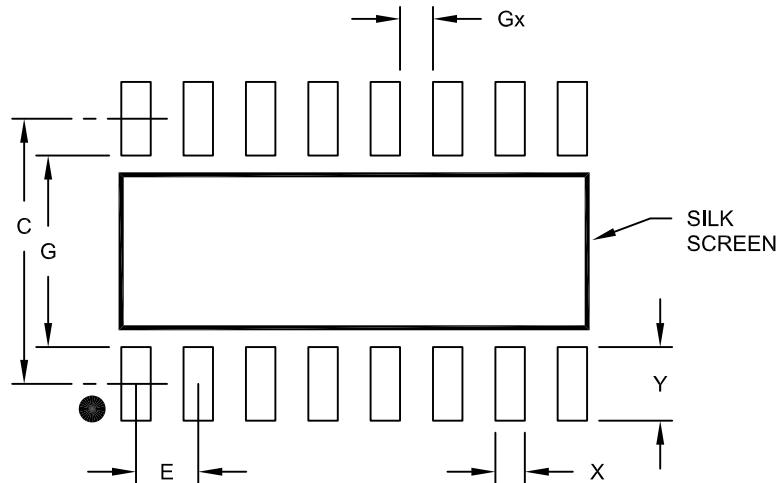
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

16-Lead Plastic Small Outline (SL) – Narrow 3.90 mm Body [SOIC] Land Pattern

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		1.27	BSC	
Contact Pad Spacing	C		5.40		
Contact Pad Width	X			0.60	
Contact Pad Length	Y			1.50	
Distance Between Pads	Gx	0.67			
Distance Between Pads	G	3.90			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

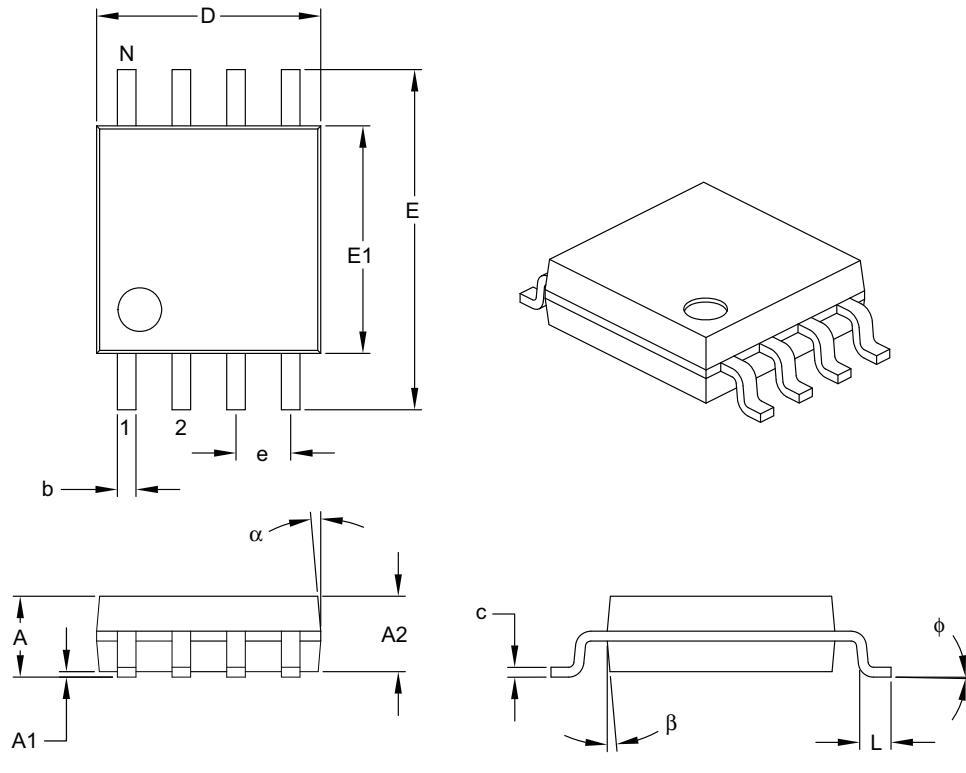
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2108A

Packaging Diagrams and Parameters

8-Lead Plastic Small Outline (SM) – Medium, 5.28 mm Body [SOIJ]

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 Pins	N	8		
Pitch	e	1.27 BSC		
Overall Height	A	1.77	–	2.03
Molded Package Thickness	A2	1.75	–	1.98
Standoff §	A1	0.05	–	0.25
Overall Width	E	7.62	–	8.26
Molded Package Width	E1	5.11	–	5.38
Overall Length	D	5.13	–	5.33
Foot Length	L	0.51	–	0.76
Foot Angle	ϕ	0°	–	8°
Lead Thickness	c	0.15	–	0.25
Lead Width	b	0.36	–	0.51
Mold Draft Angle Top	α	–	–	15°
Mold Draft Angle Bottom	β	–	–	15°

Notes:

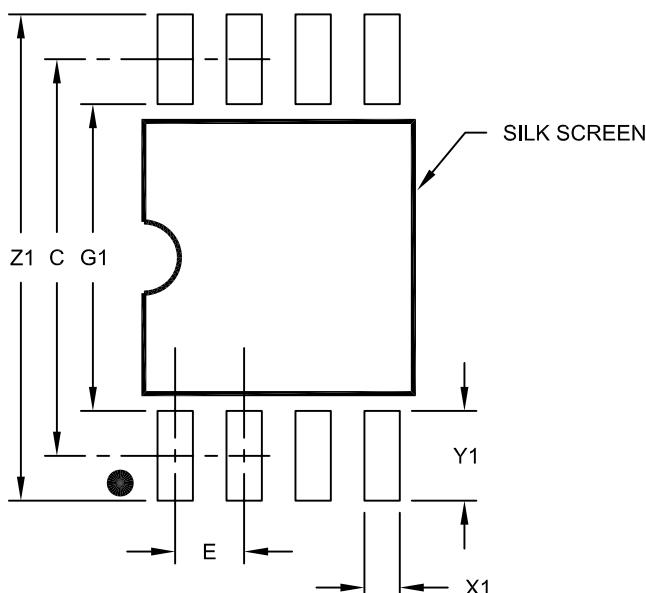
1. SOIJ, JEITA/EIAJ Standard, formerly called SOIC.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.

Microchip Technology Drawing C04-056B

Land Pattern (Footprint)

8-Lead Plastic Small Outline (SM) - Medium, 5.28 mm Body [SOIJ]

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		1.27 BSC		
Overall Width	Z1				9.00
Contact Pad Spacing	C1			7.30	
Contact Pad Width (X28)	X1				0.65
Contact Pad Length (X28)	Y1				1.70
Distance Between Pads	G1	5.60			
Distance Between Pads	G	0.62			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

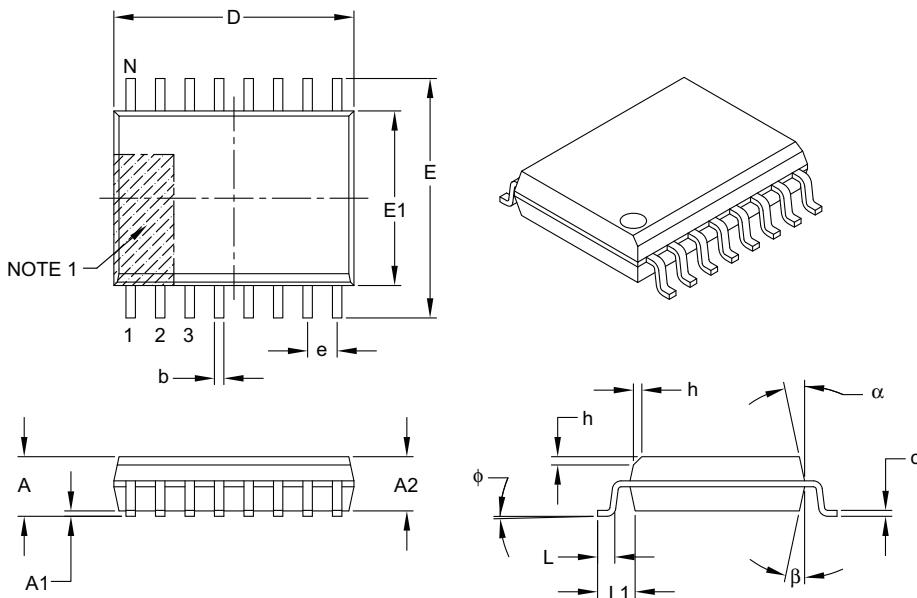
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2056B

Packaging Diagrams and Parameters

16-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

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 Pins	N		16		
Pitch	e		1.27	BSC	
Overall Height	A	—	—	2.65	
Molded Package Thickness	A2	2.05	—	—	
Standoff §	A1	0.10	—	0.30	
Overall Width	E	10.30	BSC		
Molded Package Width	E1		7.50	BSC	
Overall Length	D	10.30	BSC		
Chamfer (optional)	h	0.25	—	0.75	
Foot Length	L	0.40	—	1.27	
Footprint	L1	1.40 REF			
Foot Angle	phi	0°	—	8°	
Lead Thickness	c	0.20	—	0.33	
Lead Width	b	0.31	—	0.51	
Mold Draft Angle Top	alpha	5°	—	15°	
Mold Draft Angle Bottom	beta	5°	—	15°	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

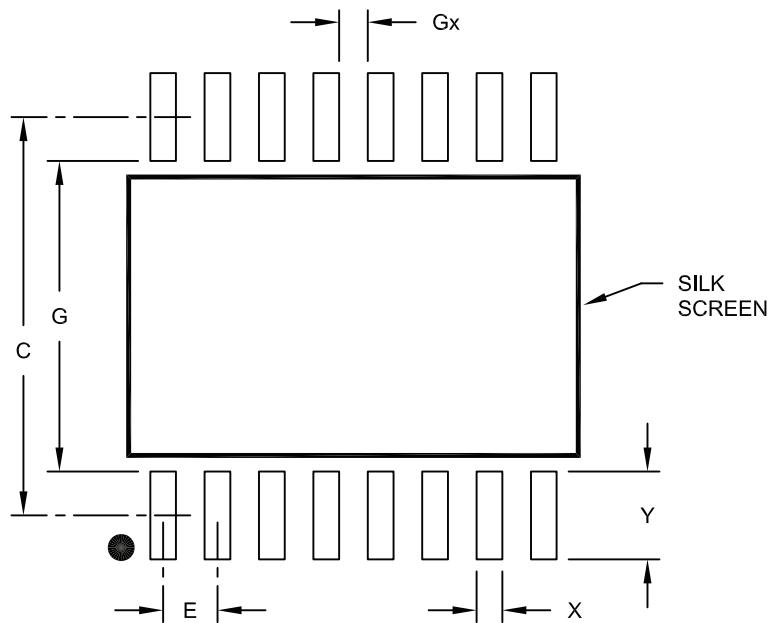
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

16-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC] Land Pattern

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		1.27 BSC	
Contact Pad Spacing	C		9.30	
Contact Pad Width	X			0.60
Contact Pad Length	Y			2.05
Distance Between Pads	Gx	0.67		
Distance Between Pads	G	7.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

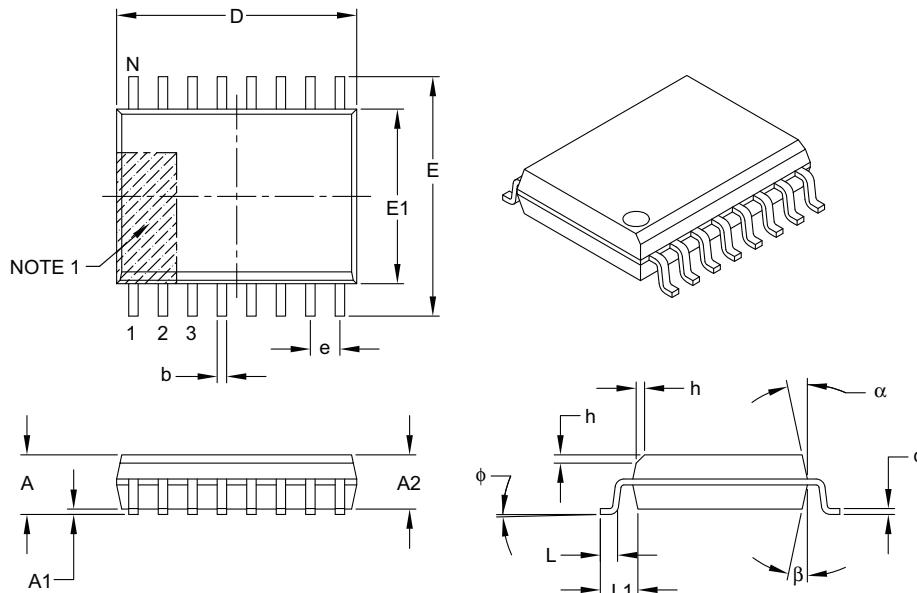
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2102A

Packaging Diagrams and Parameters

16-Lead Plastic Small Outline (OE) – Wide, 7.50 mm Body [SOIC]

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 Pins		N	16		
Pitch		e	1.27 BSC		
Overall Height		A	–	–	2.65
Molded Package Thickness		A2	2.05	–	–
Standoff §		A1	0.10	–	0.30
Overall Width		E	10.30 BSC		
Molded Package Width		E1	7.50 BSC		
Overall Length		D	10.30 BSC		
Chamfer (optional)		h	0.25	–	0.75
Foot Length		L	0.40	–	1.27
Footprint		L1	1.40 REF		
Foot Angle		phi	0°	–	8°
Lead Thickness		c	0.20	–	0.33
Lead Width		b	0.31	–	0.51
Mold Draft Angle Top		alpha	5°	–	15°
Mold Draft Angle Bottom		beta	5°	–	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

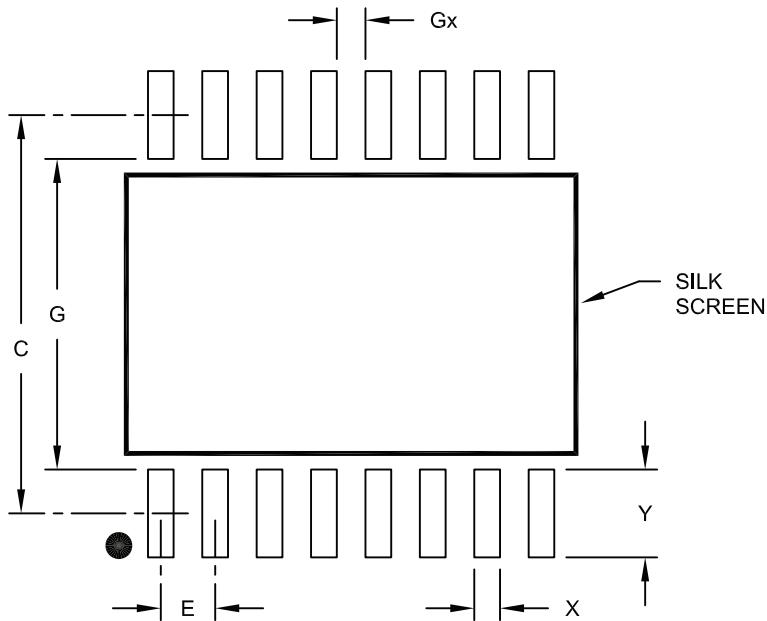
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

16-Lead Plastic Small Outline (OE) – Wide, 7.50 mm Body [SOIC] Land Pattern

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				1.27	BSC	
Contact Pad Spacing	C				9.30		
Contact Pad Width	X				0.60		
Contact Pad Length	Y				2.05		
Distance Between Pads	Gx	0.67					
Distance Between Pads	G	7.25					

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

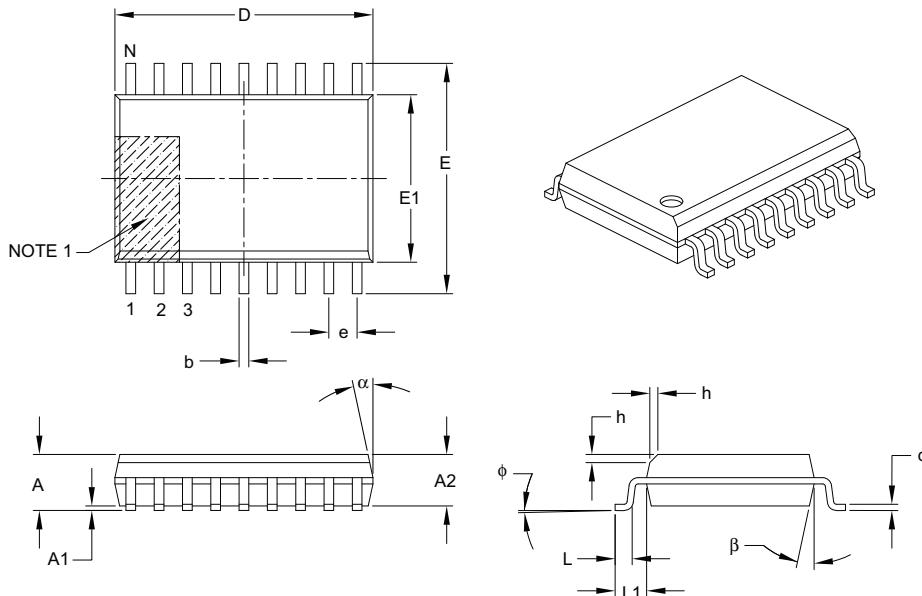
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2102A

Packaging Diagrams and Parameters

18-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

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 Pins	N		18		
Pitch	e		1.27 BSC		
Overall Height	A	—	—	2.65	
Molded Package Thickness	A2	2.05	—	—	
Standoff §	A1	0.10	—	0.30	
Overall Width	E	10.30 BSC			
Molded Package Width	E1	7.50 BSC			
Overall Length	D	11.55 BSC			
Chamfer (optional)	h	0.25	—	0.75	
Foot Length	L	0.40	—	1.27	
Footprint	L1	1.40 REF			
Foot Angle	phi	0°	—	8°	
Lead Thickness	c	0.20	—	0.33	
Lead Width	b	0.31	—	0.51	
Mold Draft Angle Top	alpha	5°	—	15°	
Mold Draft Angle Bottom	beta	5°	—	15°	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

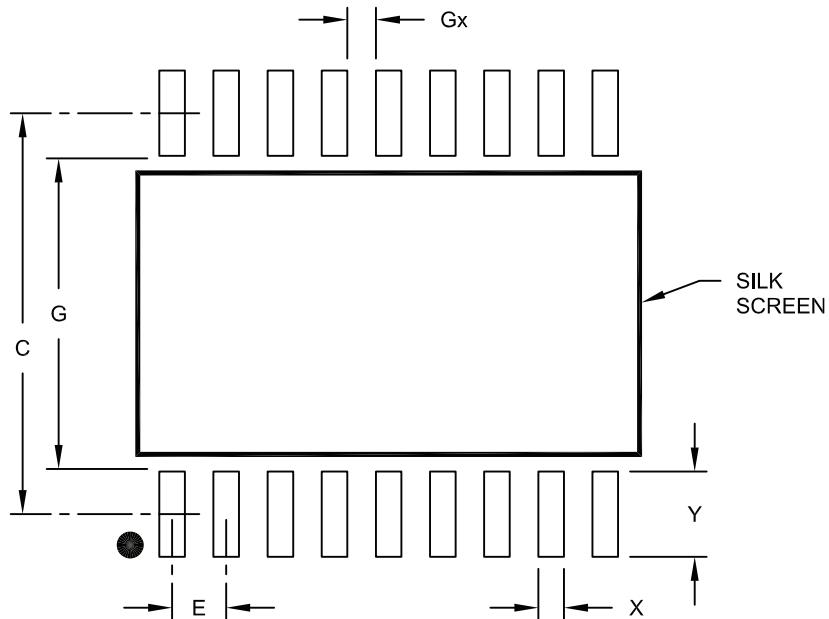
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

18-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC] Land Pattern

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		1.27	BSC	
Contact Pad Spacing	C		9.40		
Contact Pad Width	X			0.60	
Contact Pad Length	Y			2.00	
Distance Between Pads	Gx	0.67			
Distance Between Pads	G	7.40			

Notes:

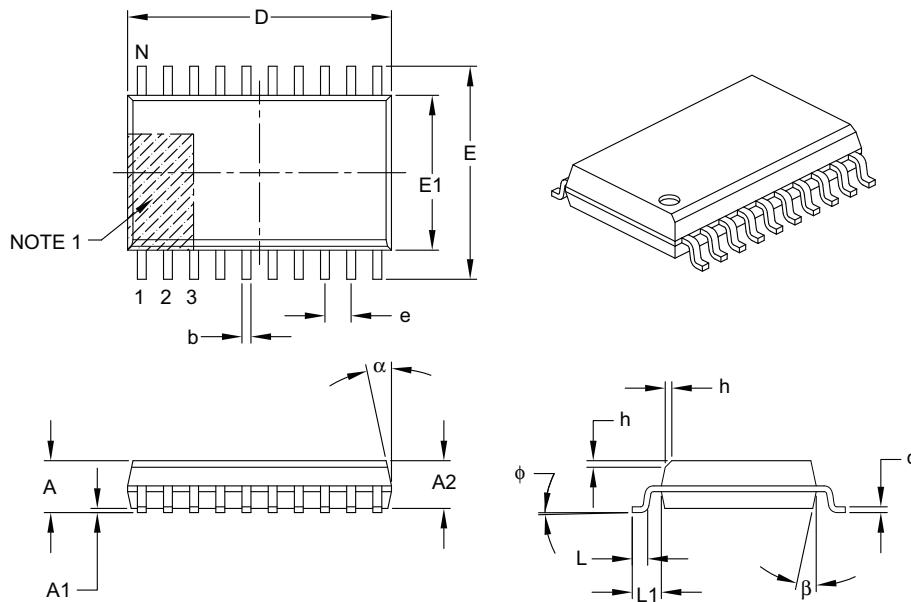
1. Dimensioning and tolerancing per ASME Y14.5M

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

Packaging Diagrams and Parameters

20-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

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 Pins	N		20		
Pitch	e		1.27 BSC		
Overall Height	A	—	—	2.65	
Molded Package Thickness	A2	2.05	—	—	
Standoff §	A1	0.10	—	0.30	
Overall Width	E	10.30 BSC			
Molded Package Width	E1	7.50 BSC			
Overall Length	D	12.80 BSC			
Chamfer (optional)	h	0.25	—	0.75	
Foot Length	L	0.40	—	1.27	
Footprint	L1	1.40 REF			
Foot Angle	ϕ	0°	—	8°	
Lead Thickness	c	0.20	—	0.33	
Lead Width	b	0.31	—	0.51	
Mold Draft Angle Top	α	5°	—	15°	
Mold Draft Angle Bottom	β	5°	—	15°	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

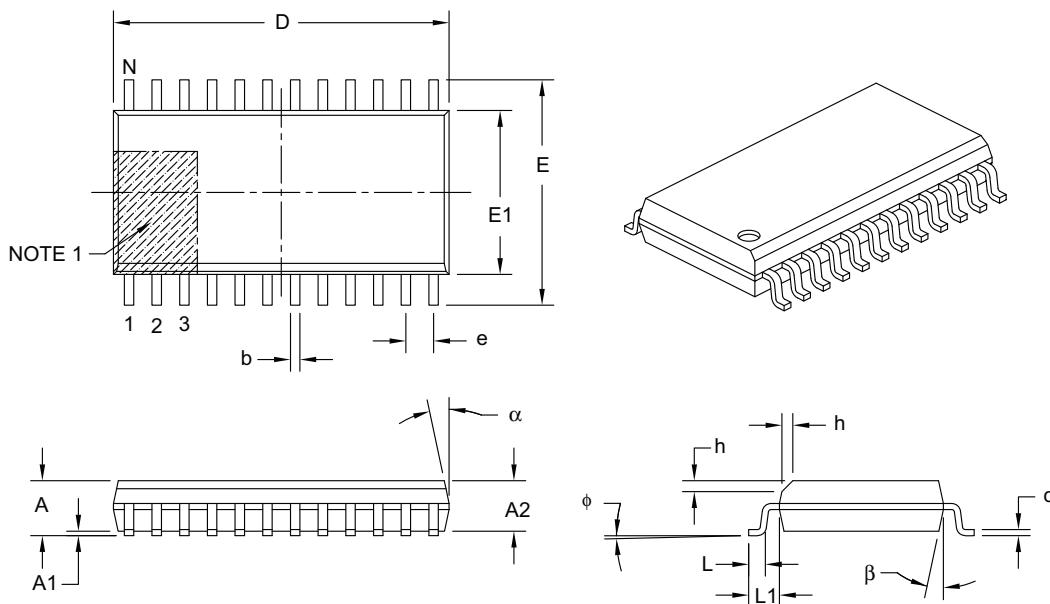
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-094B

Packaging Diagrams and Parameters

24-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

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



Dimension Limits	Units MILLIMETERS		
	MIN	NOM	MAX
Number of Pins	N	24	
Pitch	e	1.27 BSC	
Overall Height	A	—	2.65
Molded Package Thickness	A2	2.05	—
Standoff §	A1	0.10	0.30
Overall Width	E	10.30 BSC	
Molded Package Width	E1	7.50 BSC	
Overall Length	D	15.40 BSC	
Chamfer (optional)	h	0.25	0.75
Foot Length	L	0.40	1.27
Footprint	L1	1.40 REF	
Foot Angle	phi	0°	8°
Lead Thickness	c	0.20	0.33
Lead Width	b	0.31	0.51
Mold Draft Angle Top	alpha	5°	15°
Mold Draft Angle Bottom	beta	5°	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

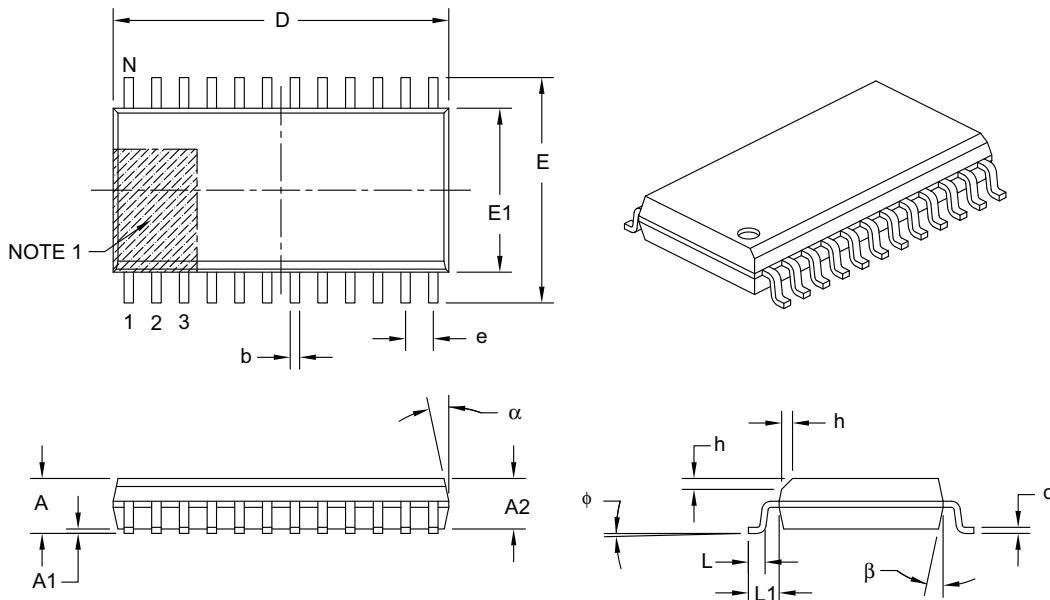
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

24-Lead Plastic Small Outline (OG) – Wide, 7.50 mm Body [SOIC]

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 Pins	N		24		
Pitch	e		1.27	BSC	
Overall Height	A	—	—	2.65	
Molded Package Thickness	A2	2.05	—	—	
Standoff §	A1	0.10	—	0.30	
Overall Width	E	10.30	BSC		
Molded Package Width	E1	7.50	BSC		
Overall Length	D	15.40	BSC		
Chamfer (optional)	h	0.25	—	0.75	
Foot Length	L	0.40	—	1.27	
Footprint	L1	1.40 REF			
Foot Angle	ϕ	0°	—	8°	
Lead Thickness	c	0.20	—	0.33	
Lead Width	b	0.31	—	0.51	
Mold Draft Angle Top	α	5°	—	15°	
Mold Draft Angle Bottom	β	5°	—	15°	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

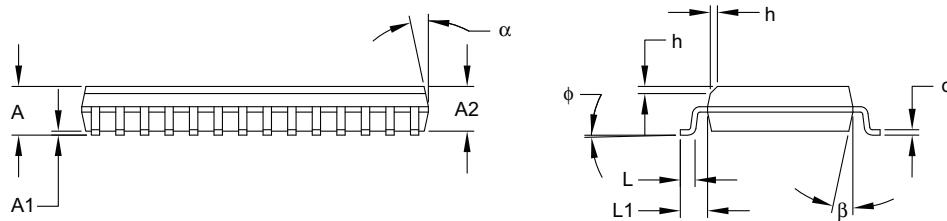
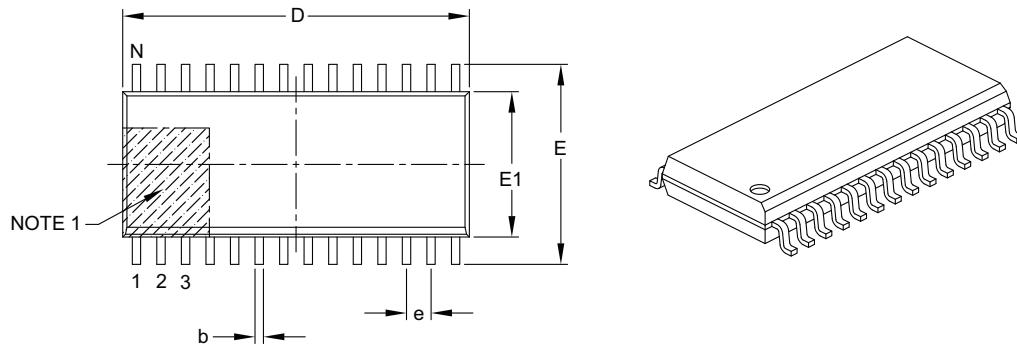
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

28-Lead Plastic Small Outline (SO) – Wide, 7.50 mm Body [SOIC]

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 Pins		N		
Pitch		e		
Overall Height		A		
Molded Package Thickness		A2		
Standoff §		A1		
Overall Width		E		
Molded Package Width		E1		
Overall Length		D		
Chamfer (optional)		h		
Foot Length		L		
Footprint		L1		
Foot Angle Top		ϕ		
Lead Thickness		c		
Lead Width		b		
Mold Draft Angle Top		α		
Mold Draft Angle Bottom		β		

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

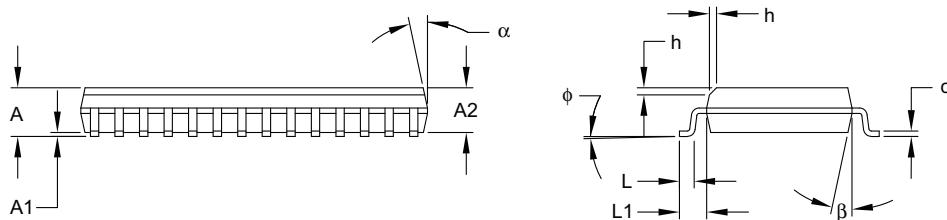
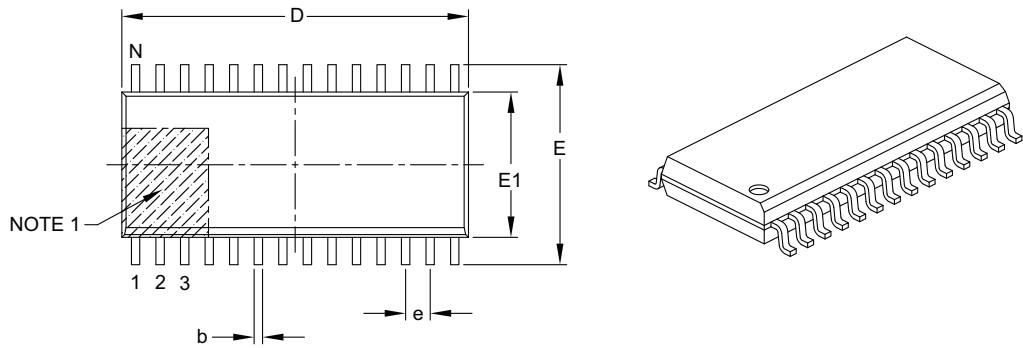
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-052B

Packaging Diagrams and Parameters

28-Lead Plastic Small Outline (OI) – Wide, 7.50 mm Body [SOIC]

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



Dimension Limits		MILLIMETERS		
		MIN	NOM	MAX
Number of Pins	N	28		
Pitch	e	1.27 BSC		
Overall Height	A	—	—	2.65
Molded Package Thickness	A2	2.05	—	—
Standoff §	A1	0.10	—	0.30
Overall Width	E	10.30 BSC		
Molded Package Width	E1	7.50 BSC		
Overall Length	D	17.90 BSC		
Chamfer (optional)	h	0.25	—	0.75
Foot Length	L	0.40	—	1.27
Footprint	L1	1.40 REF		
Foot Angle Top	ϕ	0°	—	8°
Lead Thickness	c	0.18	—	0.33
Lead Width	b	0.31	—	0.51
Mold Draft Angle Top	α	5°	—	15°
Mold Draft Angle Bottom	β	5°	—	15°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

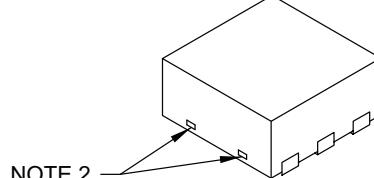
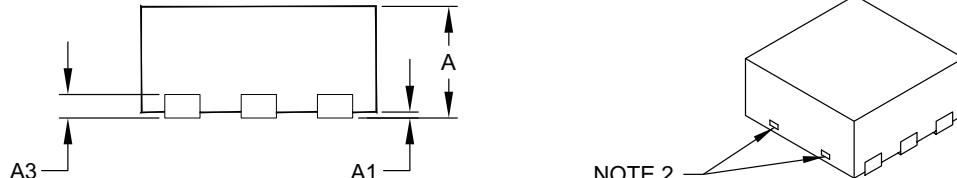
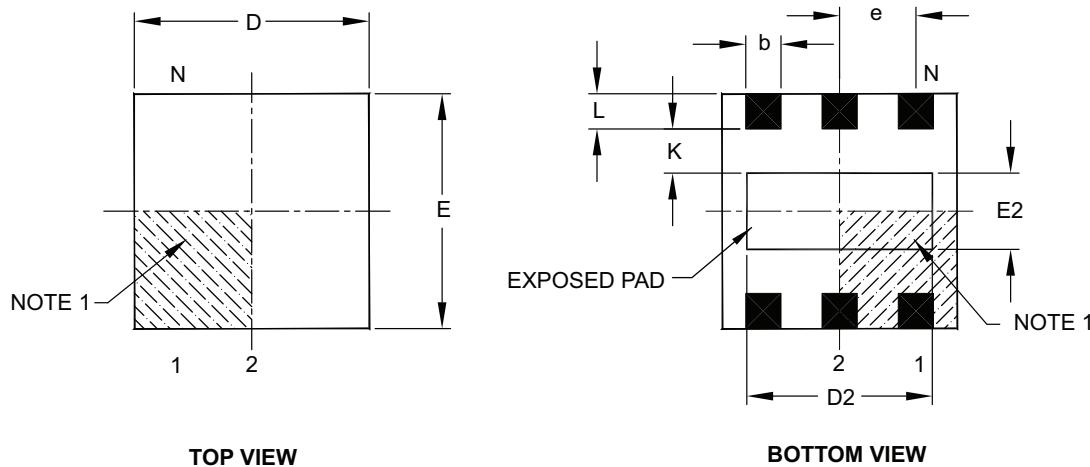
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-052B

Packaging Diagrams and Parameters

6-Lead Plastic Dual Flat, No Lead Package (MA) – 2x2x0.9 mm Body [DFN]

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 Pins	N			6	
Pitch	e			0.65 BSC	
Overall Height	A	0.80	0.90	1.00	
Standoff	A1	0.00	0.02	0.05	
Contact Thickness	A3		0.20	REF	
Overall Length	D		2.00	BSC	
Overall Width	E		2.00	BSC	
Exposed Pad Length	D2	0.00	–	1.58	
Exposed Pad Width	E2	0.00	–	0.65	
Contact Width	b	0.25	0.30	0.35	
Contact Length	L	0.20	0.30	0.45	
Contact-to-Exposed Pad	K	0.20	–	–	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

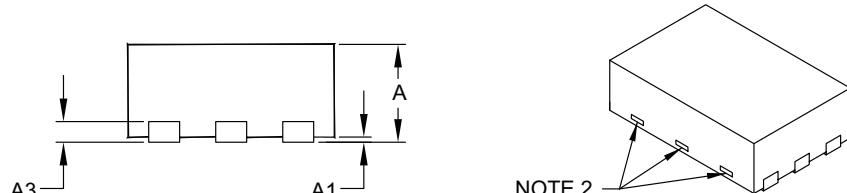
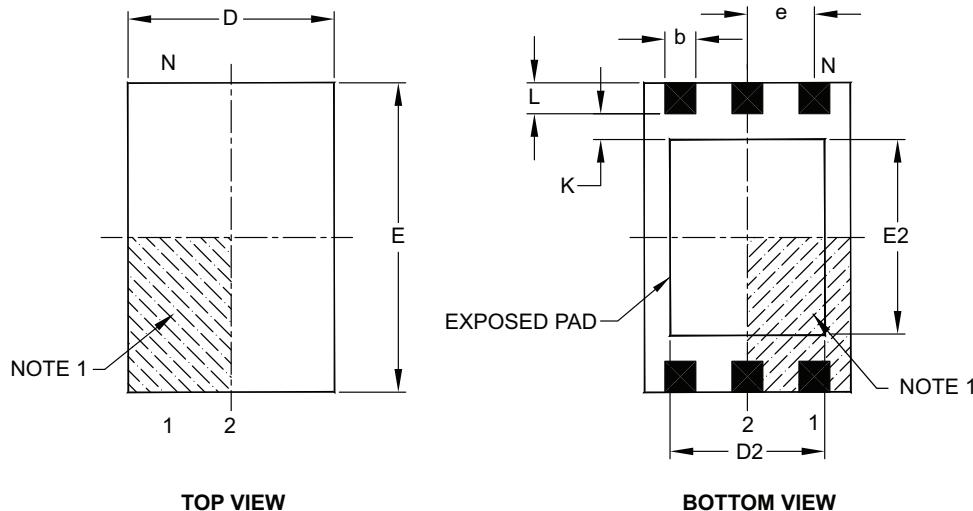
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

6-Lead Plastic Dual Flat, No Lead Package (ME) – 2x3x0.9 mm Body [DFN]

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 Pins	N		6	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Length	D		2.00 BSC	
Overall Width	E		3.00 BSC	
Exposed Pad Length	D2	1.40	–	1.60
Exposed Pad Width	E2	1.80	–	2.00
Contact Width	b	0.25	0.30	0.35
Contact Length	L	0.20	0.30	0.40
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.

2. Package may have one or more exposed tie bars at ends.

3. Package is saw singulated.

4. Dimensioning and tolerancing per ASME Y14.5M.

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

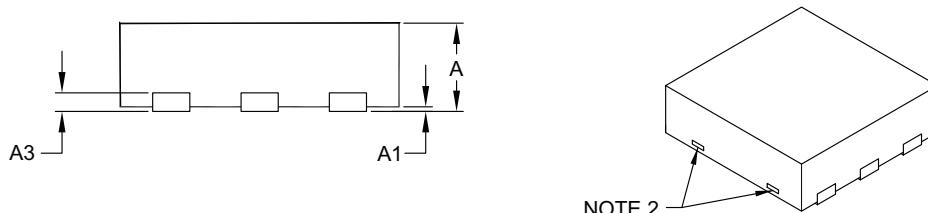
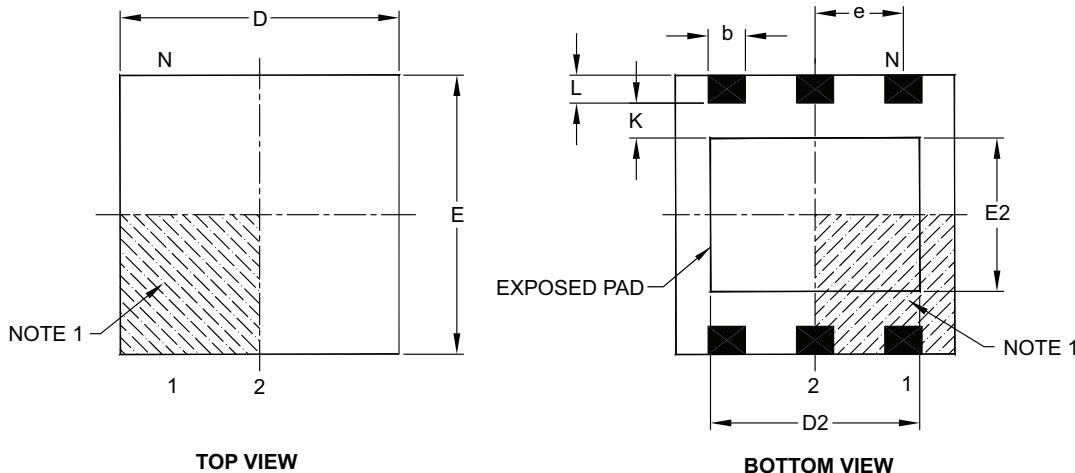
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-134A

Packaging Diagrams and Parameters

6-Lead Plastic Dual Flat, No Lead Package (MH) – 3x3x0.9 mm Body [DFN]

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 Pins		N	6		
Pitch		e	0.95 BSC		
Overall Height		A	0.80	0.90	1.00
Standoff		A1	0.00	0.02	0.05
Contact Thickness		A3	0.20 REF		
Overall Length		D	3.00 BSC		
Overall Width		E	3.00 BSC		
Exposed Pad Length		D2	0.00	–	2.25
Exposed Pad Width		E2	0.00	–	1.65
Contact Width		b	0.30	0.40	0.45
Contact Length		L	0.20	0.30	0.45
Contact-to-Exposed Pad		K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

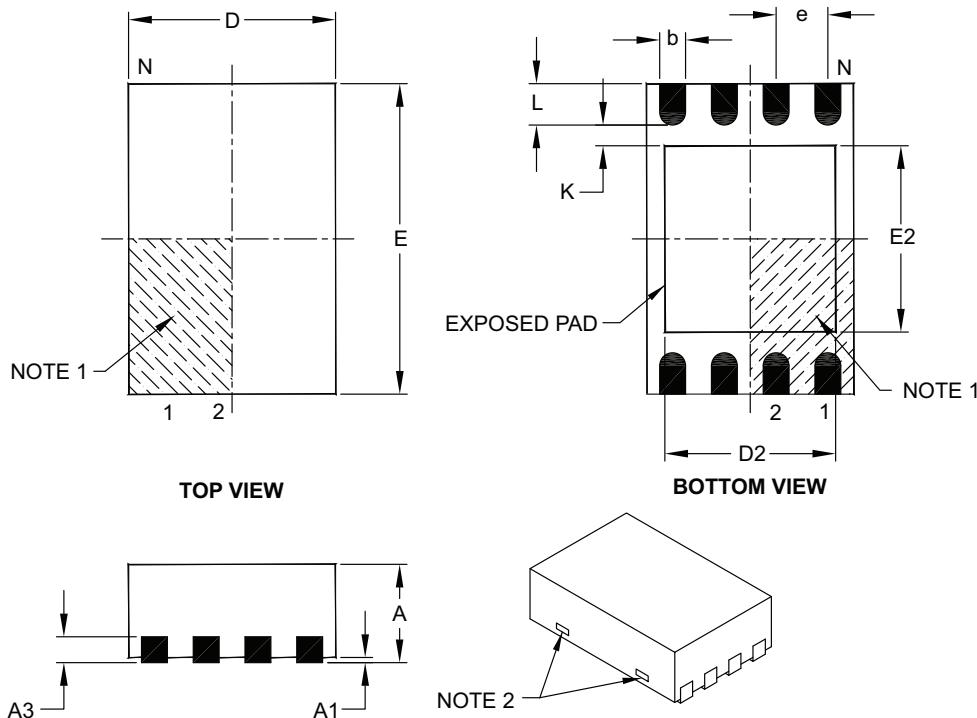
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MC) – 2x3x0.9 mm Body [DFN]

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 Pins	N				8		
Pitch	e				0.50	BSC	
Overall Height	A	0.80	0.90	1.00			
Standoff	A1	0.00	0.02	0.05			
Contact Thickness	A3	0.20 REF					
Overall Length	D	2.00 BSC					
Overall Width	E	3.00 BSC					
Exposed Pad Length	D2	1.30	–	1.55			
Exposed Pad Width	E2	1.50	–	1.75			
Contact Width	b	0.20	0.25	0.30			
Contact Length	L	0.30	0.40	0.50			
Contact-to-Exposed Pad	K	0.20	–	–			

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.

2. Package may have one or more exposed tie bars at ends.

3. Package is saw singulated.

4. Dimensioning and tolerancing per ASME Y14.5M.

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

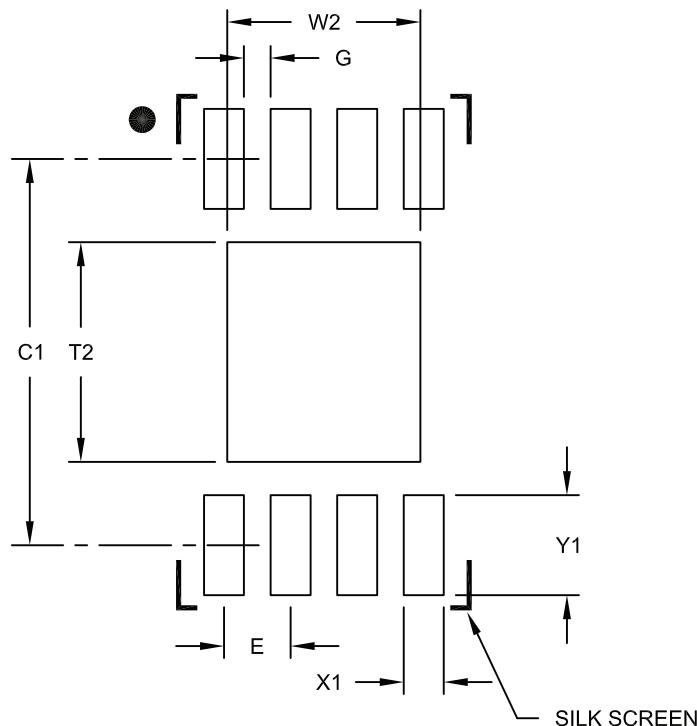
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-123C

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MC) – 2x3x0.9 mm Body [DFN]

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		0.50 BSC	
Optional Center Pad Width	W2			1.45
Optional Center Pad Length	T2			1.75
Contact Pad Spacing	C1	2.90		
Contact Pad Width (X8)	X1		0.30	
Contact Pad Length (X8)	Y1			0.75
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

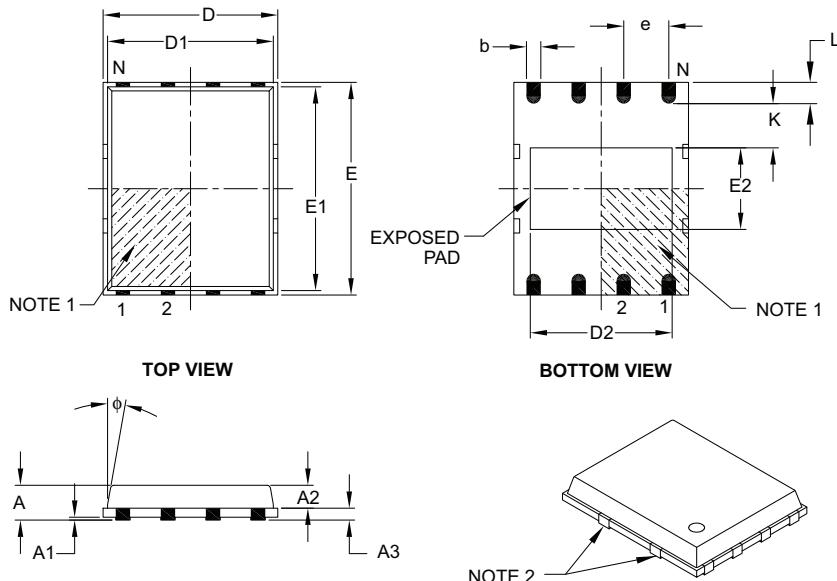
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2123A

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MF) – 6x5 mm Body [DFN-S] PUNCH SINGULATED

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 Pins	N		8		
Pitch	e		1.27 BSC		
Overall Height	A		–	0.85	1.00
Molded Package Thickness	A2		–	0.65	0.80
Standoff	A1		0.00	0.01	0.05
Base Thickness	A3		0.20 REF		
Overall Length	D		4.92 BSC		
Molded Package Length	D1		4.67 BSC		
Exposed Pad Length	D2		3.85	4.00	4.15
Overall Width	E		5.99 BSC		
Molded Package Width	E1		5.74 BSC		
Exposed Pad Width	E2		2.16	2.31	2.46
Contact Width	b		0.35	0.40	0.47
Contact Length	L		0.50	0.60	0.75
Contact-to-Exposed Pad	K		0.20	–	–
Model Draft Angle Top	ϕ		–	–	12°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
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 C04-113B

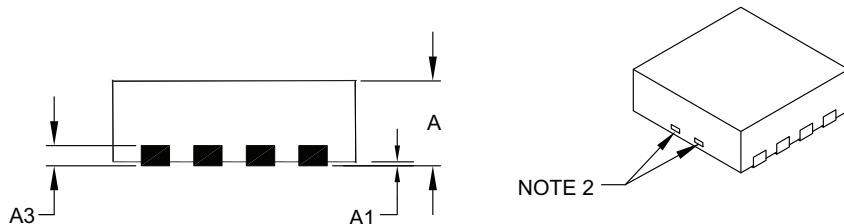
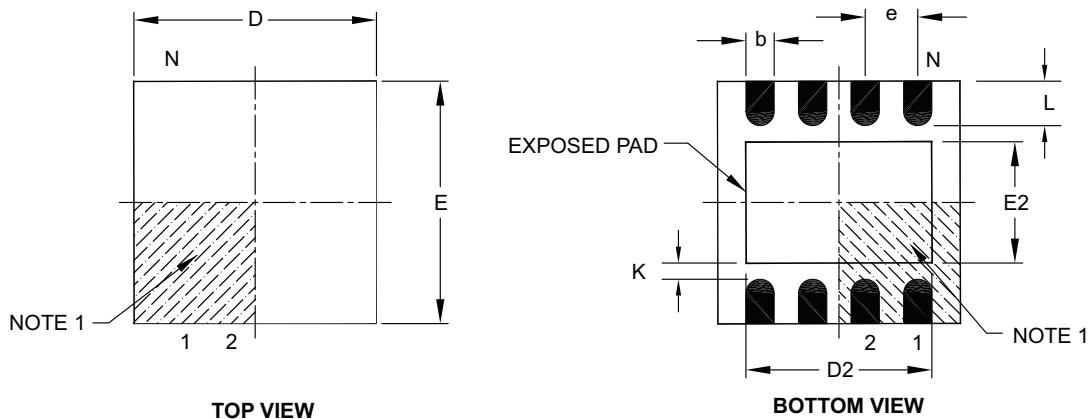
Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MF) – 3x3x0.9 mm Body [DFN]

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 Pins	N		8	
Pitch	e		0.65 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3	0.20 REF		
Overall Length	D	3.00 BSC		
Exposed Pad Width	E2	0.00	–	1.60
Overall Width	E	3.00 BSC		
Exposed Pad Length	D2	0.00	–	2.40
Contact Width	b	0.25	0.30	0.35
Contact Length	L	0.20	0.30	0.55
Contact-to-Exposed Pad	K	0.20	–	–

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.

2. Package may have one or more exposed tie bars at ends.

3. Package is saw singulated.

4. Dimensioning and tolerancing per ASME Y14.5M.

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

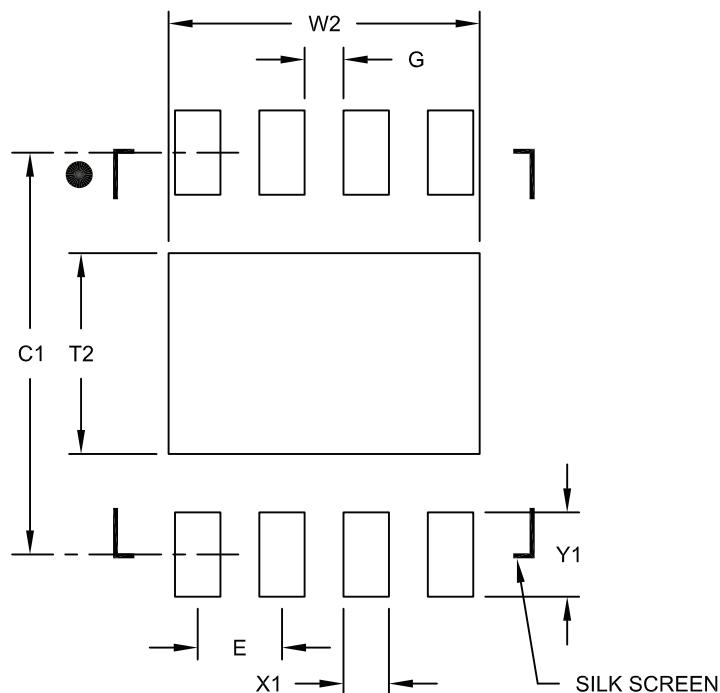
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-062B

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MF) – 3x3x0.9 mm Body [DFN]

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	0.65 BSC		
Optional Center Pad Width	W2			2.40
Optional Center Pad Length	T2			1.55
Contact Pad Spacing	C1	3.10		
Contact Pad Width (X8)	X1			0.35
Contact Pad Length (X8)	Y1			0.65
Distance Between Pads	G	0.30		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

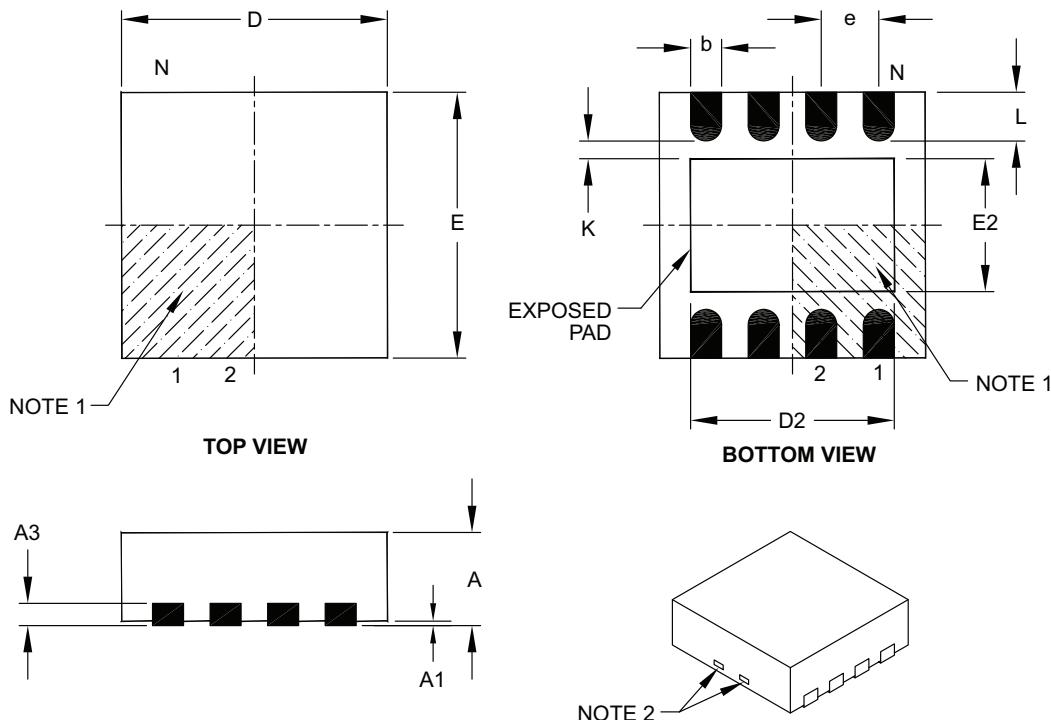
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2062A

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MD) – 4x4x0.9 mm Body [DFN]

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 Pins	N				8		
Pitch	e				0.80	BSC	
Overall Height	A	0.80	0.90	1.00			
Standoff	A1	0.00	0.02	0.05			
Contact Thickness	A3	0.20 REF					
Overall Length	D	4.00 BSC					
Exposed Pad Width	E2	0.00	2.20	2.80			
Overall Width	E	4.00 BSC					
Exposed Pad Length	D2	0.00	3.00	3.60			
Contact Width	b	0.25	0.30	0.35			
Contact Length	L	0.30	0.40	0.50			
Contact-to-Exposed Pad	K	0.20	-	-			

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

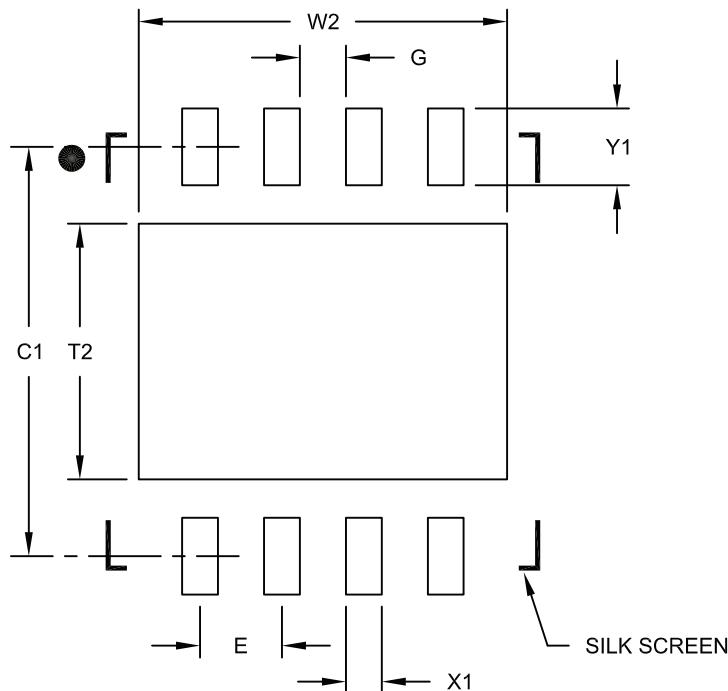
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-131D

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MD) – 4x4x0.9 mm Body [DFN]

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



RECOMMENDED LAND PATTERN

Dimension	Units	MILLIMETERS		
		MIN	NOM	MAX
Contact Pitch	E	0.80 BSC		
Optional Center Pad Width	W2			3.60
Optional Center Pad Length	T2			2.50
Contact Pad Spacing	C1	4.00		
Contact Pad Width (X8)	X1			0.35
Contact Pad Length (X8)	Y1			0.75
Distance Between Pads	G	0.45		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

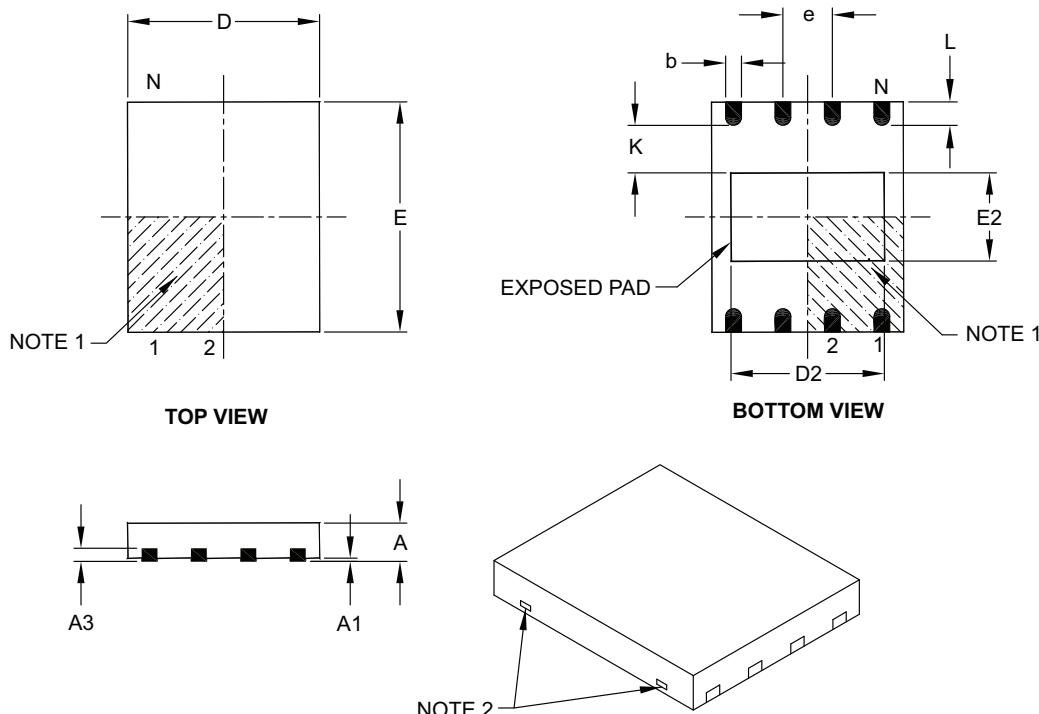
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2131B

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MF) – 6x5 mm Body [DFN-S]

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 Pins	N				8		
Pitch	e				1.27 BSC		
Overall Height	A	0.80	0.85	1.00			
Standoff	A1	0.00	0.01	0.05			
Contact Thickness	A3	0.20 REF					
Overall Length	D	5.00 BSC					
Overall Width	E	6.00 BSC					
Exposed Pad Length	D2	3.90	4.00	4.10			
Exposed Pad Width	E2	2.20	2.30	2.40			
Contact Width	b	0.35	0.40	0.48			
Contact Length	L	0.50	0.60	0.75			
Contact-to-Exposed Pad	K	0.20	–	–			

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.

2. Package may have one or more exposed tie bars at ends.

3. Package is saw singulated.

4. Dimensioning and tolerancing per ASME Y14.5M.

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

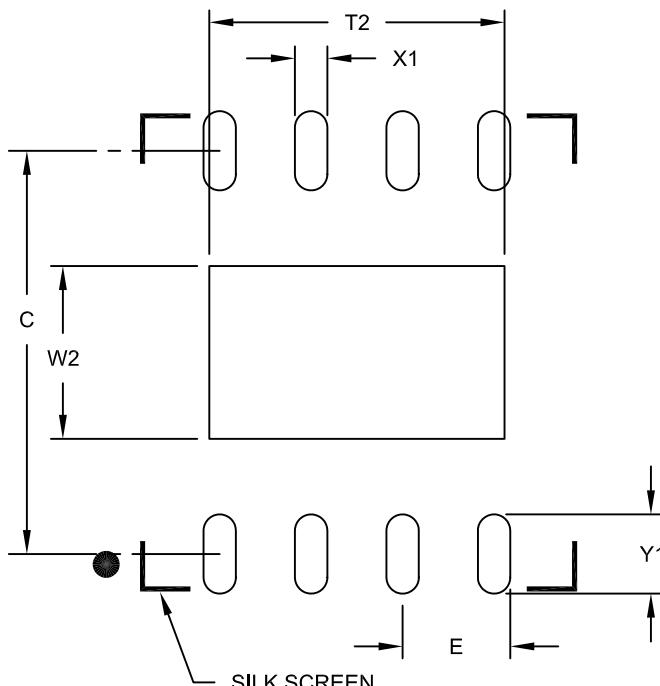
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-122B

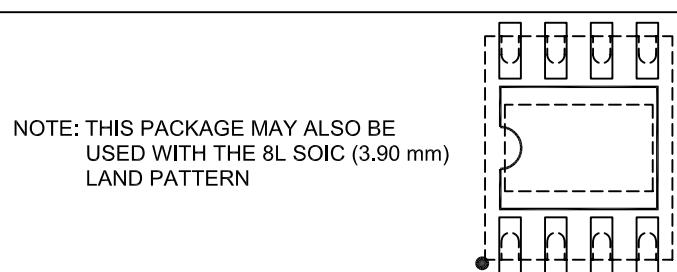
Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MF) – 6x5 mm Body [DFN-S] Land Pattern

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		1.27	BSC	
Optional Center Pad Width	W2			2.40	
Optional Center Pad Length	T2			4.10	
Contact Pad Spacing	C		5.60		
Contact Pad Width (X8)	X1			0.45	
Contact Pad Length (X8)	Y1			1.10	

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

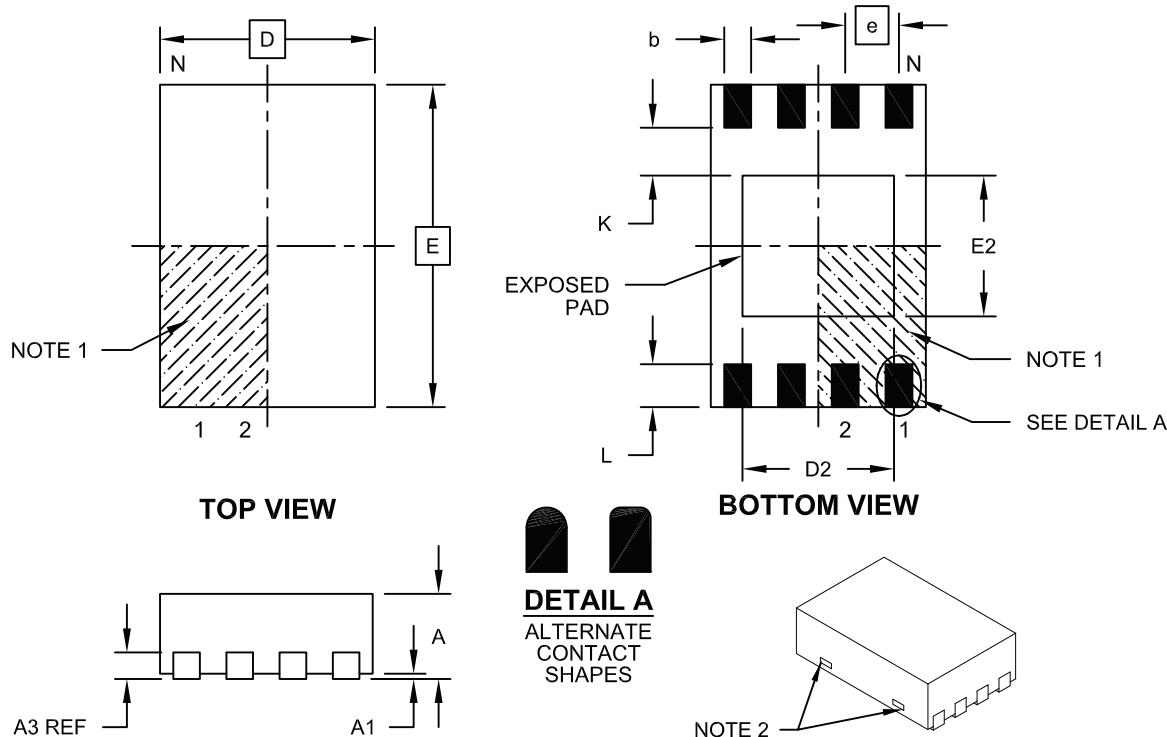
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2122A

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MN) – 2x3x0.75 mm Body [TDFN]

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 Pins	N		8		
Pitch	e		0.50	BSC	
Overall Height	A	0.70	0.75	0.80	
Standoff	A1	0.00	0.02	0.05	
Contact Thickness	A3	0.20	REF		
Overall Length	D	2.00	BSC		
Overall Width	E	3.00	BSC		
Exposed Pad Length	D2	1.20	-	1.60	
Exposed Pad Width	E2	1.20	-	1.60	
Contact Width	b	0.20	0.25	0.30	
Contact Length	L	0.25	0.30	0.45	
Contact-to-Exposed Pad	K	0.20	-	-	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated
4. Dimensioning and tolerancing per ASME Y14.5M

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

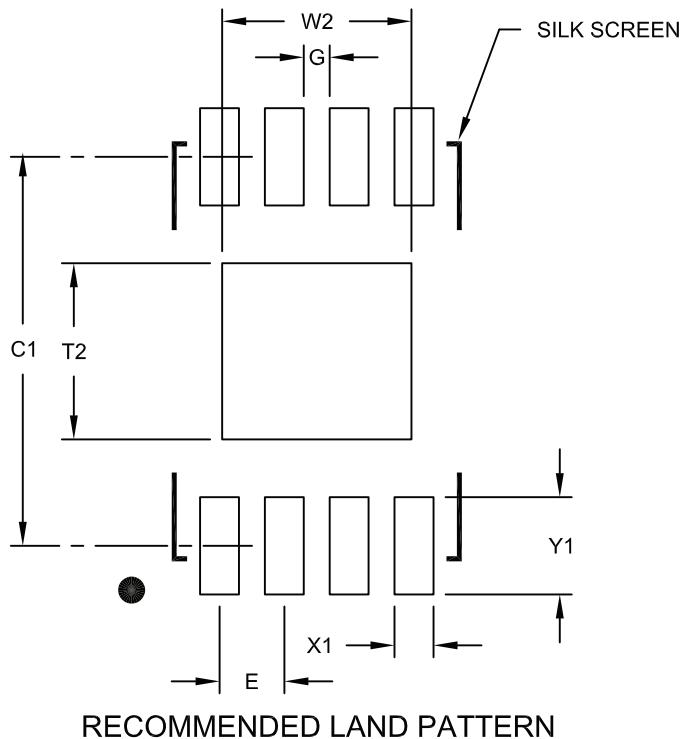
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-129B

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MN) – 2x3x0.75 mm Body [TDFN]

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
Contact Pitch	E		0.50 BSC	
Optional Center Pad Width	W2			1.46
Optional Center Pad Length	T2			1.36
Contact Pad Spacing	C1	3.00		
Contact Pad Width (X8)	X1		0.30	
Contact Pad Length (X8)	Y1		0.75	
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

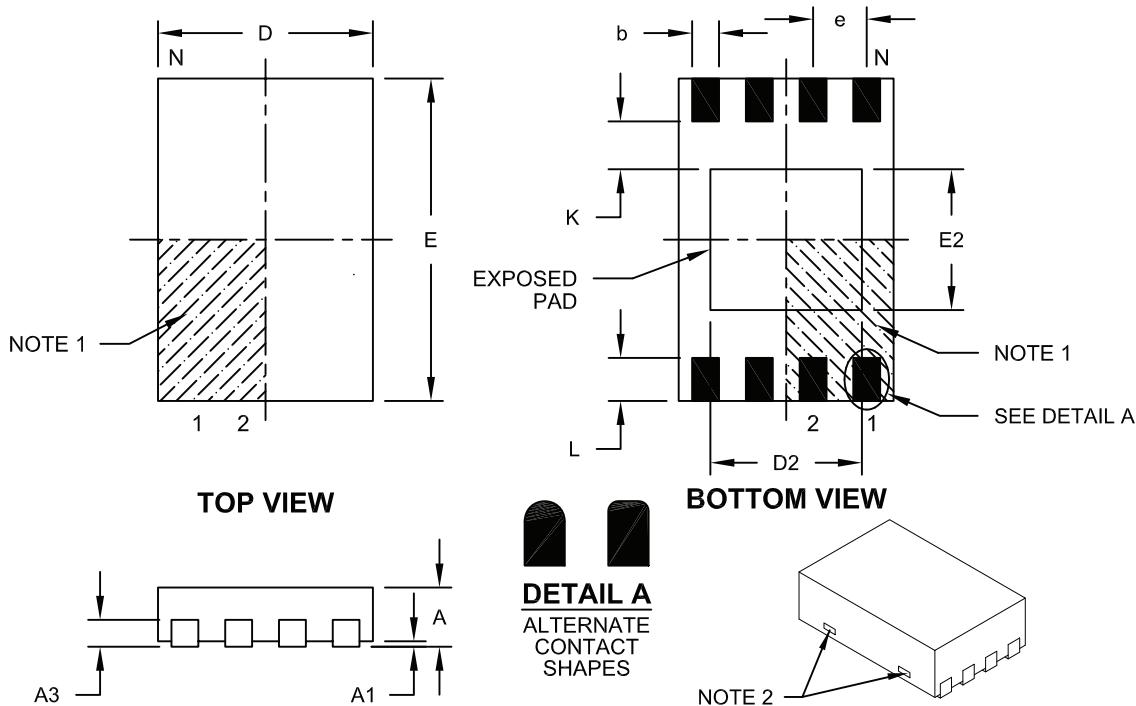
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2129A

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MU) – 2x3x0.5 mm Body [UDFN]

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 Pins	N	8		
Pitch	e	0.50	BSC	
Overall Height	A	0.45	0.50	0.55
Standoff	A1			0.07
Contact Thickness	A3	0.127 REF		
Overall Length	D	1.95	2.00	2.05
Overall Width	E	2.95	3.00	3.05
Exposed Pad Length	D2	1.30	1.40	1.50
Exposed Pad Width	E2	1.20	1.30	1.40
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.25	0.30	0.35
Contact-to-Exposed Pad	K	0.55 REF		

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated
4. Dimensioning and tolerancing per ASME Y14.5M

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

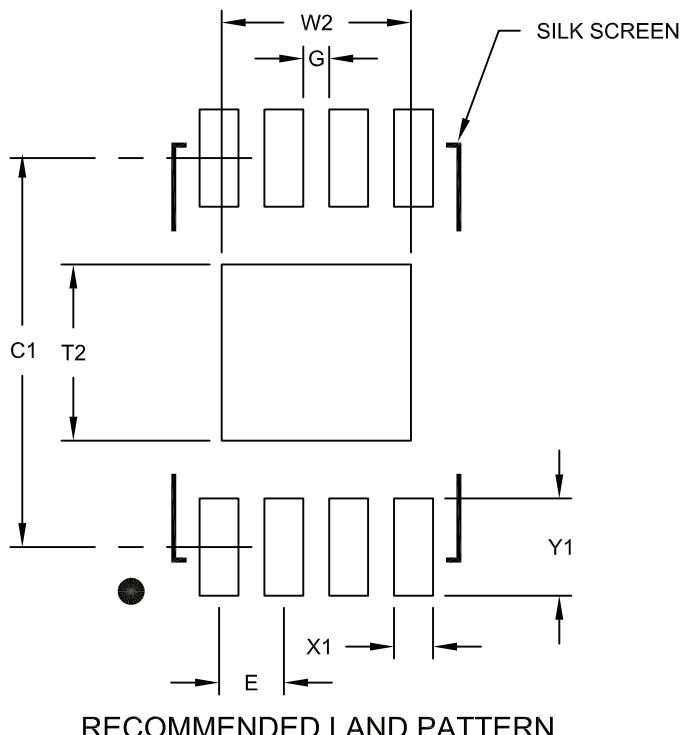
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-136B

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MU) – 2x3x0.5 mm Body [UDFN]

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	
Contact Pitch		E		0.50 BSC			
Optional Center Pad Width		W2					1.46
Optional Center Pad Length		T2					1.36
Contact Pad Spacing		C1		3.00			
Contact Pad Width (X8)		X1					0.30
Contact Pad Length (X8)		Y1					0.75
Distance Between Pads		G		0.20			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

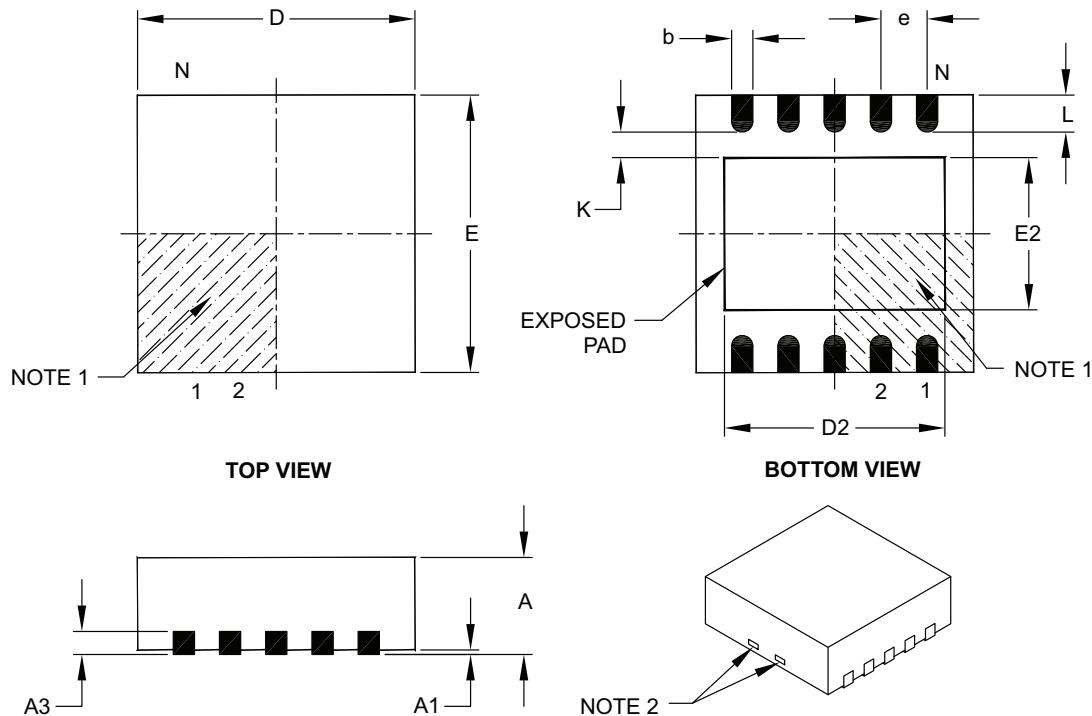
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2136A

Packaging Diagrams and Parameters

10-Lead Plastic Dual Flat, No Lead Package (MF) – 3x3x0.9 mm Body [DFN]

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 Pins		10		
Pitch		0.50 BSC		
Overall Height		A	0.80	0.90
Standoff		A1	0.00	0.02
Contact Thickness		A3	0.20 REF	
Overall Length		D	3.00 BSC	
Exposed Pad Length		D2	2.20	2.35
Overall Width		E	3.00 BSC	
Exposed Pad Width		E2	1.40	1.58
Contact Width		b	0.18	0.25
Contact Length		L	0.30	0.40
Contact-to-Exposed Pad		K	0.20	—

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

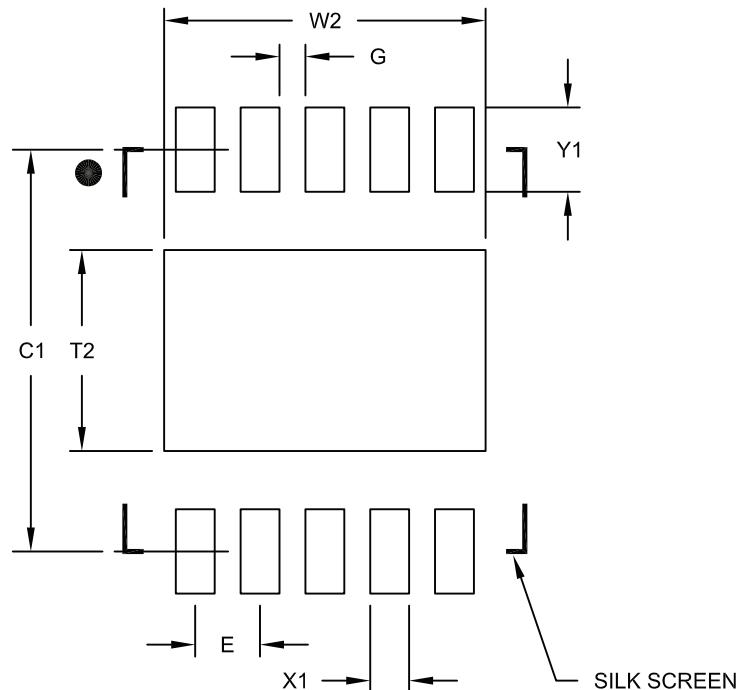
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-063B

Land Pattern (Footprint)

10-Lead Plastic Dual Flat, No Lead Package (MF) – 3x3x0.9 mm Body [DFN]

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		0.50 BSC		
Optional Center Pad Width	W2			2.48	
Optional Center Pad Length	T2			1.55	
Contact Pad Spacing	C1		3.10		
Contact Pad Width (X8)	X1			0.30	
Contact Pad Length (X8)	Y1			0.65	
Distance Between Pads	G	0.20			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

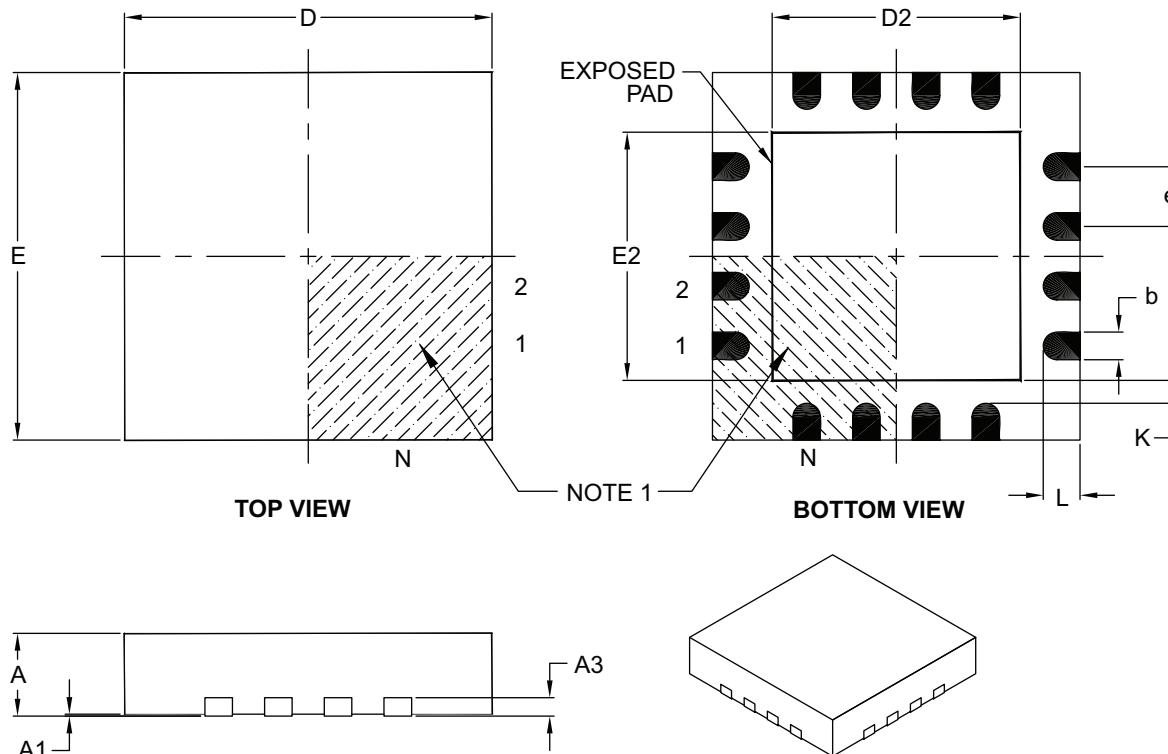
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2063A

Packaging Diagrams and Parameters

16-Lead Plastic Quad Flat, No Lead Package (ML) – 4x4x0.9 mm Body [QFN]

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 Pins	N				16		
Pitch	e				0.65	BSC	
Overall Height	A	0.80	0.90	1.00			
Standoff	A1	0.00	0.02	0.05			
Contact Thickness	A3	0.20 REF					
Overall Width	E	4.00 BSC					
Exposed Pad Width	E2	2.50	2.65	2.80			
Overall Length	D	4.00 BSC					
Exposed Pad Length	D2	2.50	2.65	2.80			
Contact Width	b	0.25	0.30	0.35			
Contact Length	L	0.30	0.40	0.50			
Contact-to-Exposed Pad	K	0.20	–	–			

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.

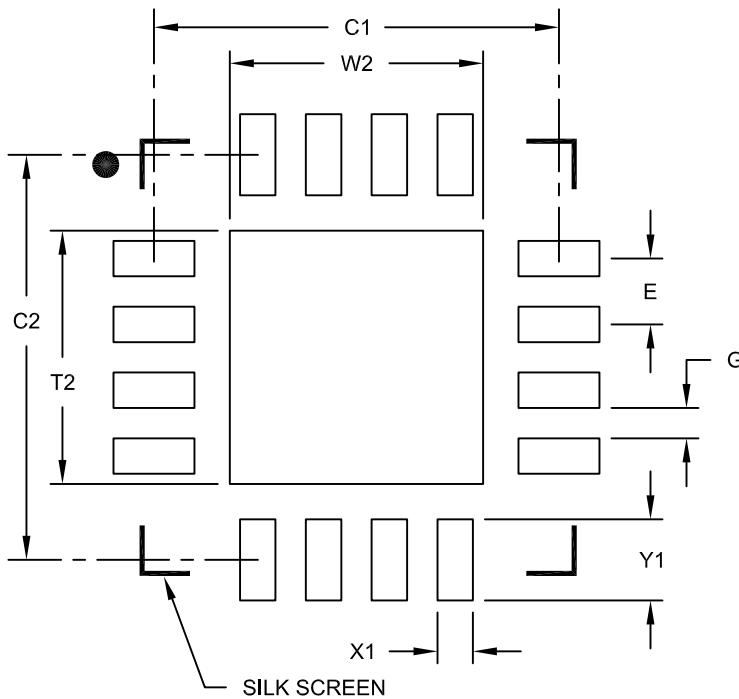
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

16-Lead Plastic Quad Flat, No Lead Package (ML) – 4x4x0.9 mm Body [QFN] Land Pattern

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		0.65 BSC	
Optional Center Pad Width	W2			2.50
Optional Center Pad Length	T2			2.50
Contact Pad Spacing	C1		4.00	
Contact Pad Spacing	C2		4.00	
Contact Pad Width (X28)	X1			0.35
Contact Pad Length (X28)	Y1			0.80
Distance Between Pads	G	0.30		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

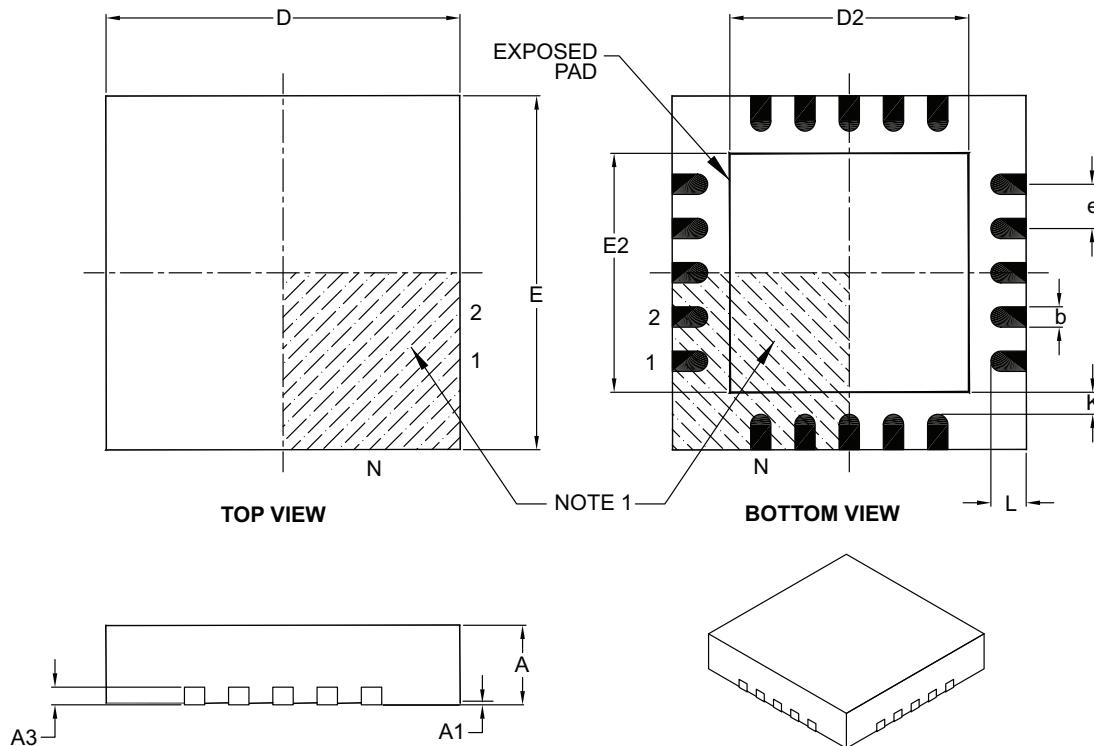
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2127A

Packaging Diagrams and Parameters

20-Lead Plastic Quad Flat, No Lead Package (ML) – 4x4x0.9 mm Body [QFN]

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 Pins	N		20	
Pitch	e		0.50 BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3		0.20 REF	
Overall Width	E		4.00 BSC	
Exposed Pad Width	E2	2.60	2.70	2.80
Overall Length	D		4.00 BSC	
Exposed Pad Length	D2	2.60	2.70	2.80
Contact Width	b	0.18	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	–	–

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.

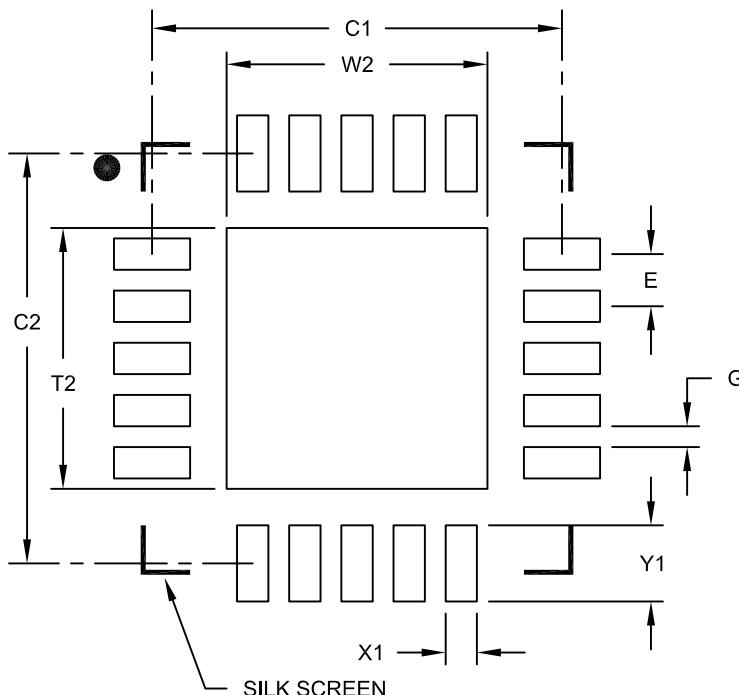
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

20-Lead Plastic Quad Flat No Lead Package (ML) – 4x4 mm Body [QFN] Land Pattern With 0.40 mm Contact Length

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		0.50	BSC
Optional Center Pad Width	W2			2.50
Optional Center Pad Length	T2			2.50
Contact Pad Spacing	C1		3.93	
Contact Pad Spacing	C2		3.93	
Contact Pad Width	X1			0.30
Contact Pad Length	Y1			0.73
Distance Between Pads	G	0.20		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

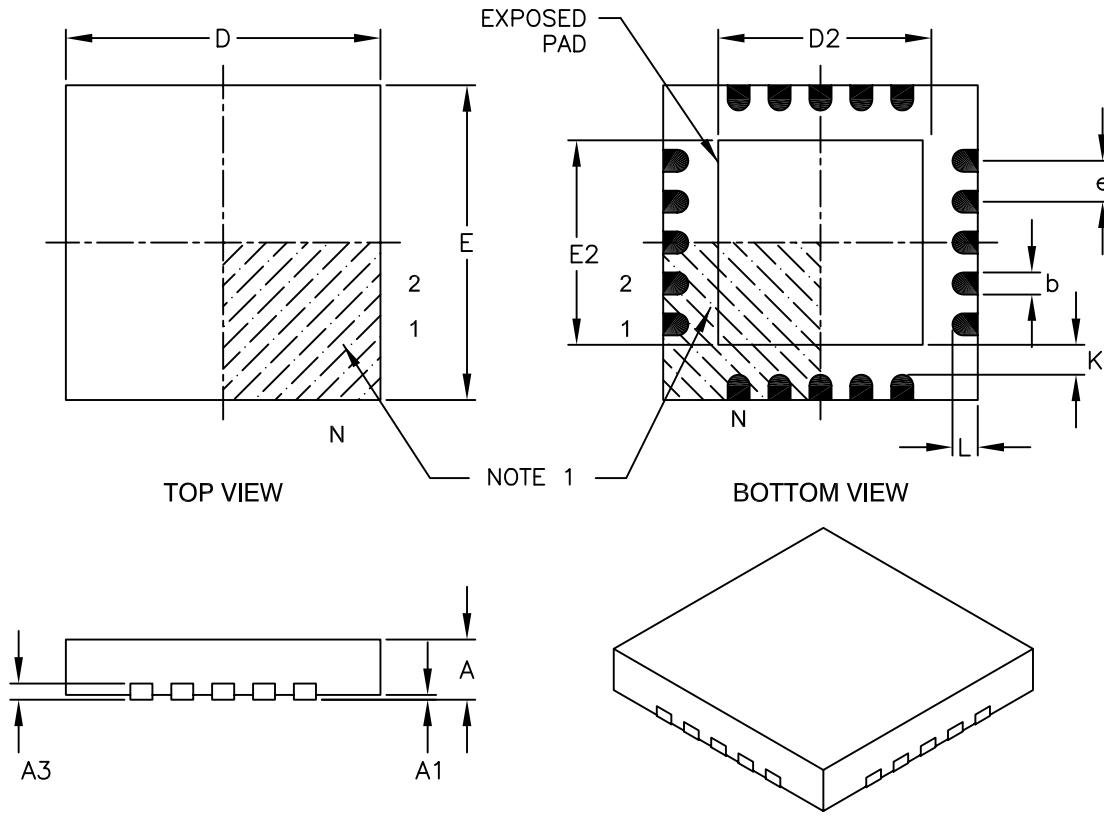
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2126A

Packaging Diagrams and Parameters

20-Lead Plastic Quad Flat, No Lead Package (MQ) – 5x5x0.9 mm Body [QFN]

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 Pins	N		20		
Pitch	e		0.65	BSC	
Overall Height	A	0.80	0.90	1.00	
Standoff	A1	0.00	0.02	0.05	
Contact Thickness	A3	0.20 REF			
Overall Width	E	5.00 BSC			
Exposed Pad Width	E2	3.15	3.25	3.35	
Overall Length	D	5.00 BSC			
Exposed Pad Length	D2	3.15	3.25	3.35	
Contact Width	b	0.25	0.30	0.35	
Contact Length	L	0.35	0.40	0.45	
Contact-to-Exposed Pad	K	0.20	-	-	

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.

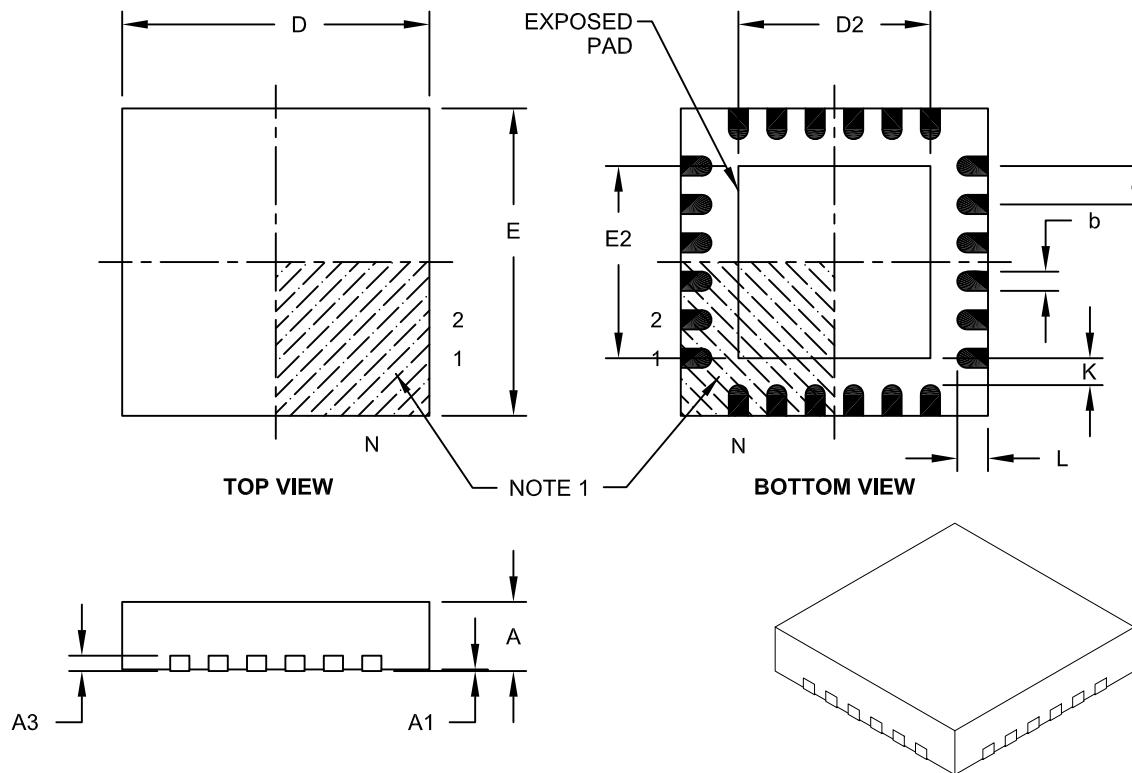
Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

24-Lead Plastic Quad Flat, No Lead Package (MJ) – 4x4x0.9 mm Body [QFN]

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 Pins	N	24		
Pitch	e	0.50	BSC	
Overall Height	A	0.80	0.85	0.90
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3	0.20	REF	
Overall Width	E	4.00	BSC	
Exposed Pad Width	E2	2.40	2.50	2.60
Overall Length	D	4.00	BSC	
Exposed Pad Length	D2	2.40	2.50	2.60
Contact Width	b	0.20	0.25	0.30
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

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.

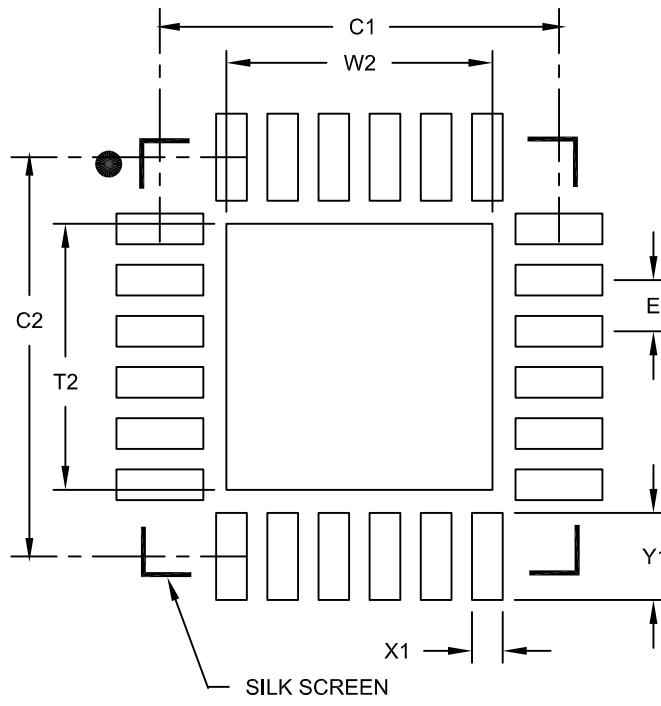
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-143A

Land Pattern (Footprint)

24-Lead Plastic Quad Flat, No Lead Package (MJ) – 4x4 mm Body [QFN] Land Pattern

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
Contact Pitch	E	0.65 BSC					
Optional Center Pad Width	W2				2.60		
Optional Center Pad Length	T2				2.60		
Contact Pad Spacing	C1			3.90			
Contact Pad Spacing	C2			3.90			
Contact Pad Width	X1				0.30		
Contact Pad Length	Y1				0.85		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

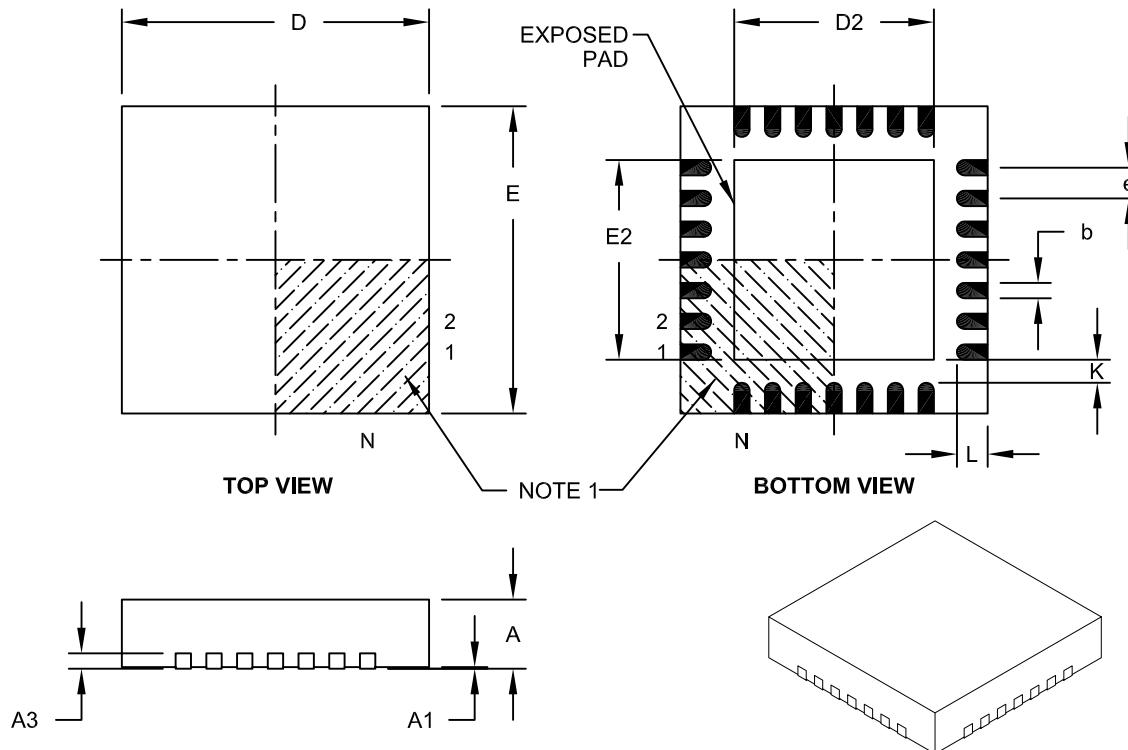
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2143A

Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (MK) – 4x4x0.9 mm Body [QFN]

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 Pins	N		28		
Pitch	e		0.40	BSC	
Overall Height	A	0.80	0.85	0.90	
Standoff	$A1$	0.00	0.02	0.05	
Contact Thickness	$A3$	0.20 REF			
Overall Width	E	4.00 BSC			
Exposed Pad Width	$E2$	2.50	2.60	2.70	
Overall Length	D	4.00 BSC			
Exposed Pad Length	$D2$	2.50	2.60	2.70	
Contact Width	b	0.17	0.20	0.25	
Contact Length	L	0.30	0.40	0.50	
Contact-to-Exposed Pad	K	0.20	-	-	

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.

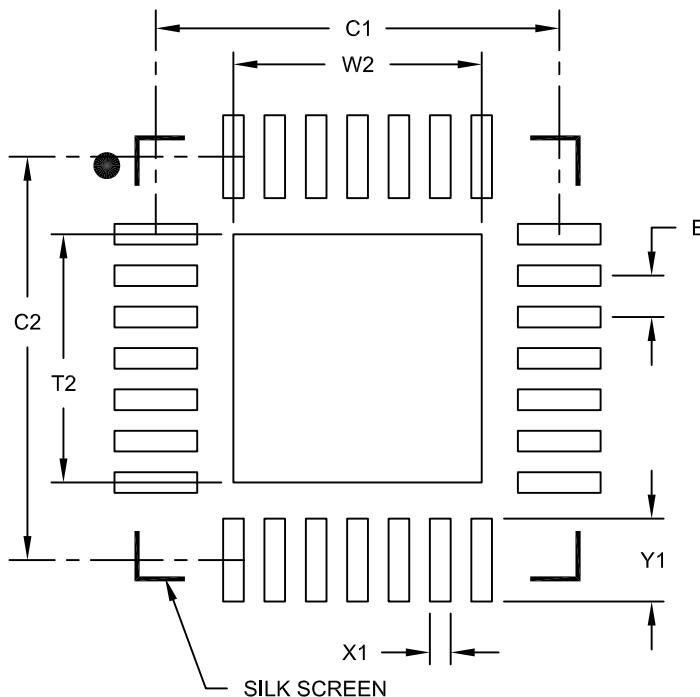
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

28-Lead Plastic Quad Flat, No Lead Package (MK) – 4x4x0.9 mm Body [QFN] Land Pattern

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	0.40 BSC		
Optional Center Pad Width	W2				2.40
Optional Center Pad Length	T2				2.40
Contact Pad Spacing	C1		3.90		
Contact Pad Spacing	C2		3.90		
Contact Pad Width	X1			0.20	
Contact Pad Length	Y1				0.80

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

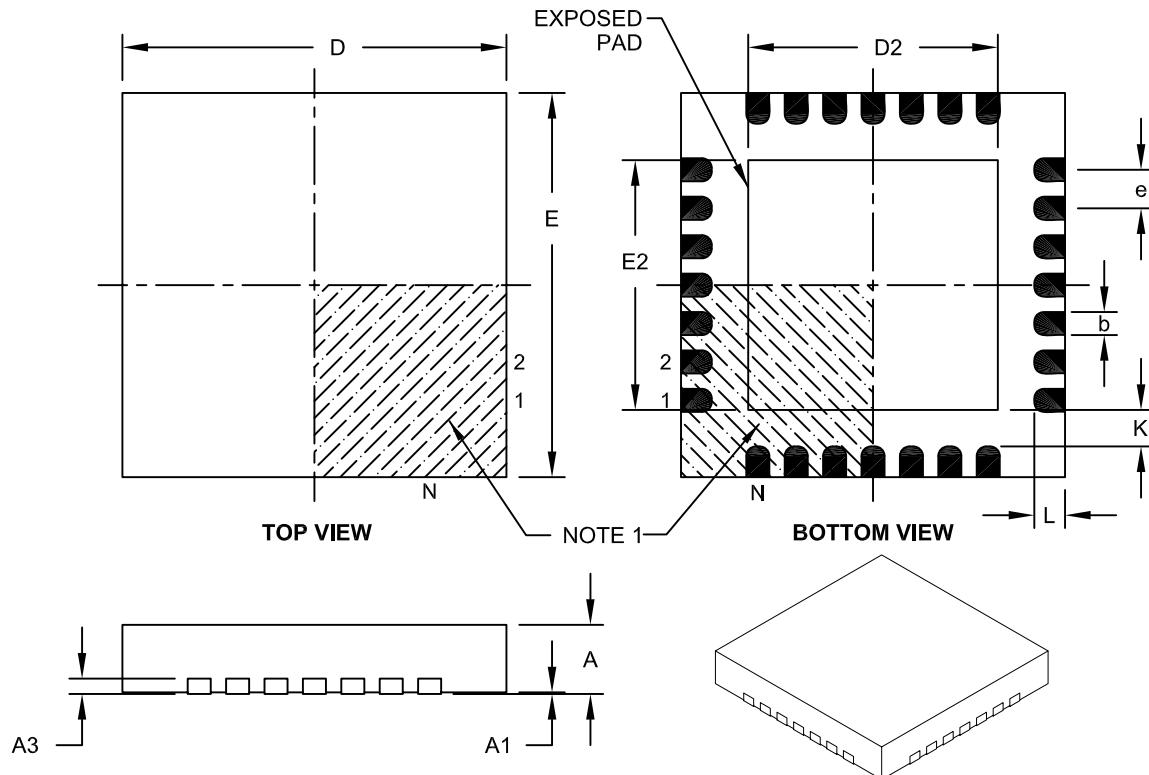
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2144A

Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (MQ) – 5x5x0.9 mm Body [QFN]

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 Pins	N				28		
Pitch	e				0.50	BSC	
Overall Height	A	0.80	0.90	1.00			
Standoff	A1	0.00	0.02	0.05			
Contact Thickness	A3	0.20 REF					
Overall Width	E	5.00 BSC					
Exposed Pad Width	E2	3.15	3.25	3.35			
Overall Length	D	5.00 BSC					
Exposed Pad Length	D2	3.15	3.25	3.35			
Contact Width	b	0.18	0.25	0.30			
Contact Length	L	0.35	0.40	0.45			
Contact-to-Exposed Pad	K	0.20	-	-			

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.

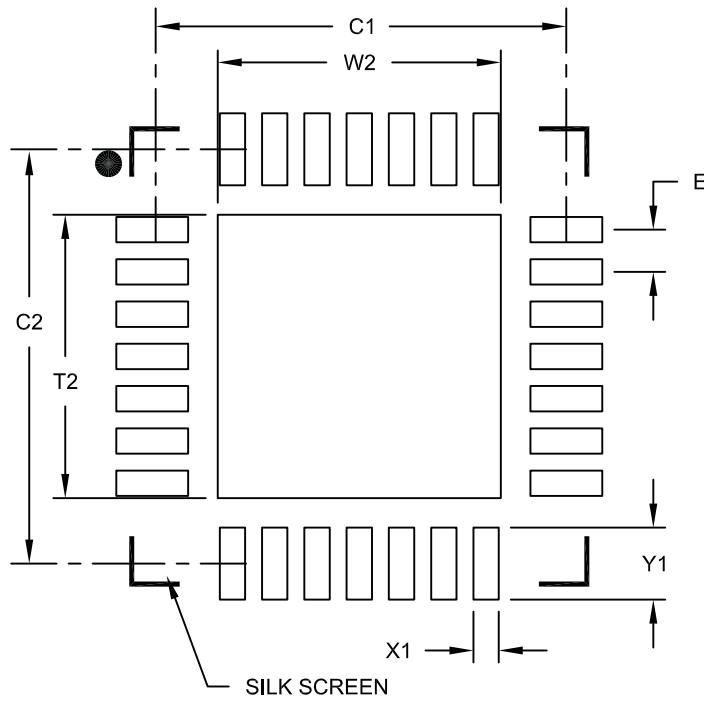
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

28-Lead Plastic Quad Flat, No Lead Package (MQ) – 5x5 mm Body [QFN] Land Pattern With 0.55 mm Contact Length

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
Contact Pitch	E		0.50	BSC
Optional Center Pad Width	W2			3.35
Optional Center Pad Length	T2			3.35
Contact Pad Spacing	C1		4.90	
Contact Pad Spacing	C2		4.90	
Contact Pad Width (X28)	X1			0.30
Contact Pad Length (X28)	Y1			0.85

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

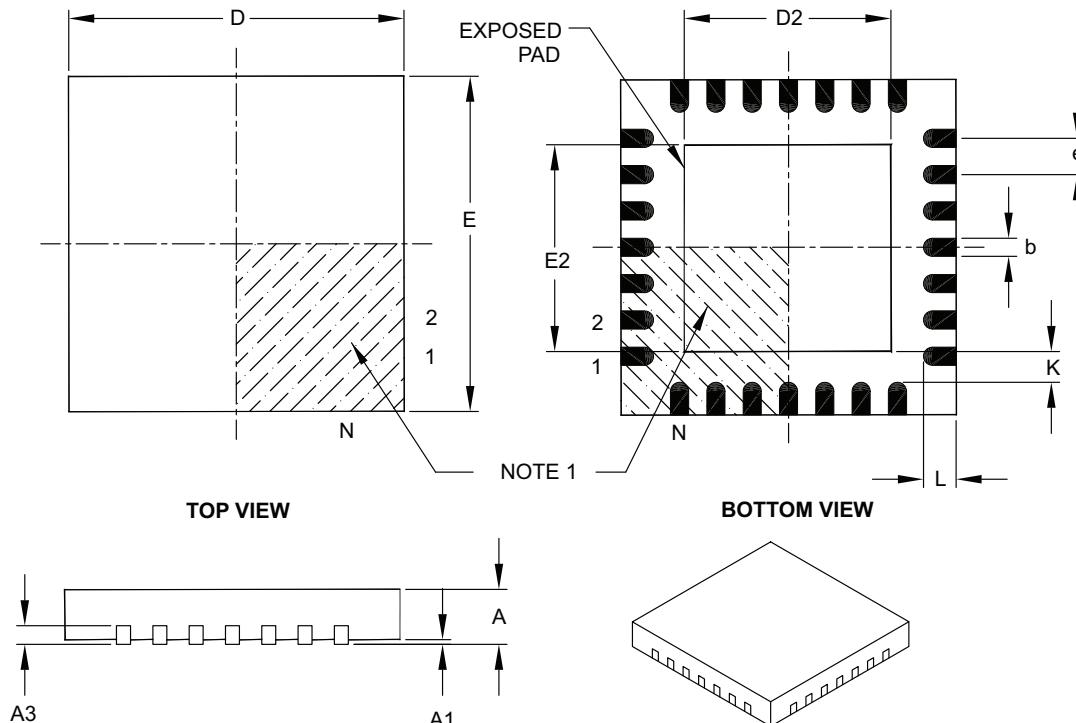
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-2140A

Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (ML) – 6x6 mm Body [QFN] with 0.55 mm Contact Length

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 Pins	N			28	
Pitch	e			0.65 BSC	
Overall Height	A	0.80	0.90	1.00	
Standoff	A1	0.00	0.02	0.05	
Contact Thickness	A3			0.20 REF	
Overall Width	E			6.00 BSC	
Exposed Pad Width	E2	3.65	3.70	4.20	
Overall Length	D			6.00 BSC	
Exposed Pad Length	D2	3.65	3.70	4.20	
Contact Width	b	0.23	0.30	0.35	
Contact Length	L	0.50	0.55	0.70	
Contact-to-Exposed Pad	K	0.20	–	–	

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.

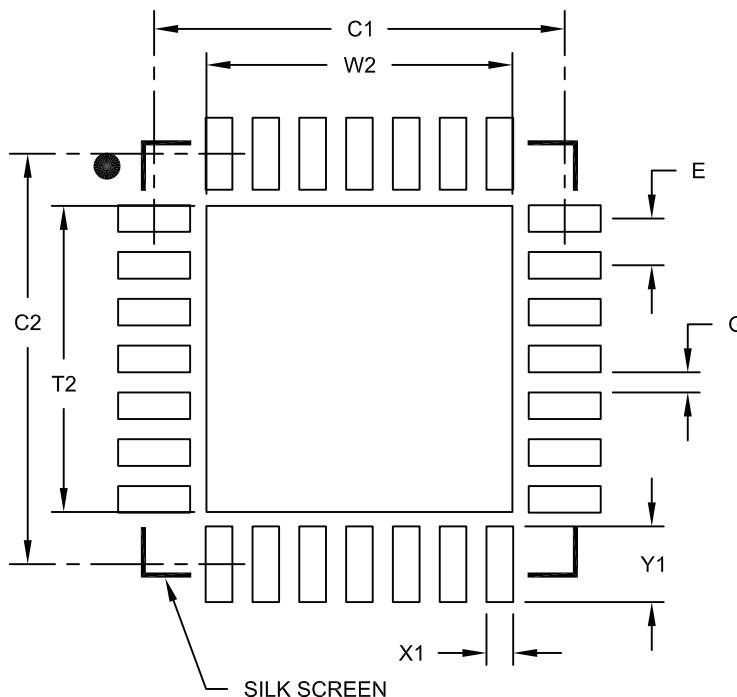
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-105B

Land Pattern (Footprint)

**28-Lead Plastic Quad Flat, No Lead Package (ML) – 6x6 mm Body [QFN]
with 0.55 mm Contact Length**

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		0.65 BSC	
Optional Center Pad Width	W2			4.25
Optional Center Pad Length	T2			4.25
Contact Pad Spacing	C1		5.70	
Contact Pad Spacing	C2		5.70	
Contact Pad Width (X28)	X1			0.37
Contact Pad Length (X28)	Y1			1.00
Distance Between Pads	G	0.20		

Notes:

- Dimensioning and tolerancing per ASME Y14.5M

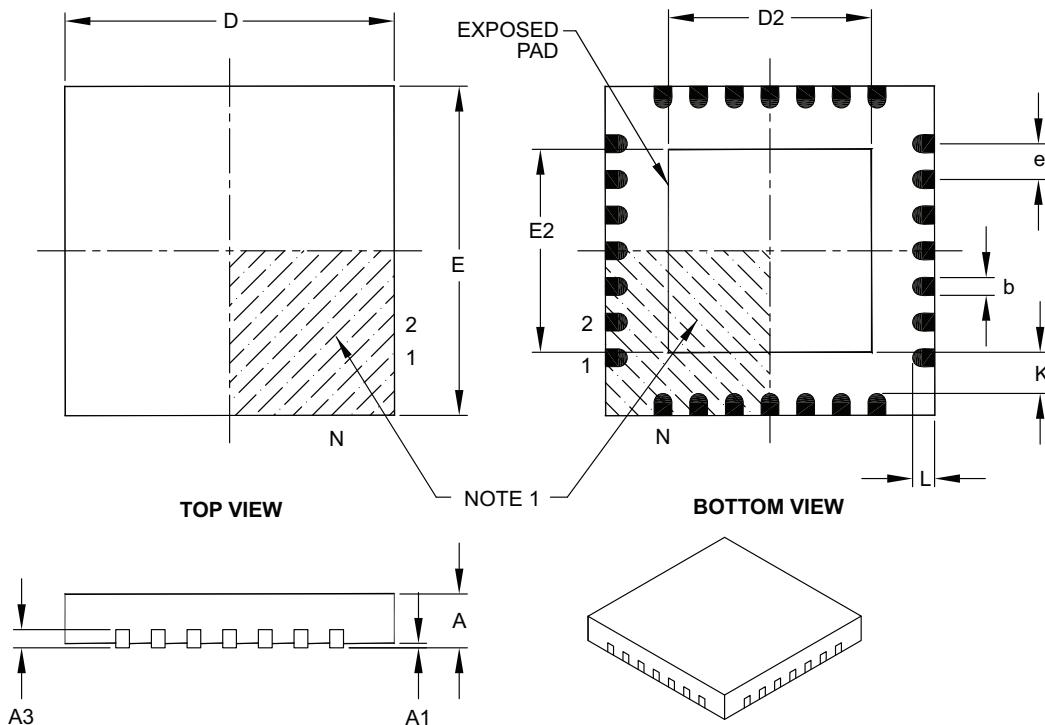
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2105A

Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (MM) – 6x6x0.9 mm Body [QFN-S] with 0.40 mm Contact Length

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 Pins	N	28		
Pitch	e	0.65	BSC	
Overall Height	A	0.80	0.90	1.00
Standoff	A1	0.00	0.02	0.05
Contact Thickness	A3	0.20	REF	
Overall Width	E	6.00	BSC	
Exposed Pad Width	E2	3.65	3.70	4.70
Overall Length	D	6.00	BSC	
Exposed Pad Length	D2	3.65	3.70	4.70
Contact Width	b	0.23	0.38	0.43
Contact Length	L	0.30	0.40	0.50
Contact-to-Exposed Pad	K	0.20	-	-

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.

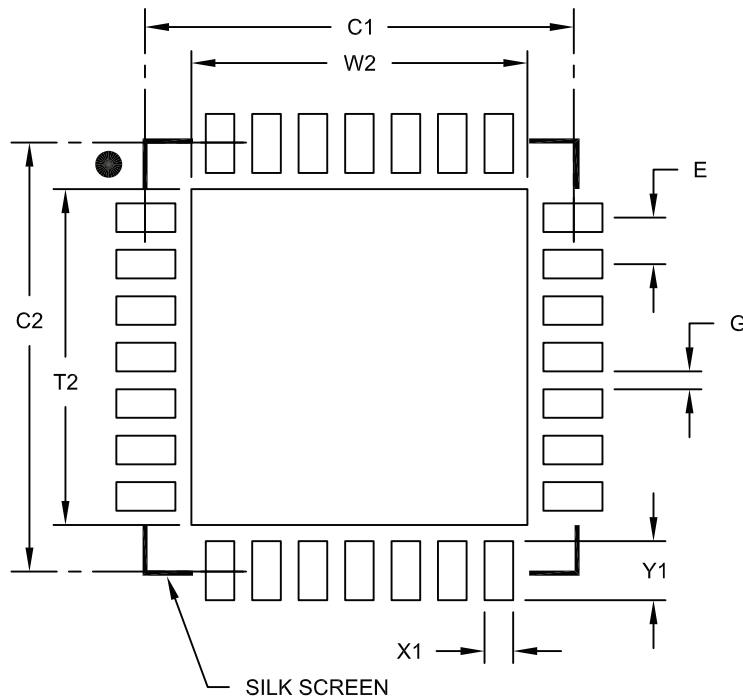
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

**28-Lead Plastic Quad Flat, No Lead Package (MM) – 6x6x0.9 mm Body [QFN-S]
with 0.40 mm Contact Length**

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		0.65 BSC	
Optional Center Pad Width	W2			4.70
Optional Center Pad Length	T2			4.70
Contact Pad Spacing	C1	6.00		
Contact Pad Spacing	C2	6.00		
Contact Pad Width (X28)	X1		0.40	
Contact Pad Length (X28)	Y1		0.85	
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

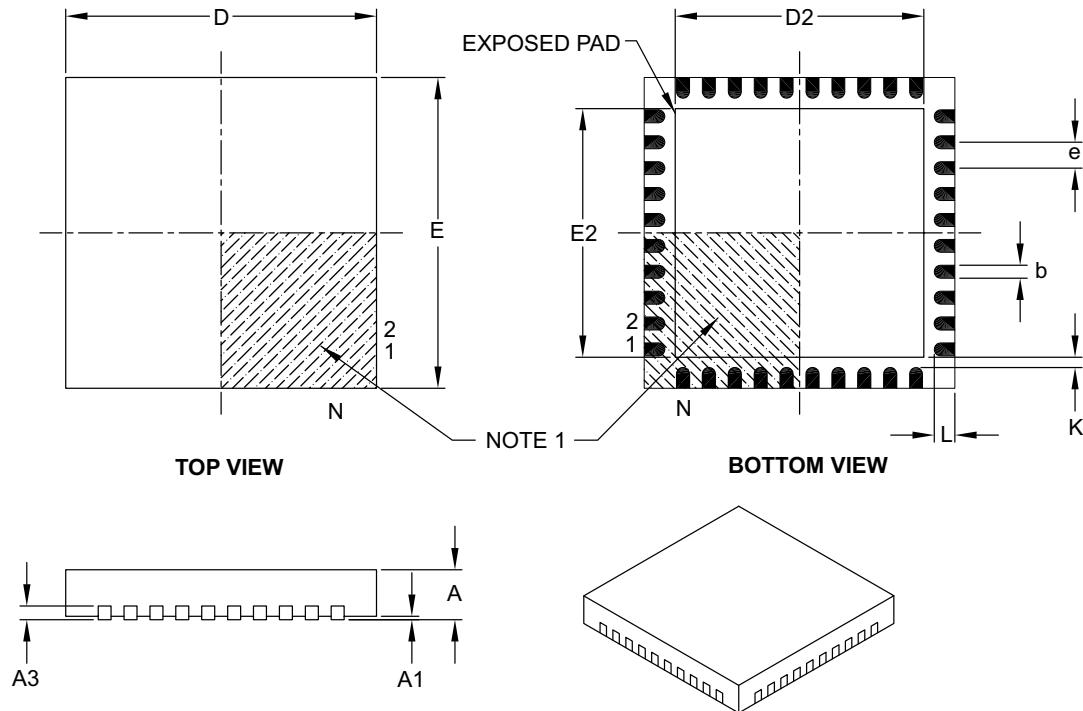
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2124A

Packaging Diagrams and Parameters

40-Lead Plastic Quad Flat, No Lead Package (ML) – 6x6x0.9 mm Body [QFN] with 0.40 mm Contact Length

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 Pins	N				40		
Pitch	e				0.50	0.50	BSC
Overall Height	A	0.80	0.90	1.00			
Standoff	A1	0.00	0.02	0.05			
Contact Thickness	A3	0.20 REF					
Overall Width	E	6.00 BSC					
Exposed Pad Width	E2	4.50	4.65	4.80			
Overall Length	D	6.00 BSC					
Exposed Pad Length	D2	4.50	4.65	4.80			
Contact Width	b	0.18	0.25	0.30			
Contact Length	L	0.30	0.40	0.50			
Contact-to-Exposed Pad	K	0.20	—	—			

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 C04-118C

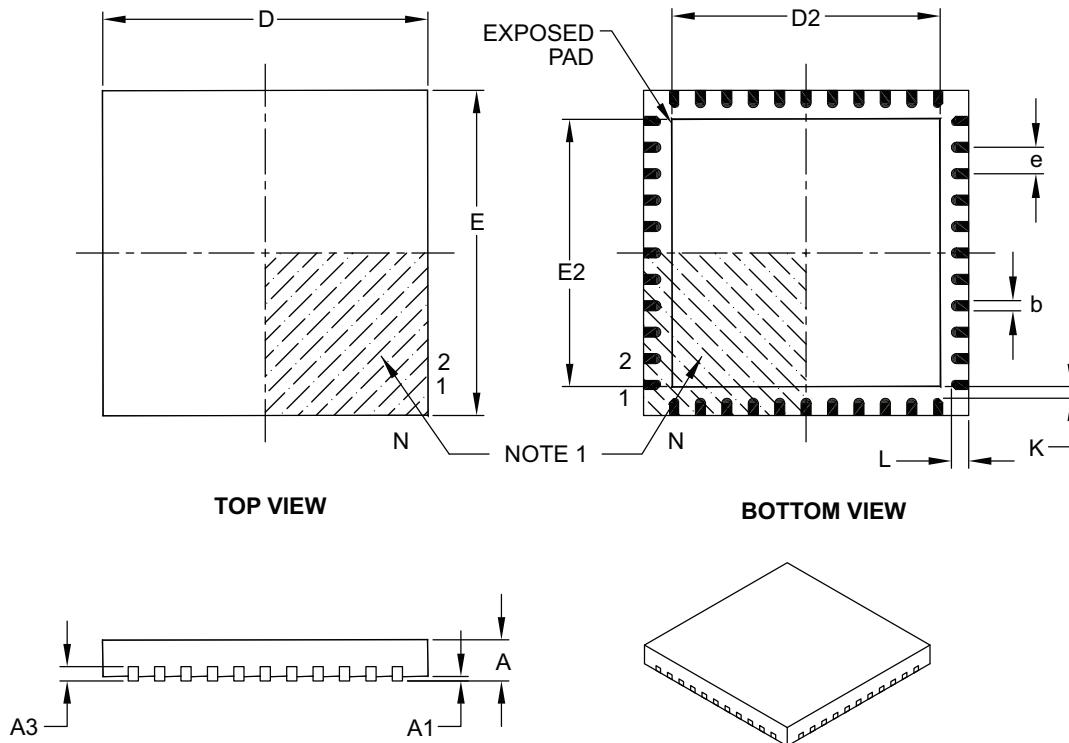
Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

44-Lead Plastic Quad Flat, No Lead Package (ML) – 8x8 mm Body [QFN]

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 Pins	N		44		
Pitch	e		0.65	BSC	
Overall Height	A	0.80	0.90	1.00	
Standoff	A1	0.00	0.02	0.05	
Contact Thickness	A3	0.20	REF		
Overall Width	E	8.00	BSC		
Exposed Pad Width	E2	6.30	6.45	6.80	
Overall Length	D	8.00	BSC		
Exposed Pad Length	D2	6.30	6.45	6.80	
Contact Width	b	0.25	0.30	0.38	
Contact Length	L	0.30	0.40	0.50	
Contact-to-Exposed Pad	K	0.20	–	–	

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.

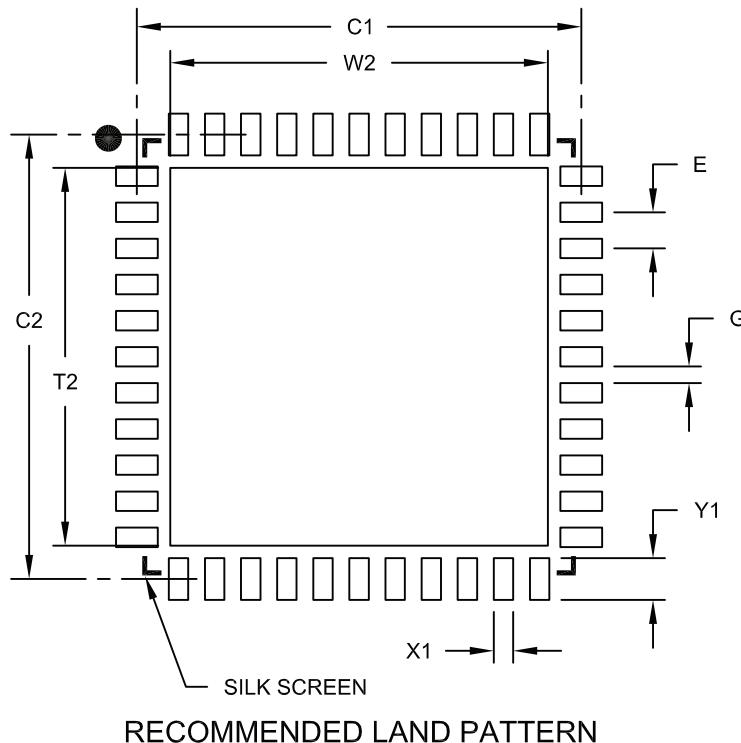
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

44-Lead Plastic Quad Flat, No Lead Package (ML) – 8x8 mm Body [QFN]

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
Contact Pitch	E		0.65 BSC	
Optional Center Pad Width	W2			6.80
Optional Center Pad Length	T2			6.80
Contact Pad Spacing	C1		8.00	
Contact Pad Spacing	C2		8.00	
Contact Pad Width (X44)	X1			0.35
Contact Pad Length (X44)	Y1			0.80
Distance Between Pads	G	0.25		

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

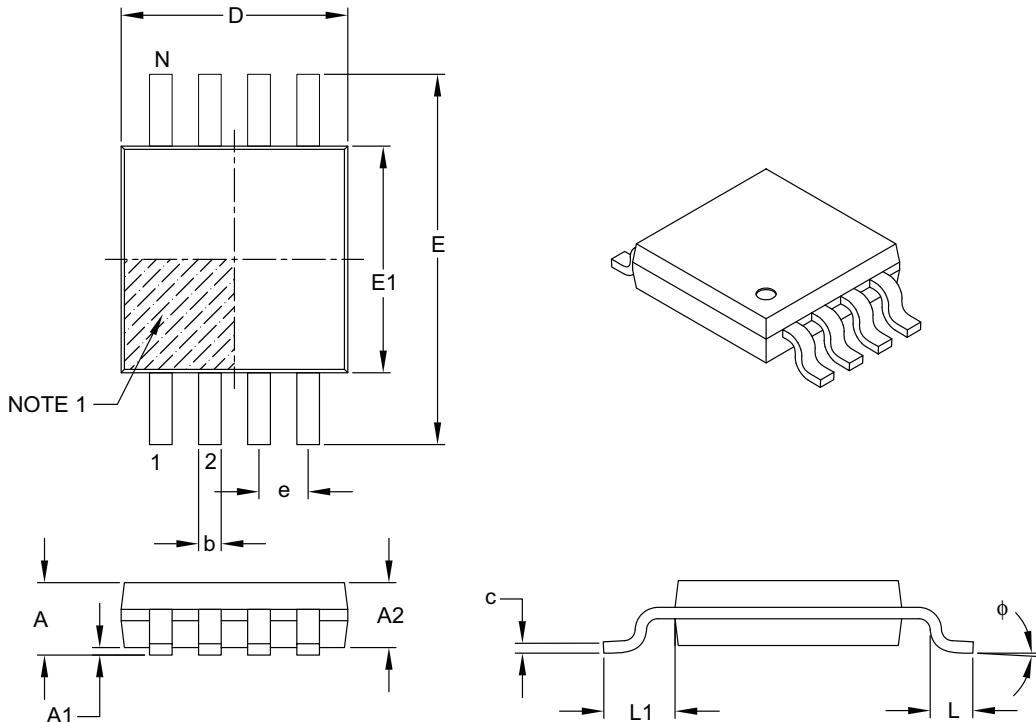
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2103A

Packaging Diagrams and Parameters

8-Lead Plastic Micro Small Outline Package (MS) [MSOP]

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 Pins	N	8		
Pitch	e	0.65 BSC		
Overall Height	A	—	—	1.10
Molded Package Thickness	A2	0.75	0.85	0.95
Standoff	A1	0.00	—	0.15
Overall Width	E	4.90 BSC		
Molded Package Width	E1	3.00 BSC		
Overall Length	D	3.00 BSC		
Foot Length	L	0.40	0.60	0.80
Footprint	L1	0.95 REF		
Foot Angle	ϕ	0°	—	8°
Lead Thickness	c	0.08	—	0.23
Lead Width	b	0.22	—	0.40

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

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

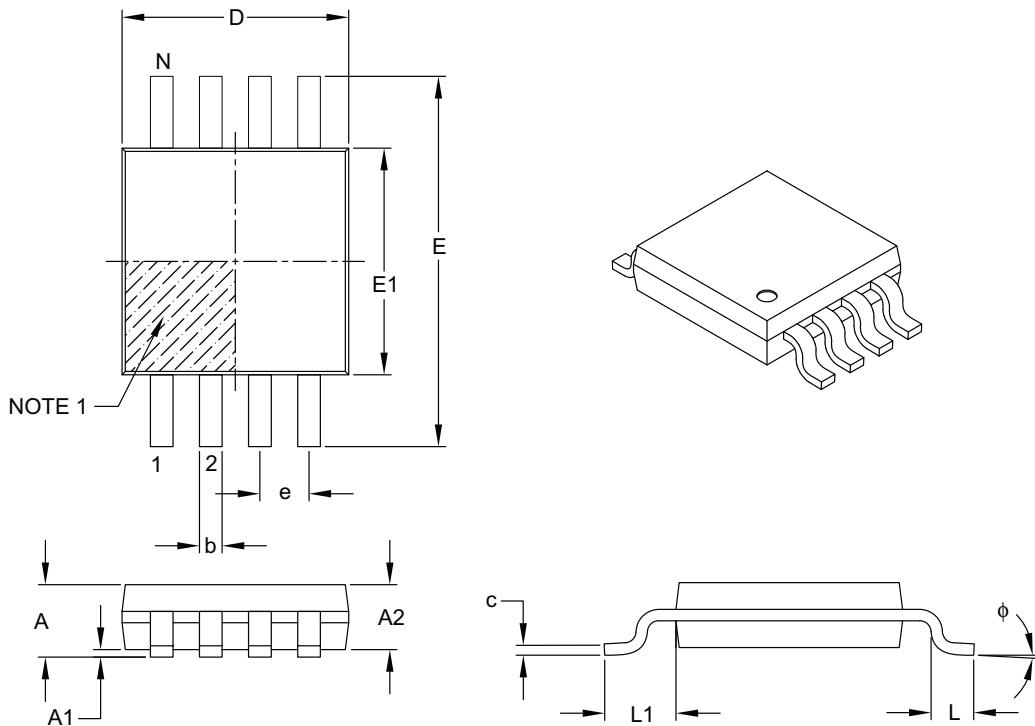
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-111B

Packaging Diagrams and Parameters

8-Lead Plastic Micro Small Outline Package (UA) [MSOP]

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 Pins		N	8		
Pitch		e	0.65 BSC		
Overall Height		A	—	—	1.10
Molded Package Thickness		A2	0.75	0.85	0.95
Standoff		A1	0.00	—	0.15
Overall Width		E	4.90 BSC		
Molded Package Width		E1	3.00 BSC		
Overall Length		D	3.00 BSC		
Foot Length		L	0.40	0.60	0.80
Footprint		L1	0.95 REF		
Foot Angle		φ	0°	—	8°
Lead Thickness		c	0.08	—	0.23
Lead Width		b	0.22	—	0.40

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

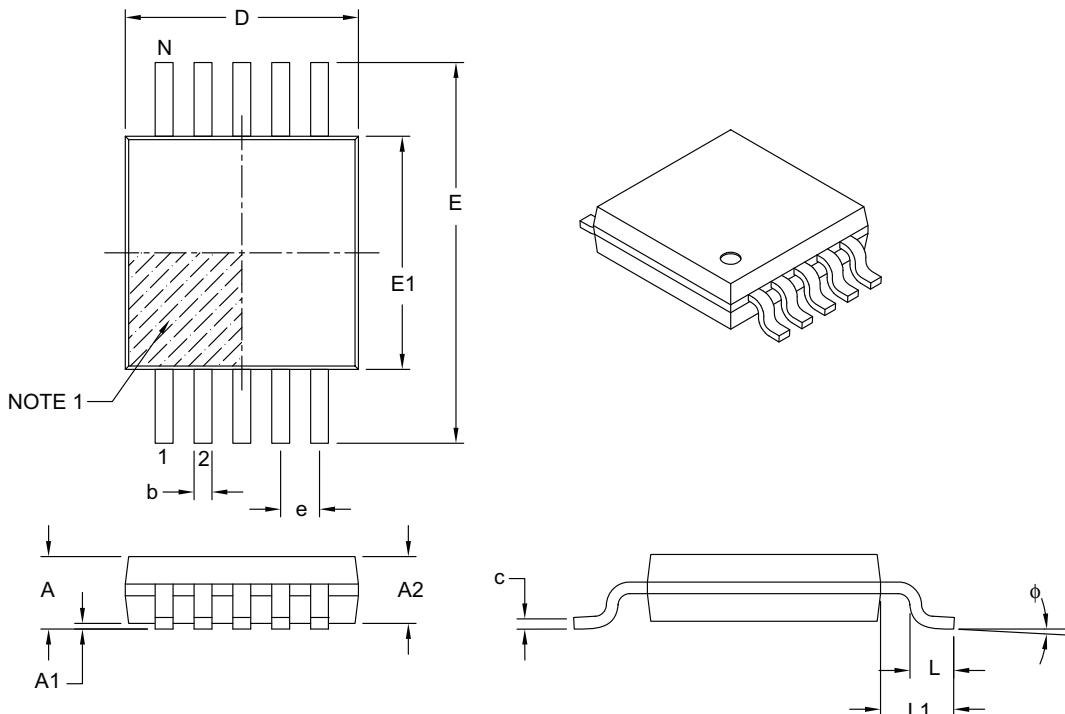
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

10-Lead Plastic Micro Small Outline Package (MS) [MSOP]

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 Pins	N		10		
Pitch	e		0.50	BSC	
Overall Height	A		–	–	1.10
Molded Package Thickness	A2		0.75	0.85	0.95
Standoff	A1		0.00	–	0.15
Overall Width	E		4.90	BSC	
Molded Package Width	E1		3.00	BSC	
Overall Length	D		3.00	BSC	
Foot Length	L		0.40	0.60	0.80
Footprint	L1		0.95 REF		
Foot Angle	ϕ		0°	–	8°
Lead Thickness	c		0.08	–	0.23
Lead Width	b		0.15	–	0.33

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

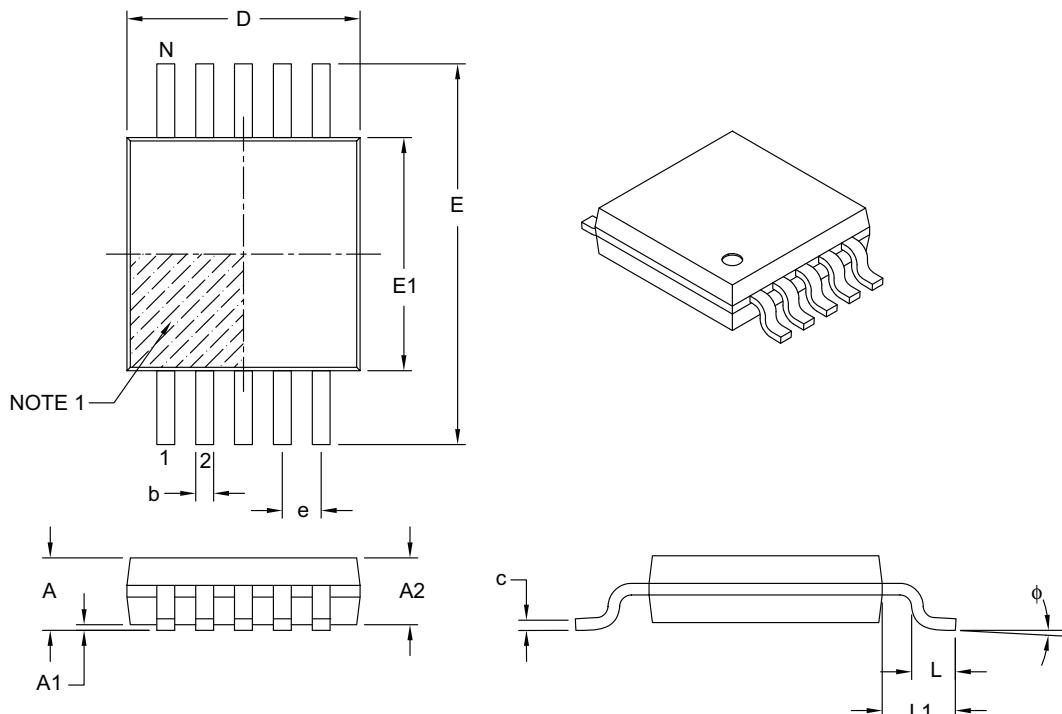
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

10-Lead Plastic Micro Small Outline Package (UN) [MSOP]

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 Pins	N		10		
Pitch	e		0.50	BSC	
Overall Height	A	—	—	1.10	
Molded Package Thickness	A2	0.75	0.85	0.95	
Standoff	A1	0.00	—	0.15	
Overall Width	E	4.90	BSC		
Molded Package Width	E1	3.00	BSC		
Overall Length	D	3.00	BSC		
Foot Length	L	0.40	0.60	0.80	
Footprint	L1		0.95	REF	
Foot Angle	φ	0°	—	8°	
Lead Thickness	c	0.08	—	0.23	
Lead Width	b	0.15	—	0.33	

Notes:

- Pin 1 visual index feature may vary, but must be located within the hatched area.
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

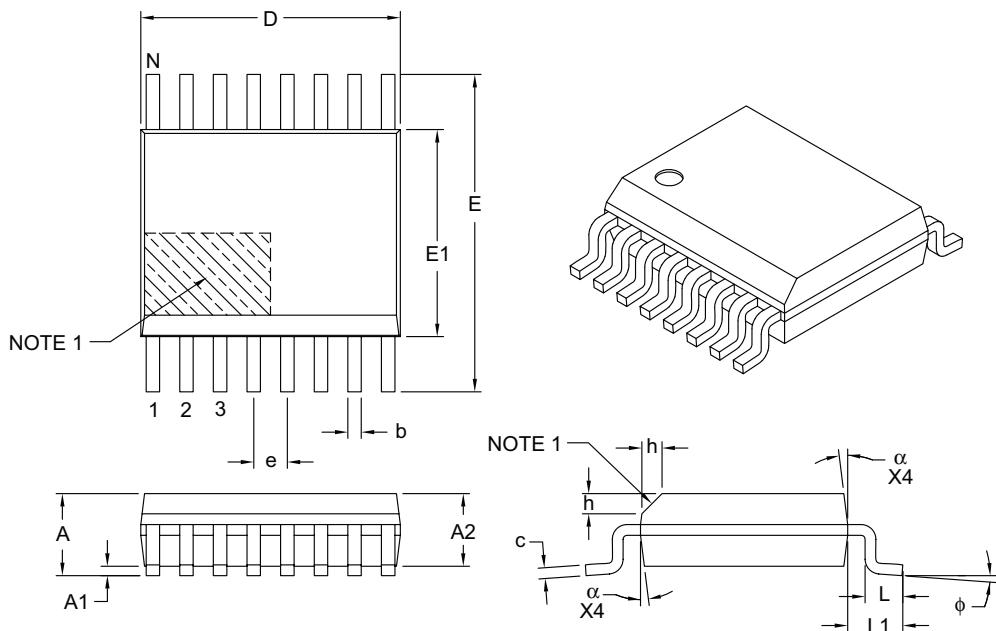
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

16-Lead Plastic Shrink Small Outline Narrow Body (QR) – .150" Body [QSOP]

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



		Units		
		INCHES		
Dimension Limits		MIN	NOM	MAX
Number of Pins	N		16	
Pitch	e		.025 BSC	
Overall Height	A	–	–	.069
Standoff §	A1	.004	–	.010
Molded Package Height	A2	.049	–	–
Overall Width	E		.236 BSC	
Molded Package Width	E1		.154 BSC	
Overall Length	D		.193 BSC	
Chamfer Distance	h	.010	–	.020
Lead Thickness	c	.006	–	.010
Lead Width	b	.008	–	.012
Footprint	L1		.041 REF	
Foot Length	L	.016	–	.050
Foot Angle	ϕ	0°	–	8°
Molded Draft Angle	α	5°	–	15°

Notes:

1. Chamfer feature is optional. If it is not present, then a Pin 1 visual index feature must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .006" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

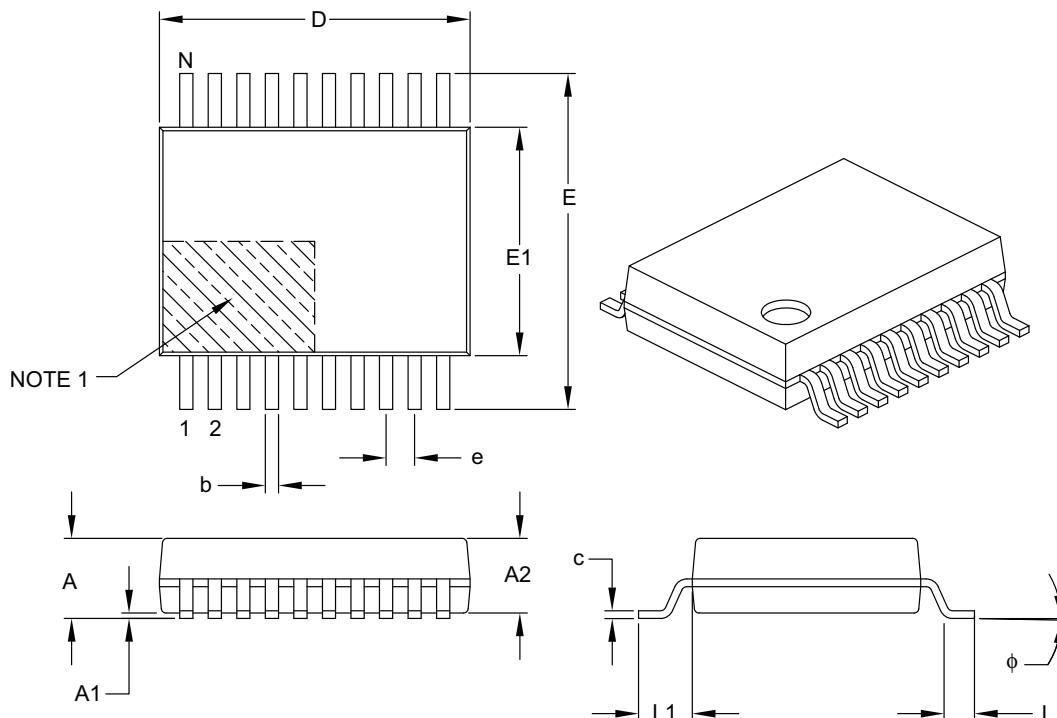
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-024C

Packaging Diagrams and Parameters

20-Lead Plastic Shrink Small Outline (SS) – 5.30 mm Body [SSOP]

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 Pins	N		20		
Pitch	e		0.65	BSC	
Overall Height	A	—	—	2.00	
Molded Package Thickness	A2	1.65	1.75	1.85	
Standoff	A1	0.05	—	—	
Overall Width	E	7.40	7.80	8.20	
Molded Package Width	E1	5.00	5.30	5.60	
Overall Length	D	6.90	7.20	7.50	
Foot Length	L	0.55	0.75	0.95	
Footprint	L1	1.25 REF			
Lead Thickness	c	0.09	—	0.25	
Foot Angle	φ	0°	4°	8°	
Lead Width	b	0.22	—	0.38	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.20 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

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

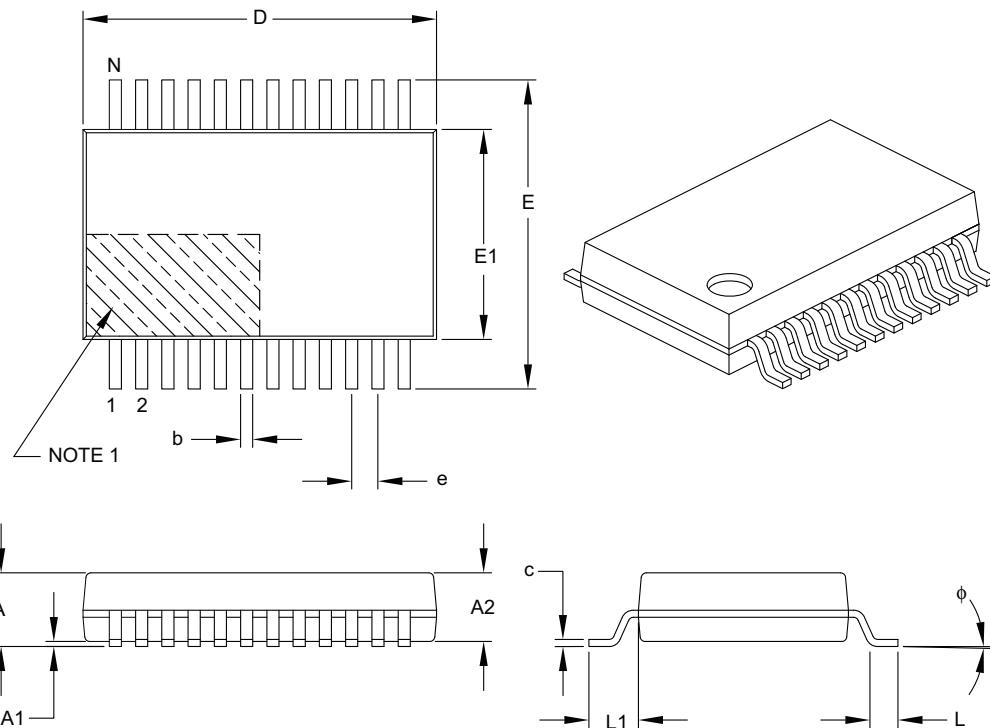
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-072B

Packaging Diagrams and Parameters

24-Lead Plastic Shrink Small Outline (SS) – 5.30 mm Body [SSOP]

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 Pins	N				24		
Pitch	e				0.65 BSC		
Overall Height	A	—	—	—	2.00		
Molded Package Thickness	A2	1.65	1.75	—	1.85		
Standoff	A1	0.05	—	—	—		
Overall Width	E	7.40	7.80	8.20	8.50		
Molded Package Width	E1	5.00	5.30	5.60	—		
Overall Length	D	7.90	8.20	8.50	—		
Foot Length	L	0.55	0.75	0.95	—		
Footprint	L1	1.25 REF					
Lead Thickness	c	0.09	—	0.25	—		
Foot Angle	phi	0°	4°	8°	—		
Lead Width	b	0.22	—	0.38	—		

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.20 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

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

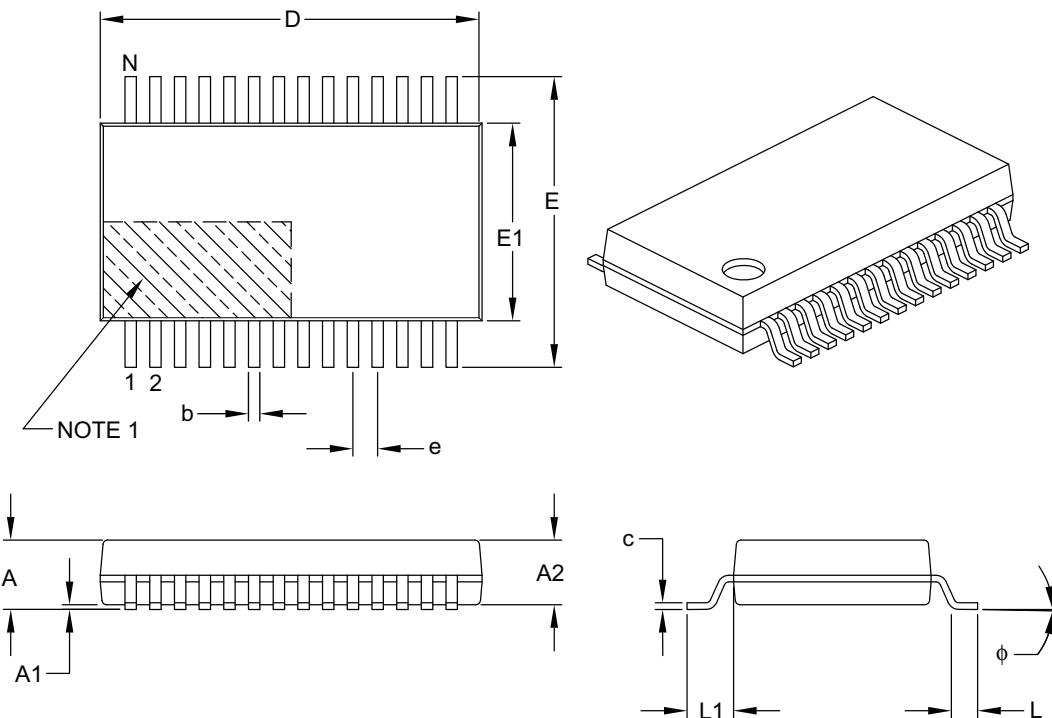
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-132B

Packaging Diagrams and Parameters

28-Lead Plastic Shrink Small Outline (SS) – 5.30 mm Body [SSOP]

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 Pins	N	28		
Pitch	e	0.65	BSC	
Overall Height	A	—	—	2.00
Molded Package Thickness	A2	1.65	1.75	1.85
Standoff	A1	0.05	—	—
Overall Width	E	7.40	7.80	8.20
Molded Package Width	E1	5.00	5.30	5.60
Overall Length	D	9.90	10.20	10.50
Foot Length	L	0.55	0.75	0.95
Footprint	L1	1.25 REF		
Lead Thickness	c	0.09	—	0.25
Foot Angle	phi	0°	4°	8°
Lead Width	b	0.22	—	0.38

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.20 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

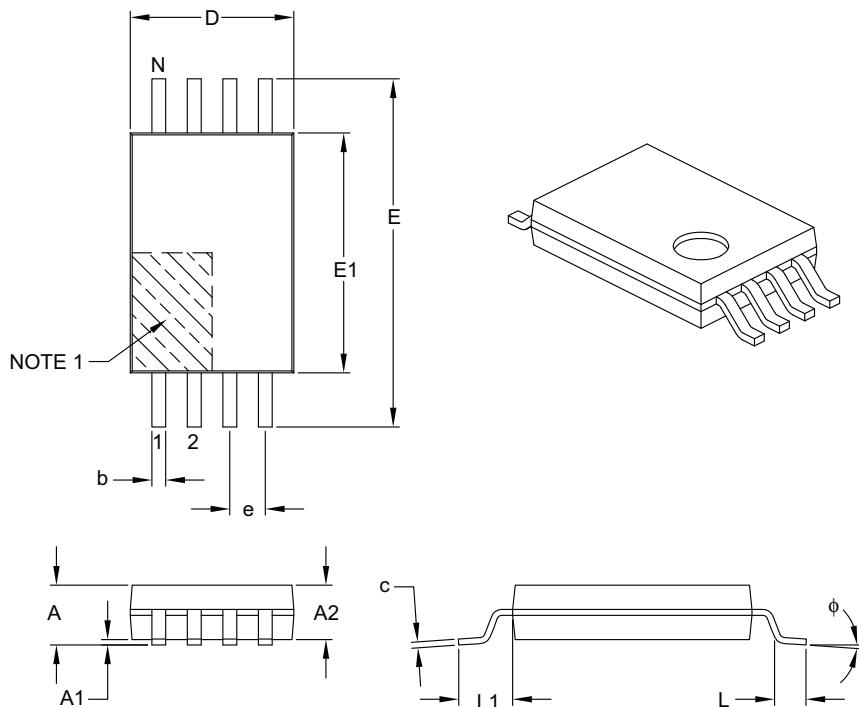
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

8-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

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 Pins	N		8		
Pitch	e		0.65 BSC		
Overall Height	A		–	–	1.20
Molded Package Thickness	A2		0.80	1.00	1.05
Standoff	A1		0.05	–	0.15
Overall Width	E		6.40 BSC		
Molded Package Width	E1		4.30	4.40	4.50
Molded Package Length	D		2.90	3.00	3.10
Foot Length	L		0.45	0.60	0.75
Footprint	L1		1.00 REF		
Foot Angle	ϕ		0°	–	8°
Lead Thickness	c		0.09	–	0.20
Lead Width	b		0.19	–	0.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

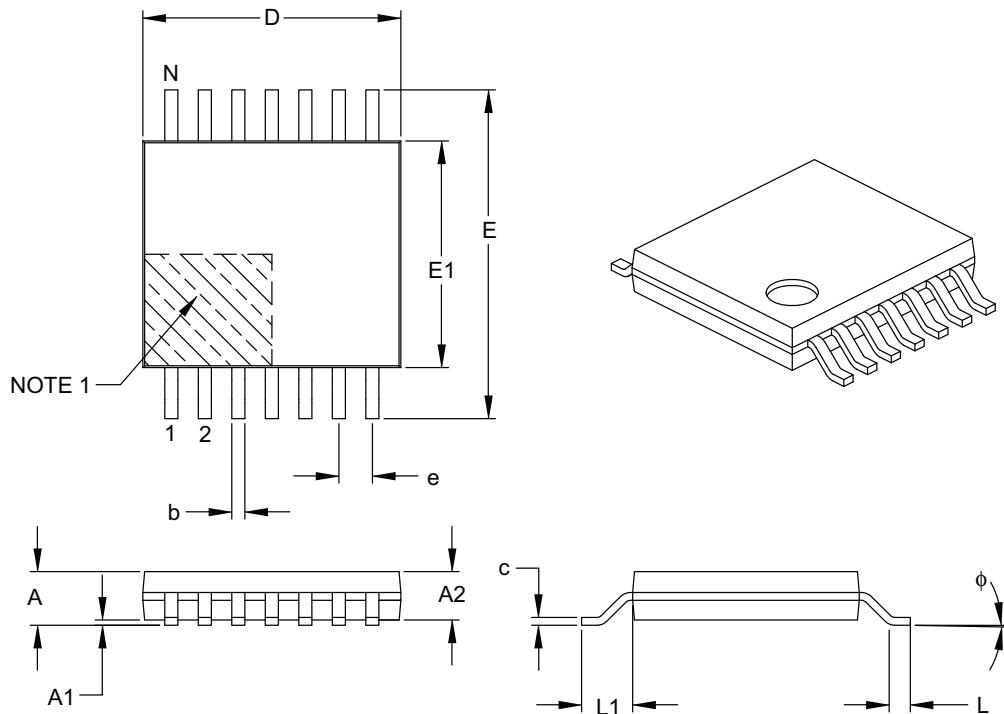
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

14-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

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 Pins		N	14		
Pitch		e	0.65 BSC		
Overall Height		A	–	–	1.20
Molded Package Thickness		A2	0.80	1.00	1.05
Standoff		A1	0.05	–	0.15
Overall Width		E	6.40 BSC		
Molded Package Width		E1	4.30	4.40	4.50
Molded Package Length		D	4.90	5.00	5.10
Foot Length		L	0.45	0.60	0.75
Footprint		L1	1.00 REF		
Foot Angle		phi	0°	–	8°
Lead Thickness		c	0.09	–	0.20
Lead Width		b	0.19	–	0.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

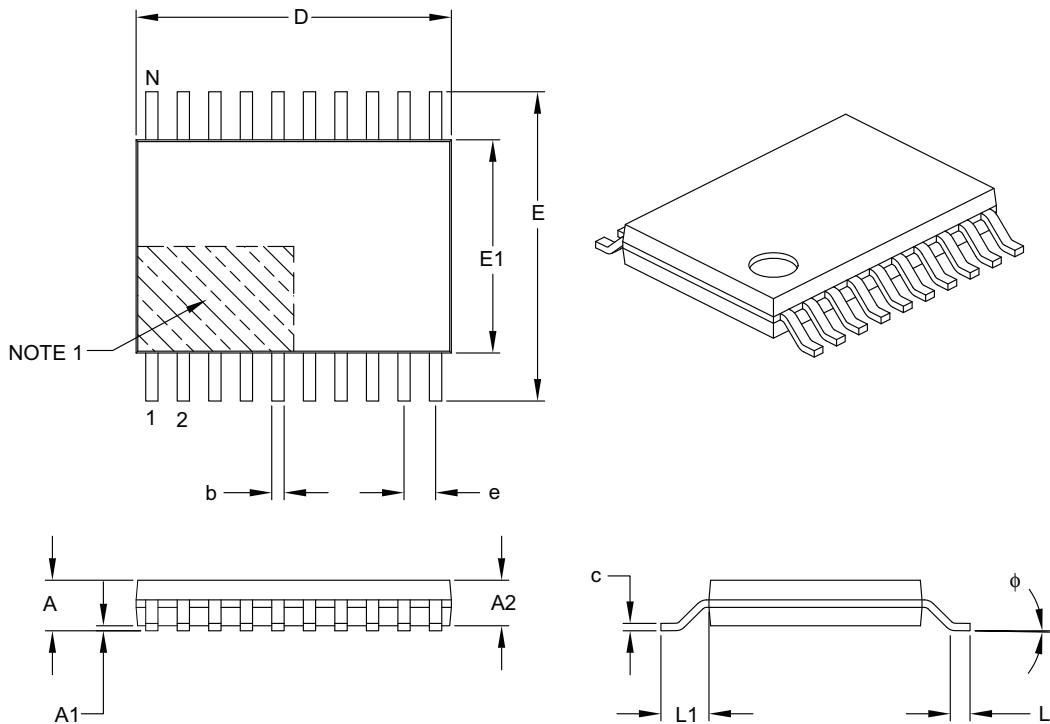
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

20-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm Body [TSSOP]

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



Dimension Limits		MILLIMETERS		
		MIN	NOM	MAX
Number of Pins	N	20		
Pitch	e	0.65 BSC		
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.80	1.00	1.05
Standoff	A1	0.05	–	0.15
Overall Width	E	6.40 BSC		
Molded Package Width	E1	4.30	4.40	4.50
Molded Package Length	D	6.40	6.50	6.60
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	ϕ	0°	–	8°
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.19	–	0.30

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

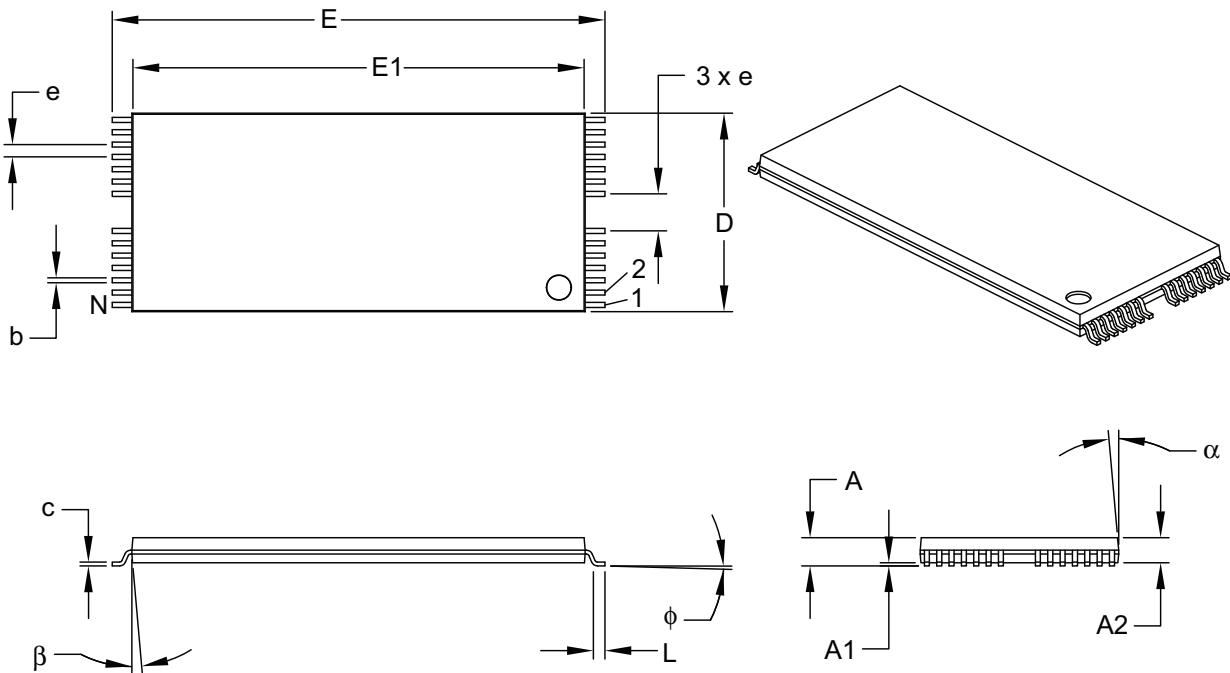
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

28-Lead Plastic Thin Small Outline (TS) – 8x20 mm [TSOP]

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 Pins		N	28		
Pitch		e	0.50		
Overall Height		A	0.99	1.14	1.30
Molded Package Thickness		A2	0.95	1.00	1.05
Standoff §		A1	0.05	0.15	0.25
Overall Width		E	19.80	20.00	20.20
Molded Package Width		E1	18.30	18.40	18.50
Molded Package Length		D	7.80	8.00	8.20
Foot Length		L	0.50	0.60	0.70
Foot Angle		phi	0°	4°	8°
Lead Thickness		c	0.10	0.15	0.20
Lead Width		b	0.15	0.20	0.25
Mold Draft Angle Top		alpha	0°	5°	10°
Mold Draft Angle Bottom		beta	0°	5°	10°

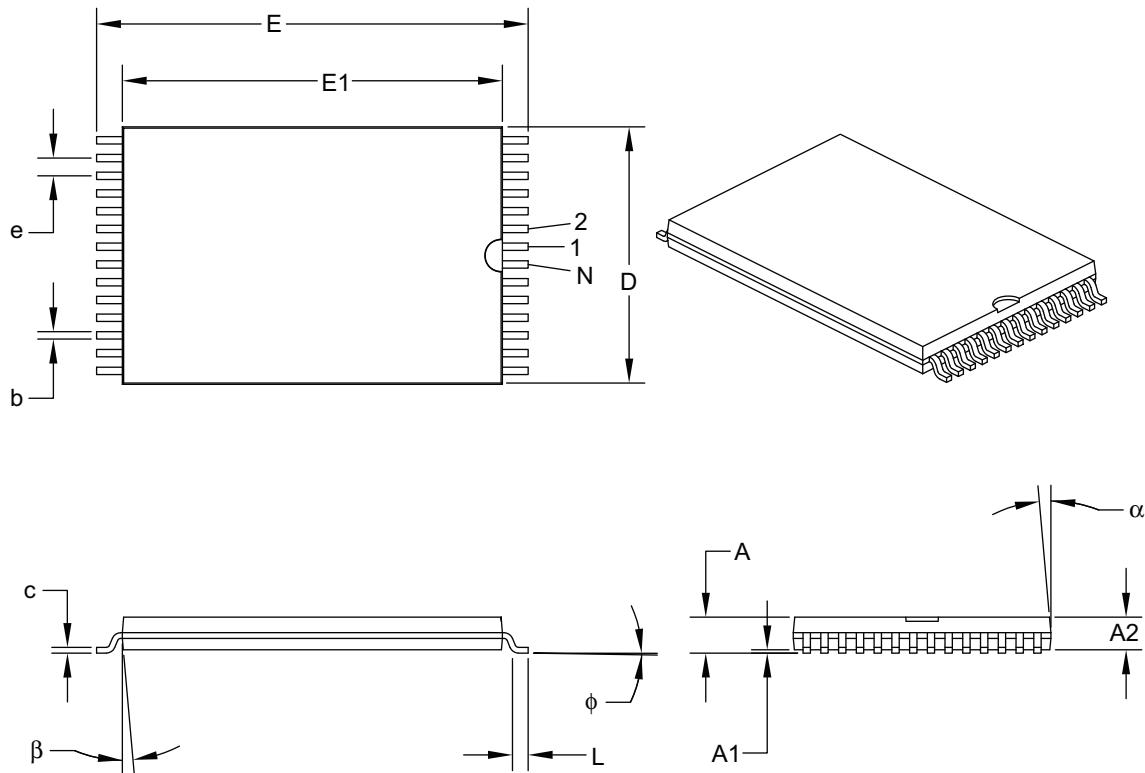
Notes:

- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- § Significant Characteristic.

Packaging Diagrams and Parameters

28-Lead Plastic Very Small Outline (VS) – 8x13.4 mm Body [VSOP]

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 Pins	N		28	
Pitch	e		0.55	
Overall Height	A	0.99	1.14	1.29
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff §	A1	0.05	0.13	0.25
Overall Width	E	13.20	13.40	13.60
Molded Package Width	E1	11.70	11.80	11.90
Molded Package Length	D	7.90	8.00	8.10
Foot Length	L	0.30	0.50	0.70
Foot Angle	phi	0°	3°	5°
Lead Thickness	c	0.14	0.15	0.16
Lead Width	b	0.17	0.20	0.23
Mold Draft Angle Top	alpha	0°	5°	10°
Mold Draft Angle Bottom	beta	0°	5°	10°

Notes:

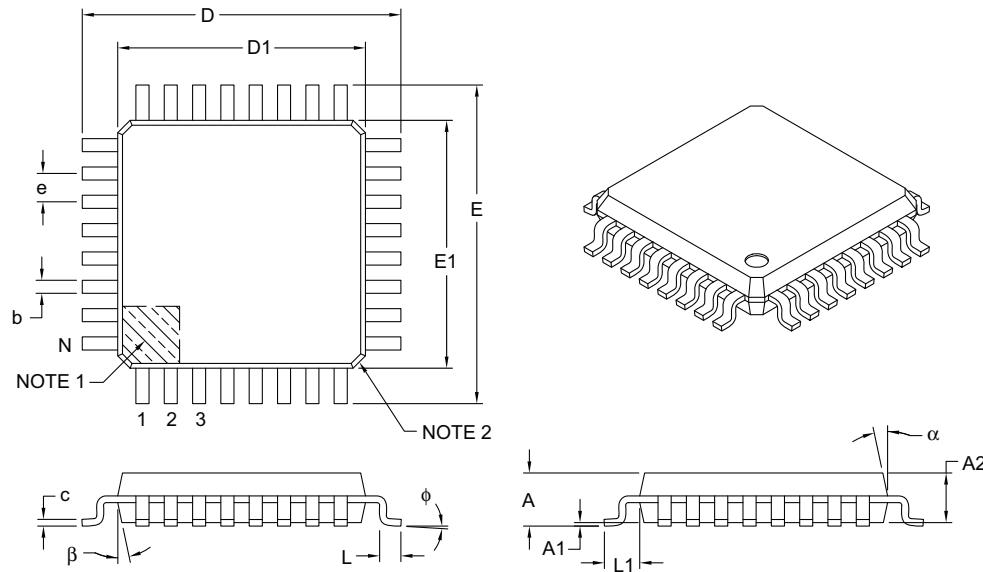
- § Significant Characteristic.
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.

Microchip Technology Drawing C04-075B

Packaging Diagrams and Parameters

32-Lead Plastic Low-Profile Quad Flatpack (PL) – 7x7x1.4 mm Body, 2.0 mm [LQFP]

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 Leads	N		32		
Lead Pitch	e		0.80 BSC		
Overall Height	A	—	—	1.60	
Molded Package Thickness	A2	1.35	1.40	1.45	
Standoff	A1	0.05	—	0.15	
Foot Length	L	0.45	0.60	0.75	
Footprint	L1		1.00 REF		
Foot Angle	ϕ	0°	3.5°	7°	
Overall Width	E		9.00 BSC		
Overall Length	D		9.00 BSC		
Molded Package Width	E1		7.00 BSC		
Molded Package Length	D1		7.00 BSC		
Lead Thickness	c	0.09	—	0.20	
Lead Width	b	0.30	0.37	0.45	
Mold Draft Angle Top	α	11°	12°	13°	
Mold Draft Angle Bottom	β	11°	12°	13°	

Notes:

- Pin 1 visual index feature may vary, but must be located within the hatched area.
- Chamfers at corners are optional; size may vary.
- Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

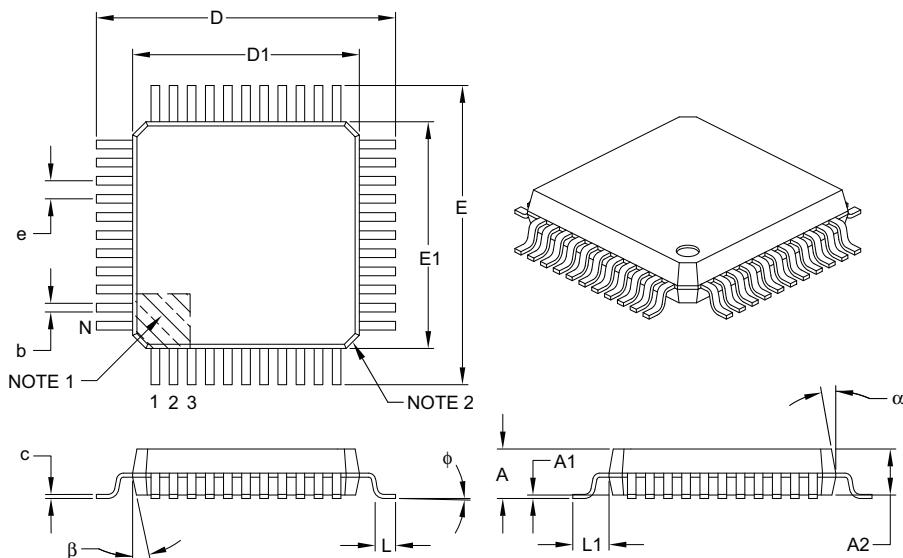
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

44-Lead Plastic Metric Quad Flatpack (PQ) – 10x10x2 mm Body, 3.20 mm [MQFP]

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



	Dimension Limits	MILLIMETERS		
		MIN	NOM	MAX
Number of Leads	N		44	
Lead Pitch	e		0.80 BSC	
Overall Height	A	–	–	2.45
Molded Package Thickness	A2	1.80	2.00	2.20
Standoff §	A1	0.00	–	0.25
Foot Length	L	0.73	0.88	1.03
Footprint	L1	1.60 REF		
Foot Angle	φ	0°	–	7°
Overall Width	E	13.20 BSC		
Overall Length	D	13.20 BSC		
Molded Package Width	E1	10.00 BSC		
Molded Package Length	D1	10.00 BSC		
Lead Thickness	c	0.11	–	0.23
Lead Width	b	0.29	–	0.45
Mold Draft Angle Top	α	5°	–	16°
Mold Draft Angle Bottom	β	5°	–	16°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

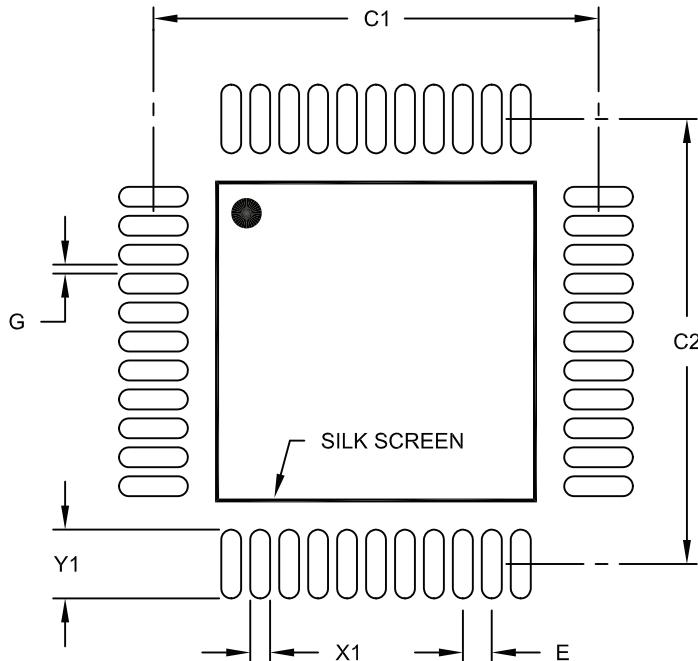
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. § Significant Characteristic.

Land Pattern (Footprint)

44-Lead Plastic Metric Quad Flatpack (PQ) – 10x10x2 mm Body, 3.20 mm [MQFP]

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		0.80	BSC	
Contact Pad Spacing	C1			12.30	
Contact Pad Spacing	C2			12.30	
Contact Pad Width (X44)	X1				0.55
Contact Pad Length (X44)	Y1				1.90
Distance Between Pads	G	0.25			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

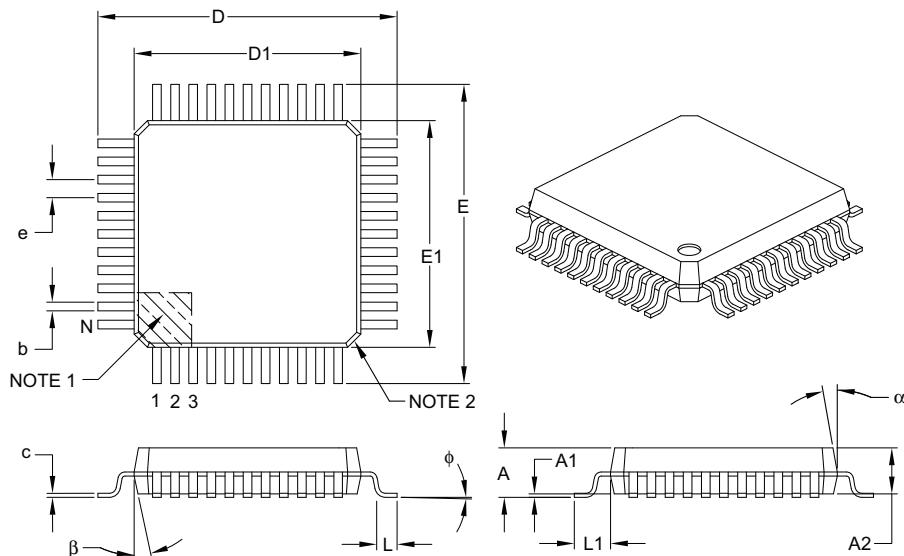
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2071A

Packaging Diagrams and Parameters

44-Lead Plastic Metric Quad Flatpack (KW) – 10x10x2 mm Body, 3.20 mm [MQFP]

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 Leads	N				44		
Lead Pitch	e				0.80	BSC	
Overall Height	A		—	—	2.45		
Molded Package Thickness	A2	1.80		2.00	2.20		
Standoff §	A1	0.00		—	0.25		
Foot Length	L	0.73		0.88	1.03		
Footprint	L1		1.60 REF				
Foot Angle	φ	0°		—	7°		
Overall Width	E		13.20 BSC				
Overall Length	D		13.20 BSC				
Molded Package Width	E1		10.00 BSC				
Molded Package Length	D1		10.00 BSC				
Lead Thickness	c	0.11		—	0.23		
Lead Width	b	0.29		—	0.45		
Mold Draft Angle Top	α	5°		—	16°		
Mold Draft Angle Bottom	β	5°		—	16°		

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. 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.

5. § Significant Characteristic.

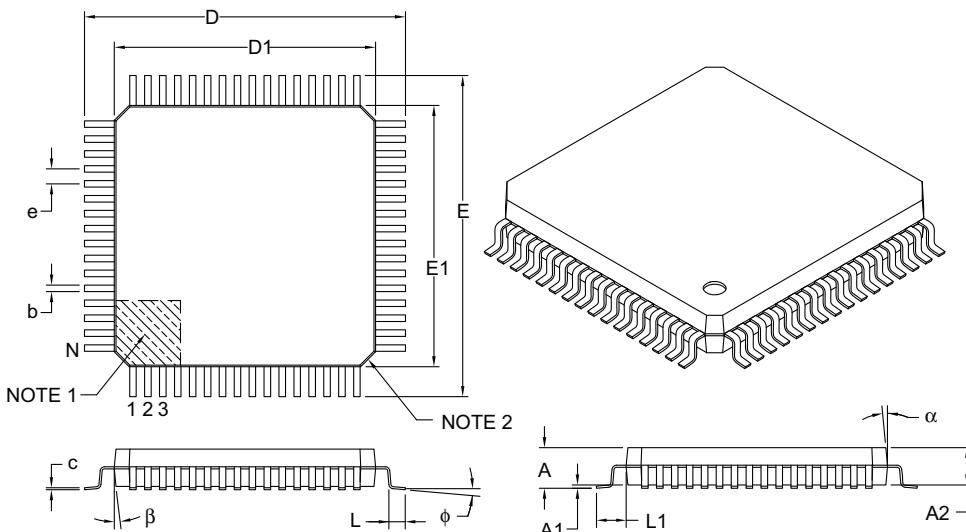
Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

64-Lead Plastic Metric Quad Flatpack (BU) – 14x14x2.7 mm Body, 3.20 mm [MQFP]

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 Leads	N		64		
Lead Pitch	e		0.80	BSC	
Overall Height	A	—	—	3.15	
Molded Package Thickness	A2	2.50	2.70	2.90	
Standoff §	A1	0.00	—	0.25	
Overall Width	E	17.20	BSC		
Molded Package Width	E1	14.00	BSC		
Overall Length	D	17.20	BSC		
Molded Package Length	D1	14.00	BSC		
Foot Length	L	0.73	0.88	1.03	
Footprint	L1	1.60 REF			
Foot Angle	ϕ	0°	—	7°	
Lead Thickness	c	0.11	—	0.23	
Lead Width	b	0.29	—	0.45	
Mold Draft Angle Top	α	5°	—	16°	
Mold Draft Angle Bottom	β	5°	—	16°	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. 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.

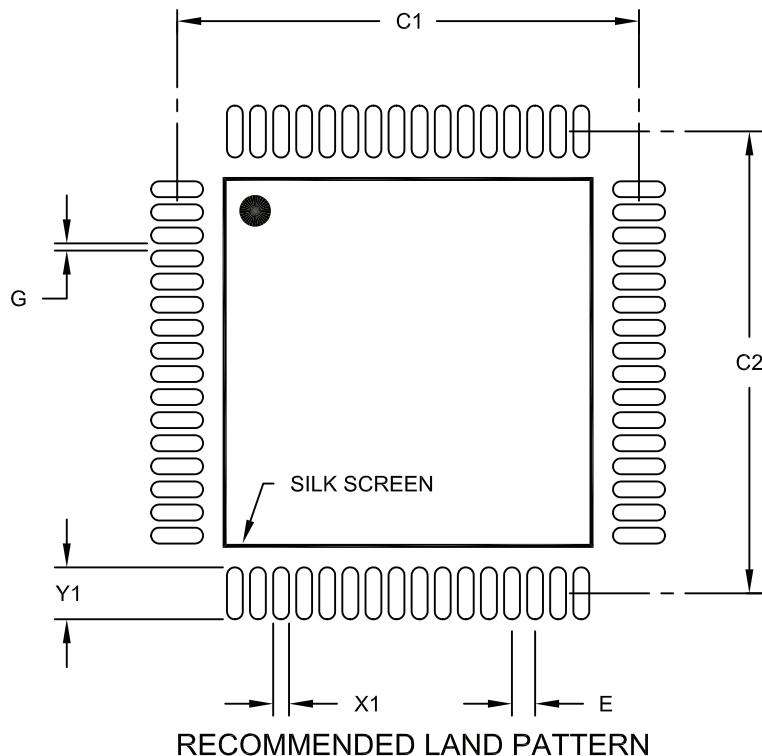
5. § Significant Characteristic.

6. Formerly TelCom PQFP package.

Land Pattern (Footprint)

64-Lead Plastic Metric Quad Flatpack (BU) – 14x14x2.7 mm Body, 3.20 mm [MQFP]

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
Contact Pitch	E		0.80	BSC	
Contact Pad Spacing	C1		16.10		
Contact Pad Spacing	C2		16.10		
Contact Pad Width (X64)	X1			0.55	
Contact Pad Length (X64)	Y1				1.80
Distance Between Pads	G	0.25			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2022A



MICROCHIP

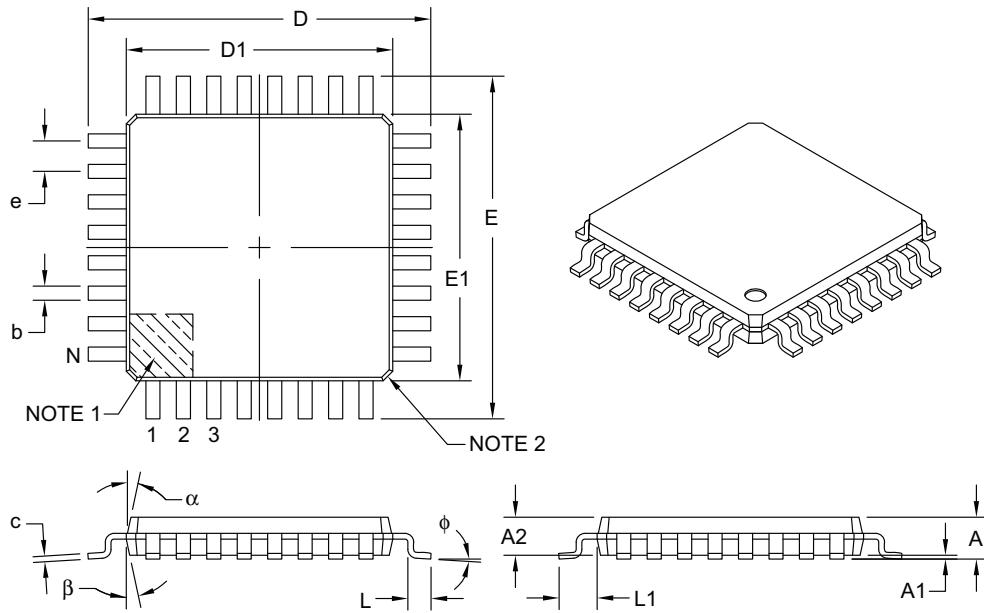
Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

32-Lead Plastic Thin Quad Flatpack (PT) – 7x7x1.0 mm Body, 2.00 mm [TQFP]

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 Leads		N		
Lead Pitch		e		
Overall Height		A		
Standoff		A1		
Molded Package Thickness		A2		
Foot Length		L		
Footprint		L1		
Foot Angle		phi		
Overall Width		E		
Overall Length		D		
Molded Package Width		E1		
Molded Package Length		D1		
Lead Thickness		c		
Lead Width		b		
Mold Draft Angle Top		alpha		
Mold Draft Angle Bottom		beta		

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

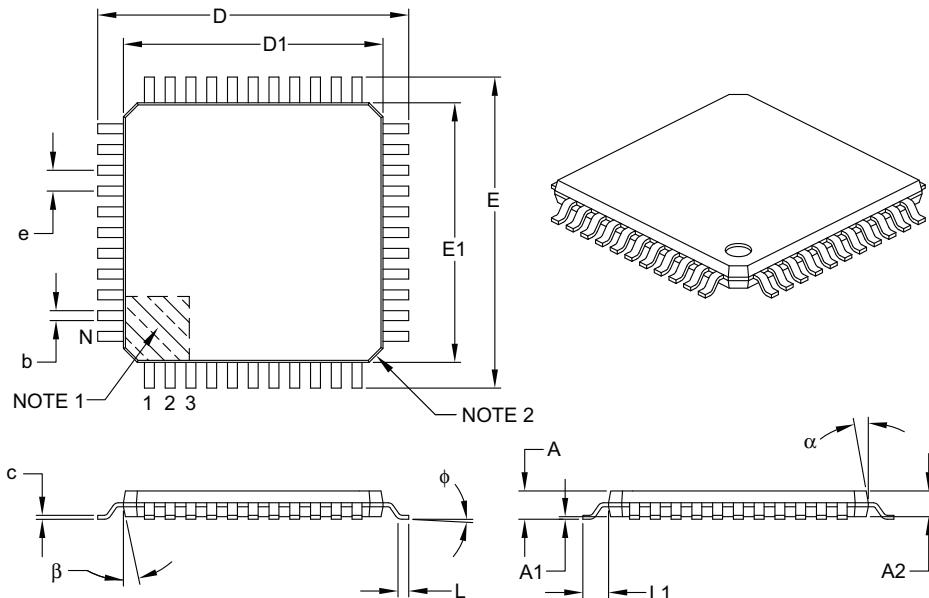
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-074B

Packaging Diagrams and Parameters

44-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

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 Leads	N			44	
Lead Pitch	e			0.80 BSC	
Overall Height	A		–	–	1.20
Molded Package Thickness	A2		0.95	1.00	1.05
Standoff	A1		0.05	–	0.15
Foot Length	L		0.45	0.60	0.75
Footprint	L1		1.00 REF		
Foot Angle	phi		0°	3.5°	7°
Overall Width	E		12.00 BSC		
Overall Length	D		12.00 BSC		
Molded Package Width	E1		10.00 BSC		
Molded Package Length	D1		10.00 BSC		
Lead Thickness	c		0.09	–	0.20
Lead Width	b		0.30	0.37	0.45
Mold Draft Angle Top	alpha		11°	12°	13°
Mold Draft Angle Bottom	beta		11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

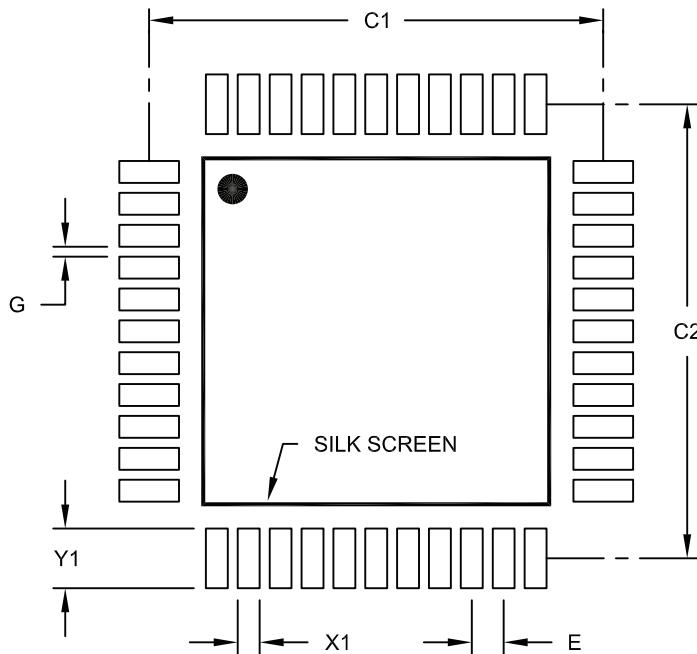
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-076B

Land Pattern (Footprint)

44-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

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		0.80	BSC	
Contact Pad Spacing	C1		11.40		
Contact Pad Spacing	C2		11.40		
Contact Pad Width (X44)	X1			0.55	
Contact Pad Length (X44)	Y1			1.50	
Distance Between Pads	G	0.25			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

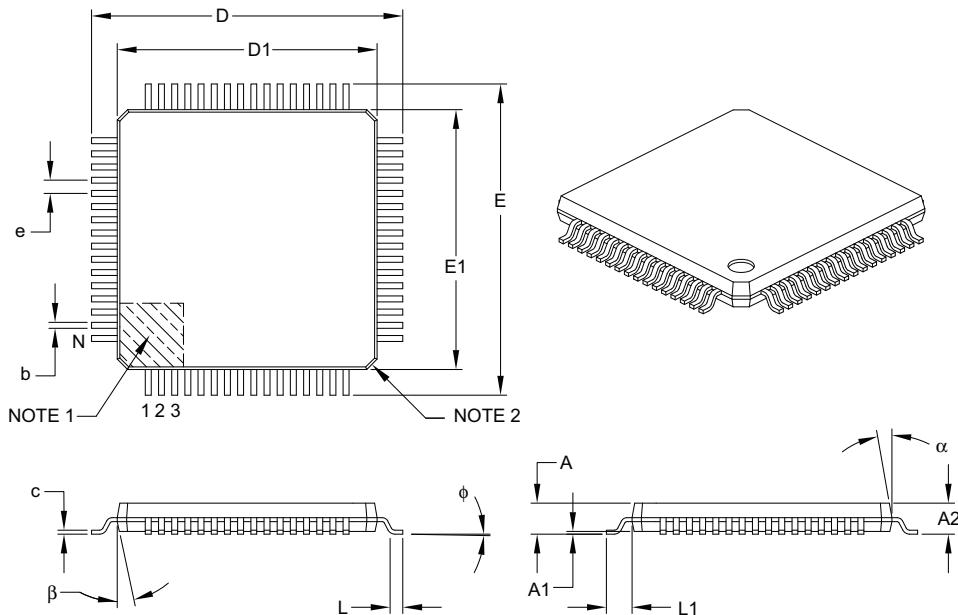
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2076A

Packaging Diagrams and Parameters

64-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

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 Leads		64		
Lead Pitch		0.50 BSC		
Overall Height		A	–	1.20
Molded Package Thickness		A2	0.95	1.00
Standoff		A1	0.05	–
Foot Length		L	0.45	0.60
Footprint		L1	1.00 REF	
Foot Angle		ϕ	0°	3.5°
Overall Width		E	12.00 BSC	
Overall Length		D	12.00 BSC	
Molded Package Width		E1	10.00 BSC	
Molded Package Length		D1	10.00 BSC	
Lead Thickness		c	0.09	–
Lead Width		b	0.17	0.22
Mold Draft Angle Top		α	11°	12°
Mold Draft Angle Bottom		β	11°	12°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

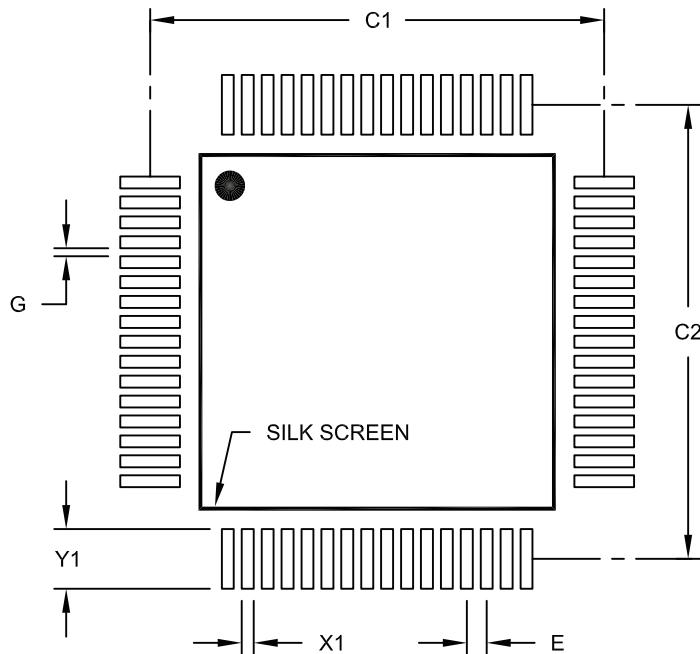
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-085B

Land Pattern (Footprint)

64-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

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		0.50	BSC	
Contact Pad Spacing	C1			11.40	
Contact Pad Spacing	C2			11.40	
Contact Pad Width (X64)	X1				0.30
Contact Pad Length (X64)	Y1				1.50
Distance Between Pads	G	0.20			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

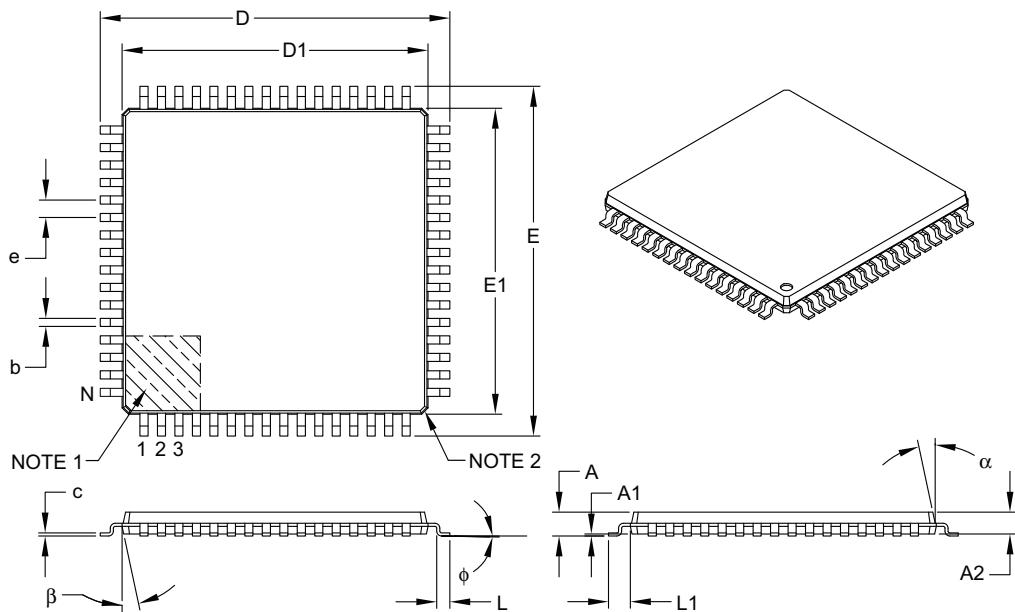
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2085A

Packaging Diagrams and Parameters

64-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

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



Dimension Limits		MILLIMETERS		
		MIN	NOM	MAX
Number of Leads	N	64		
Lead Pitch	e	0.80	BSC	
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	phi	0°	3.5°	7°
Overall Width	E	16.00 BSC		
Overall Length	D	16.00 BSC		
Molded Package Width	E1	14.00 BSC		
Molded Package Length	D1	14.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.30	0.37	0.45
Mold Draft Angle Top	alpha	11°	12°	13°
Mold Draft Angle Bottom	beta	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

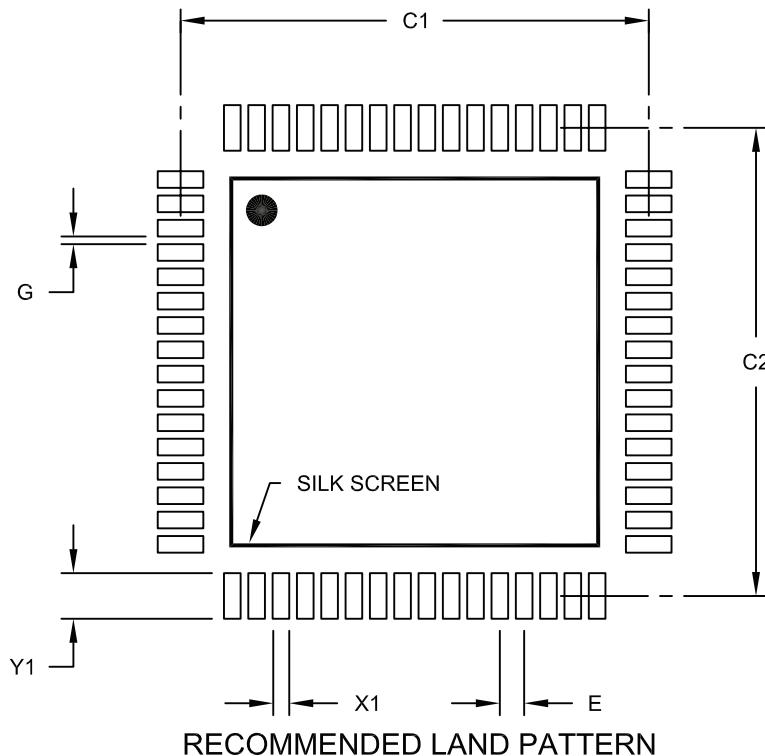
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-066B

Land Pattern (Footprint)

64-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

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		
Contact Pitch	E			0.80	BSC		
Contact Pad Spacing	C1			15.40			
Contact Pad Spacing	C2			15.40			
Contact Pad Width (X64)	X1				0.55		
Contact Pad Length (X64)	Y1					1.50	
Distance Between Pads	G	0.25					

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

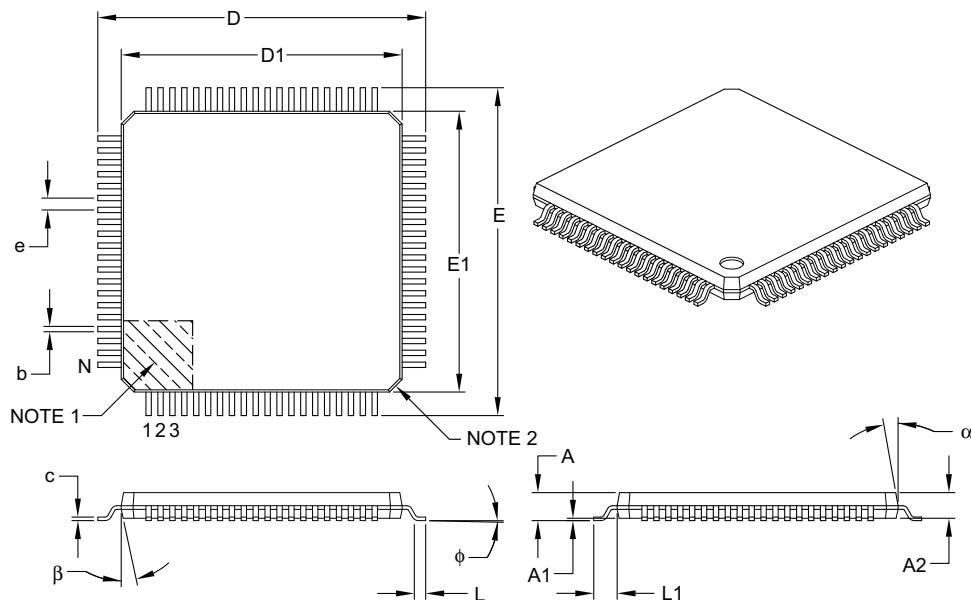
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2066A

Packaging Diagrams and Parameters

80-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

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 Leads	N		80		
Lead Pitch	e		0.50	BSC	
Overall Height	A	–	–	1.20	
Molded Package Thickness	A2	0.95	1.00	1.05	
Standoff	A1	0.05	–	0.15	
Foot Length	L	0.45	0.60	0.75	
Footprint	L1	1.00 REF			
Foot Angle	phi	0°	3.5°	7°	
Overall Width	E	14.00 BSC			
Overall Length	D	14.00 BSC			
Molded Package Width	E1	12.00 BSC			
Molded Package Length	D1	12.00 BSC			
Lead Thickness	c	0.09	–	0.20	
Lead Width	b	0.17	0.22	0.27	
Mold Draft Angle Top	alpha	11°	12°	13°	
Mold Draft Angle Bottom	beta	11°	12°	13°	

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

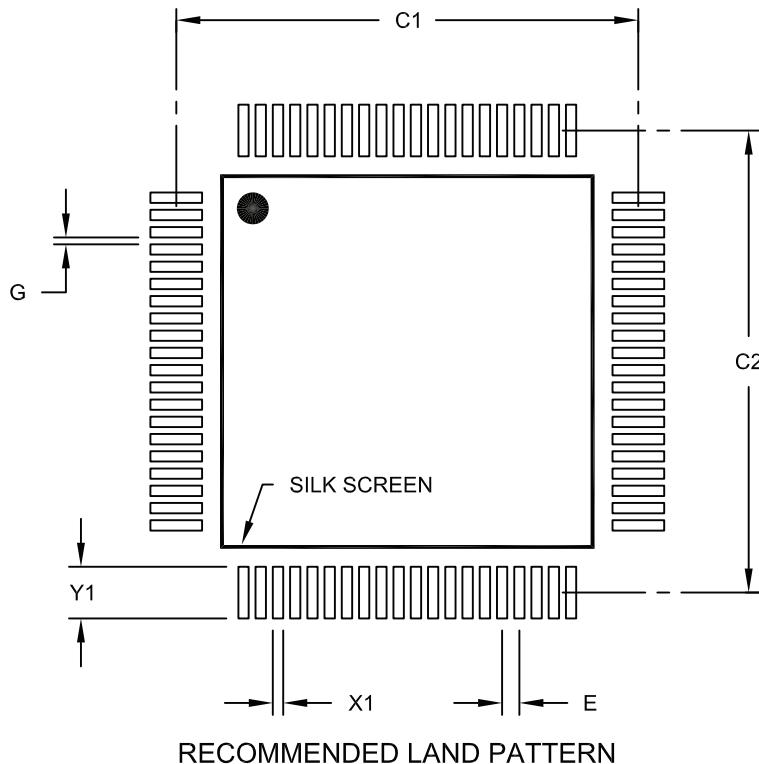
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

80-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

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
Contact Pitch	E		0.50	BSC	
Contact Pad Spacing	C1			13.40	
Contact Pad Spacing	C2			13.40	
Contact Pad Width (X80)	X1			0.30	
Contact Pad Length (X80)	Y1			1.50	
Distance Between Pads	G	0.20			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

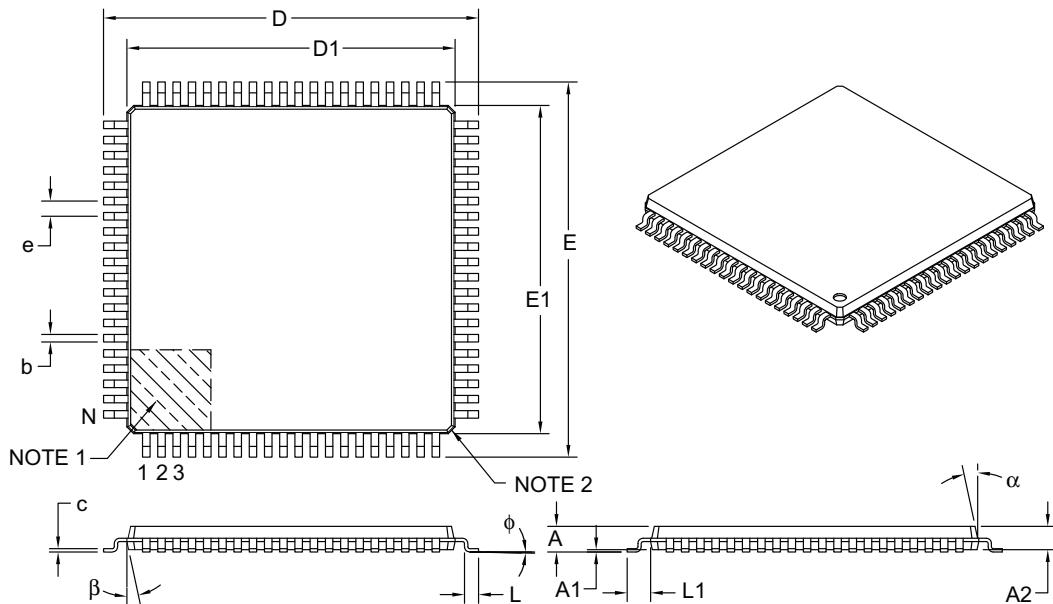
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2092A

Packaging Diagrams and Parameters

80-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

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



Dimension Limits		MILLIMETERS		
		MIN	NOM	MAX
Number of Leads	N	80		
Lead Pitch	e	0.65	BSC	
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	phi	0°	3.5°	7°
Overall Width	E	16.00 BSC		
Overall Length	D	16.00 BSC		
Molded Package Width	E1	14.00 BSC		
Molded Package Length	D1	14.00 BSC		
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.22	0.32	0.38
Mold Draft Angle Top	alpha	11°	12°	13°
Mold Draft Angle Bottom	beta	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

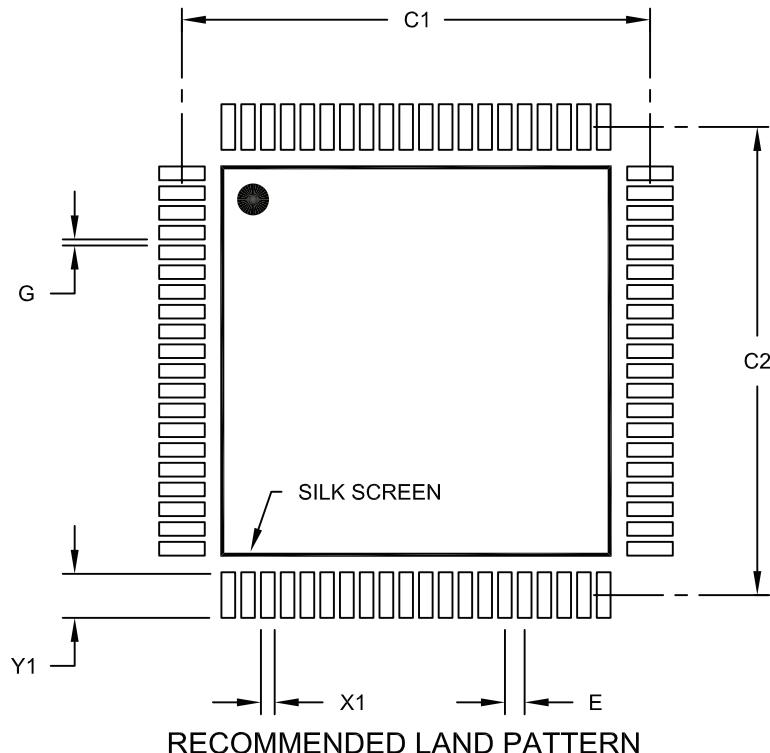
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-116B

Land Pattern (Footprint)

80-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm Footprint [TQFP]

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
Contact Pitch	E		0.65	BSC	
Contact Pad Spacing	C1		15.40		
Contact Pad Spacing	C2		15.40		
Contact Pad Width (X80)	X1			0.45	
Contact Pad Length (X80)	Y1			1.50	
Distance Between Pads	G	0.20			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

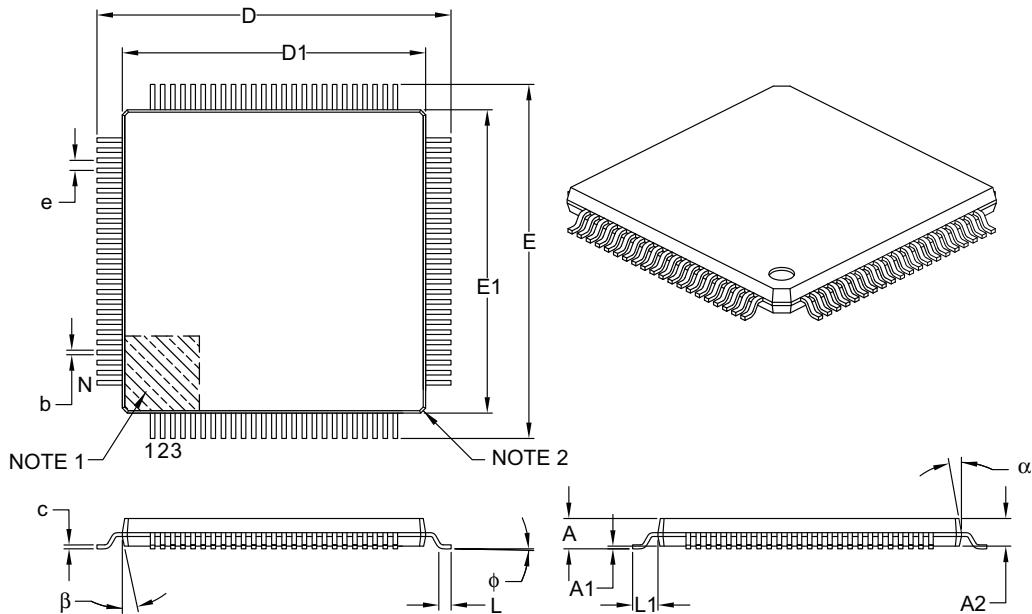
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2116B

Packaging Diagrams and Parameters

100-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

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 Leads	N		100		
Lead Pitch	e		0.40	BSC	
Overall Height	A		–	–	1.20
Molded Package Thickness	A2		0.95	1.00	1.05
Standoff	A1		0.05	–	0.15
Foot Length	L		0.45	0.60	0.75
Footprint	L1		1.00 REF		
Foot Angle	φ		0°	3.5°	7°
Overall Width	E		14.00 BSC		
Overall Length	D		14.00 BSC		
Molded Package Width	E1		12.00 BSC		
Molded Package Length	D1		12.00 BSC		
Lead Thickness	c		0.09	–	0.20
Lead Width	b		0.13	0.18	0.23
Mold Draft Angle Top	α		11°	12°	13°
Mold Draft Angle Bottom	β		11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

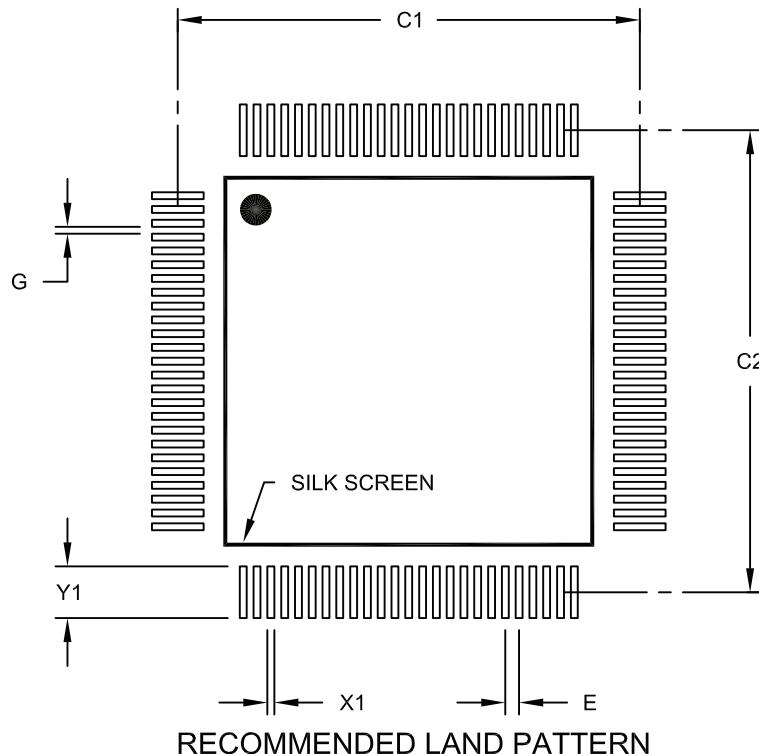
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-100B

Land Pattern (Footprint)

100-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

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
Contact Pitch	E		0.40	BSC	
Contact Pad Spacing	C1			13.40	
Contact Pad Spacing	C2			13.40	
Contact Pad Width (X100)	X1				0.20
Contact Pad Length (X100)	Y1				1.50
Distance Between Pads	G	0.20			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

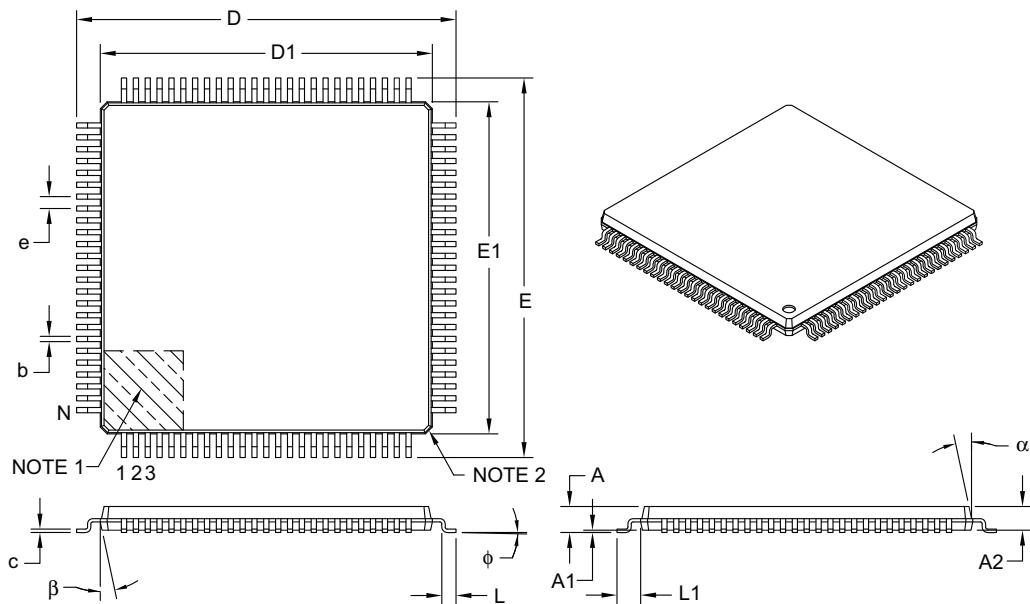
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2100A

Packaging Diagrams and Parameters

100-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

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 Leads	N	100		
Lead Pitch	e	0.50	BSC	
Overall Height	A	–	–	1.20
Molded Package Thickness	A2	0.95	1.00	1.05
Standoff	A1	0.05	–	0.15
Foot Length	L	0.45	0.60	0.75
Footprint	L1	1.00 REF		
Foot Angle	φ	0°	3.5°	7°
Overall Width	E	16.00	BSC	
Overall Length	D	16.00	BSC	
Molded Package Width	E1	14.00	BSC	
Molded Package Length	D1	14.00	BSC	
Lead Thickness	c	0.09	–	0.20
Lead Width	b	0.17	0.22	0.27
Mold Draft Angle Top	α	11°	12°	13°
Mold Draft Angle Bottom	β	11°	12°	13°

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Chamfers at corners are optional; size may vary.
3. Dimensions D1 and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

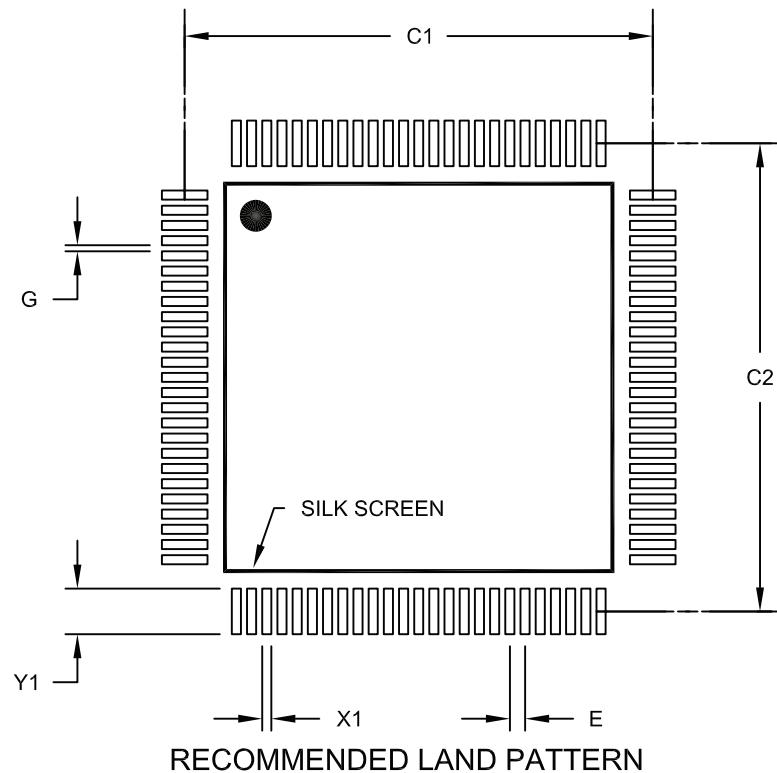
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-110B

Land Pattern (Footprint)

100-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

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
Contact Pitch	E		0.50	BSC	
Contact Pad Spacing	C1		15.40		
Contact Pad Spacing	C2		15.40		
Contact Pad Width (X100)	X1			0.30	
Contact Pad Length (X100)	Y1				1.50
Distance Between Pads	G	0.20			

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

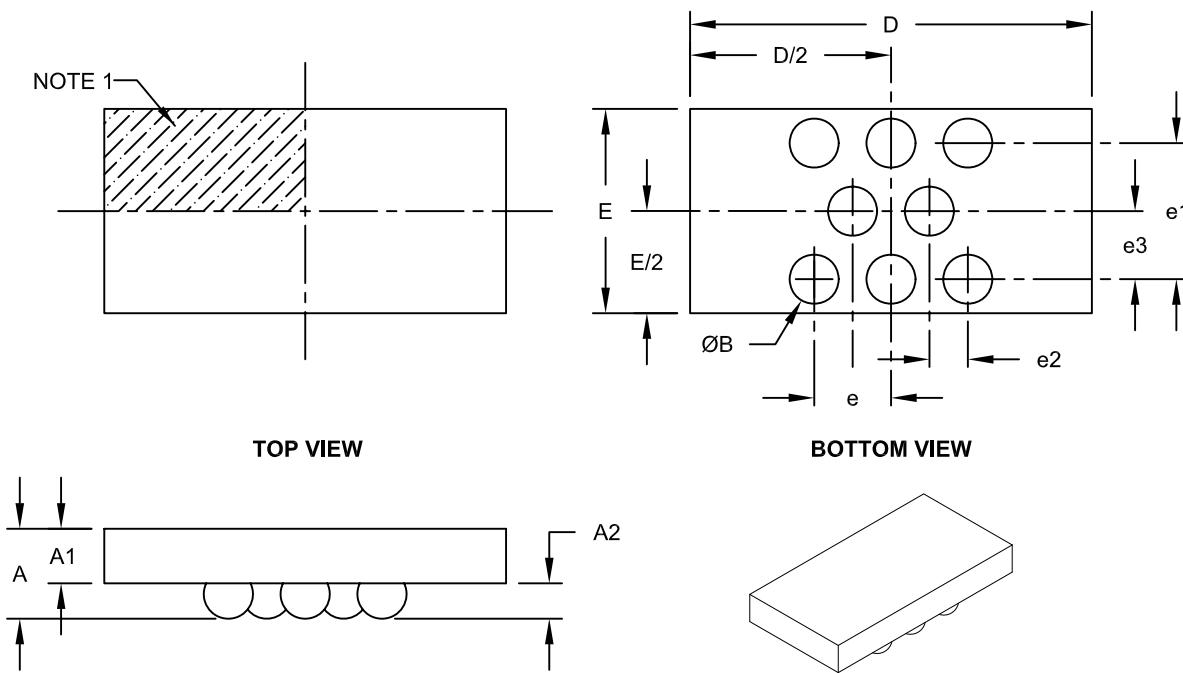
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2110A

Packaging Diagrams and Parameters

8-Lead Chip Scale Package (CS) – 3x2x3 Ball Pattern [CSP]

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 Contacts	N		8				
X-Pitch	e		0.50				
Overall Grid Y-Pitch	e ₁		0.886				
Adjacent Column X-Pitch	e ₂		0.25				
Adjacent Row Y-Pitch	e ₃		0.443				
Overall Height	A	0.535	0.585	0.635			
Encapsulated Package Height	A ₁	0.330	0.355	0.380			
Contact Thickness	A ₂	0.205	0.230	0.255			
Overall Width	E	NOTE 4					
Edge to Center of Array	E/2	NOTE 4					
Overall Length	D	NOTE 4					
Edge to Center of Array	D/2	NOTE 4					
Contact Diameter	B	0.29	0.32	0.35			

Notes:

1. Orientation reference 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.

4. Package size varies with specific devices. Please see the specific Product Data Sheet.



MICROCHIP

Overview of Microchip Die/Wafer Support

INTRODUCTION

In addition to packaged devices, Microchip Technology Inc. devices are available in wafer and die form. All products sold in die or wafers have been characterized and qualified according to the requirements of Microchip Technology Inc. Specifications SPI-41014, "Characterization and Qualification of Integrated Circuits" and QCI-39000, "Worldwide Quality Conformance Requirements".

PRODUCT INTEGRITY

Product supplied in die or wafer form is fully tested and characterized. Die and wafers are inspected to Microchip Technology Inc. Specification, QCI-30014.

CAUTION

Some EEPROM devices use EEPROM cells for device configuration. Exposure to ultraviolet light must be avoided. Exposure to ultraviolet light may cause the device to operate improperly.

Extreme care is urged in the handling and assembly of these products since they are susceptible to damage from electro-static discharge.

PACKAGING OPTIONS

Die/wafer products are available as individual Die in Waffle Pack, Whole Wafers or as Sawn Wafer on Frame. As a standard, all die on a wafer are tested and Ink Dots are used to indicate the bad die on a wafer. Inkless wafers with electronic wafer maps are also available upon request. To acquire individual electronic wafer maps, customers can request a password-protected account on a Microchip FTP site where their wafer maps are stored and easily downloaded.

Various wafer thicknesses are available, which include 8, 11, 15 and 29 mils for unground wafers. Standard wafer thickness varies from product to product, so contact your Microchip Sales Office for details.

ORDERING INFORMATION

Die sales must be initiated by contacting your Microchip Sales Office. To order or to obtain information (on pricing or delivery) for a specific device, use one of the following part numbers.

Standard Thickness Die/Wafer

DEVICE_NUMBER/S	Die in Waffle Pack
DEVICE_NUMBER/W	Whole Wafers
DEVICE_NUMBER/WF	Sawn Wafer on Frame

EEPROM Examples

24LC01B-I/S
24LC01B-I/W
24LC01B-I/WF

No Backgrind Wafers

DEVICE_NUMBER/WN BG	Whole Wafers with Ink	24LC01B-I/WN BG
DEVICE_NUMBER/WN BI	Whole Wafers without Ink	24LC01B-I/WN BI

Standard Die/Wafers with Manufacturing Process Included in Part Number

DEVICE_NUMBER/SXXX	Die in Waffle Pack	24LC01B-I/S15K
DEVICE_NUMBER/WXXX	Whole Wafers	24LC01B-I/W15K
DEVICE_NUMBER/WFXXX	Sawn Wafer on Frame	24LC01B-I/WF15K

DEVICE_NUMBER is the base part number of the device that you require, the S specifies Die in Waffle Pack, a W specifies a Whole Wafer and WF specifies Sawn Wafer on Frame. Whole wafers specified as NBG are shipped as inked wafers with no backgrind (29 mils) and those specified as NBI are shipped with no backgrind and without Ink.

As further clarification, the manufacturing process is sometimes indicated with a three digit suffix added at the end of the part number. For example, a wafer from the 160K process will use the suffix 16K, one from the 150K process will use 15K and one from the 121K process will use 12K.

ELECTRICAL SPECIFICATIONS

The functional and electrical specifications of Microchip devices in die form are identical to those of a packaged version. Please refer to individual data sheets for complete details.

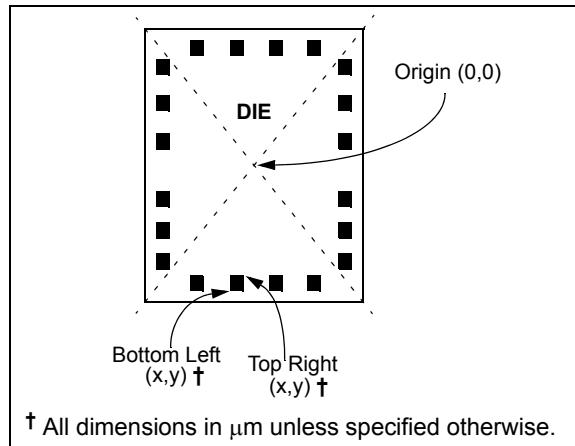
DIE MECHANICAL SPECIFICATIONS

Refer to the individual data sheet for these specifications.

BOND PAD COORDINATES

The die figures have associated bond pad coordinates. These coordinates assist in the attaching of the bond wire to the die. All the dimensions of these coordinates are in micrometers (μm) unless otherwise specified. The origin for the coordinates is the center of the die, as shown in Figure 1. Refer to the specific die data sheet for each device for openings and pitch.

FIGURE 1: DIE COORDINATE ORIGIN



† All dimensions in μm unless specified otherwise.

The die is capable of thermosonic gold or ultrasonic wire bonding. Die meet the minimum conditions of MIL-STD 883, Method 2011 on "Bond Strength (Destructive Bond Pull Test)". The Bond Pad metallization is silicon doped aluminum.

SUBSTRATE BONDING

Substrate bonding may be required on certain product families. For more information, refer to the specific die data sheet for that product.

SHIPPING OPTIONS

Die Form (/S)

Microchip product in die form can be shipped in waffle pack. The waffle pack has sufficient cavity area to restrain the die, while maintaining their orientation. Lint free paper inserts are placed over the waffle packs, and each pack is secured with a plastic locking clip. Groups of waffle packs are assembled into sets for shipment. A label with lot number, quantity and part number is attached.

These waffle packs are hermetically sealed in bags.

Wafer Form (/W)

Products may also be shipped in wafer form (see ordering information). Wafers are uncut and shipped in a wafer tub. The tub is padded with non-conductive foam. Lint free paper inserts are placed around each wafer. A label with lot number, quantity and part number is attached.

Sawn Wafer on Frames (/WF)

Products may also be shipped on wafer frames. Wafers are mounted on plastic frames and 100% sawn through. Sawn wafer on frames may be shipped in bulk (25 wafers per carrier) or as a single wafer in a carrier. A label with lot number, quantity and part number is attached with each shipment.

Storage Procedures

Temperature and humidity greatly affect the storage life of die. It is recommended that the die be used as soon as possible after receipt.

Upon receipt, the sealed bags should be stored in a cool and dry environment (25°C and 25% relative humidity). In these conditions, sealed bags have a shelf life of 12 months. Temperatures or humidities greater than these will reduce the storage life.

Once a bag containing waffle packs has been opened, the devices should be assembled and encapsulated within 48 hours (assuming 25°C and 25% humidity).

APPENDIX A: REVISION HISTORY

Revision AE (September 2005)

The following is the list of modifications:

1. Added **Appendix A: Revision History**.
2. Revised dimensions D2 and E2 in the 8-Lead Plastic, No Lead (MC) 2x3x0.9 mm body (DFN) – Saw Singulated package diagram
3. Corrected graphic format in all packaging diagrams.
4. Added the following Packages:
 - 16-Lead Plastic Small Outline Narrow Body (QSOP)
 - 4-Lead Plastic Small Outline Transistor (SOT-143)
 - 3-Lead Plastic Small Outline Transistor (SOT-223)
 - 32-Lead Thin Quad Flatpack 7x7x1mm Body 1.0/0.10 Lead Form (TQFP)
 - 3-Lead SC-70 package diagram corrected.
5. The following package diagrams were replaced:
 - Drawing C04-142 replaced by C04-128 (5-Lead Small Outline Transistor) (TSOT)
 - Drawing C04-300 replaced by C04-132 (24-Lead Plastic Shrink Small Outline) (SSOP)
6. Added Part Number Designators DB, RC and QR to Part Number Suffix Designations table.

Revision AF (January 2006)

The following is the list of modifications:

1. Revised 28-Lead Plastic Shrink Small Outline (SS) – 209 mil body, 5.30 mm (SSOP)
2. Revised 28-Lead Plastic Quad Flat No Lead (MM) 6x6x0.9 mm body (QFN-S) with 0.40 mm Contact Length (Saw Singulated)

Revision AG (July 2006)

The following is the list of modifications:

1. Revised 8-Lead Plastic Thin Shrink Small Outline (ST) – 4.4 mm (TSSOP)
2. Added 40-Lead Plastic Quad Flat, No Lead (MM) 6x6x0.9 mm Body (QFN) with 0.40 mm Contact Length (Saw Singulated)
3. Added 3-Lead Plastic Transistor Outline (AB) (TO-220)
4. Removed Drawing No. C04-300 as it does not exist.
5. Revised 28-Lead Plastic Shrink Small Outline (SS) – 209 mil Body, 5.30 mm (SSOP)
6. Revised 20-Lead Plastic Shrink Small Outline (SS) – 209 mil Body, 5.30 mm (SSOP)

7. Revised 14-Lead Plastic Small Outline (SL) – Narrow, 150 mil (SOIC)
8. Revised 64-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 1.0/0.10 mm Lead Form (TQFP)
9. Revised 80-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 1.0/0.10 mm Lead Form (TQFP)
10. Revised Part Number Suffix Designations

Revision AH (August 2006)

The following is the list of modifications:

1. Revised 28-Lead Plastic Quad Flat No Lead (ML) 6x6 mm Body (QFN) with 0.55 mm Contact Length (Saw Singulated)

Revision AJ (September 2006)

The following is the list of modifications:

1. Revised 8-Lead Plastic Dual Flat, No Lead Package (MC) - 2x3x0.9 mm Body [DFN]
2. Revised 8-Lead Plastic Dual Flat, No Lead Package (MF) - 6x5 mm Body (DFN-S) – Punch Singulated
3. Revised 8-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9 mm Body [DFN]
4. Revised 8-Lead Plastic Dual Flat, No Lead Package (MD) - 4x4x0.9 mm Body [DFN]
5. Revised 8-Lead Plastic Dual Flat, No Lead Package (MF) - 6x5 mm Body [DFN-S]
6. Revised 10-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9 mm Body [DFN]
7. Revised 16-Lead Plastic Quad Flat, No Lead Package (ML) - 4x4x0.9 mm Body [QFN]
8. Revised 20-Lead Plastic Quad Flat, No Lead Package (ML) - 4x4x0.9 mm Body [QFN]
9. Revised 28-Lead Plastic Quad Flat, No Lead Package (ML) - 6x6 mm Body [QFN] With 0.55 mm Contact Length
10. Revised 28-Lead Plastic Quad Flat, No Lead Package (MM) - 6x6x0.9 mm Body [QFN-S] With 0.40 mm Contact Length
11. Revised 40-Lead Plastic Quad Flat, No Lead Package (MM) 6x6x0.9 mm Body [QFN] With 0.40 mm Contact Length
12. Revised 44-Lead Plastic Quad Flat, No Lead Package (ML) - 8x8 mm Body [QFN]
13. Revised 8-Lead Plastic Micro Small Outline Package (MS) [MSOP]
14. Revised 10-Lead Plastic Micro Small Outline Package (MS) [MSOP]

Revision AK (January 2007)

The entire Packaging Specification has been updated.

Packaging

Revision AL (February 2007)

Packages were revised. Telcom package designators were added where the designators vary from Microchip designators.

1. Revised 3-Lead Plastic Transistor Outline (TO or ZB) [TO-92]
2. Revised 3-Lead Plastic Small Outline Transistor (TT or NB) [SOT-23]
3. Revised 3-Lead Plastic Small Outline Transistor (CB or NB) [SOT-23A]
4. Revised 3-Lead Plastic Small Outline Transistor (DB) [SOT-223]
5. Revised 5-Lead Plastic Small Outline Transistor (DB) [SOT-223]
6. Revised 4-Lead Plastic Small Outline Transistor (RC) [SOT-143]
7. Revised 5-Lead Plastic Small Outline Transistor (OT or CT) [SOT-23]
8. Revised 6-Lead Plastic Small Outline Transistor (CH) [SOT-23]
9. Revised 8-Lead Plastic Dual In-Line (P or PA) 300 mil Body [PDIP]
10. Revised 14-Lead Plastic Dual In-Line (P or PD) 300 mil Body [PDIP]
11. Revised 16-Lead Plastic Dual In-Line (P or PE) 300 mil Body [PDIP]
12. Revised 24-Lead Plastic Dual In-Line (P or PG) 600 mil Body [PDIP]
13. Revised 24-Lead Skinny Plastic Dual In-Line (SP or PF) 300 mil Body [SPDIP]
14. Revised 28-Lead Skinny Plastic Dual In-Line (SP or PJ) 300 mil Body [SPDIP]
15. Revised 28-Lead Plastic Dual In-Line (P or PI) 600 mil Body [PDIP]
16. Revised 40-Lead Plastic Dual In-Line (P or PL) 600 mil Body [PDIP]
17. Revised 20-Lead Plastic Leaded Chip Carrier (L) Square [PLCC]
18. Revised 28-Lead Plastic Leaded Chip Carrier (L or LI) Square [PLCC]
19. Revised 32-Lead Plastic Leaded Chip Carrier (L) Rectangle [PLCC]
20. Revised 44-Lead Plastic Leaded Chip Carrier (L or LW) Square [PLCC]
21. Revised 68-Lead Plastic Leaded Chip Carrier (L or LS) Square [PLCC]
22. Revised 84-Lead Plastic Leaded Chip Carrier (L) Square [PLCC]
23. Revised 8-Lead Plastic Small Outline (SN or OA) Narrow, 3.90 mm Body [SOIC]
24. Revised 14-Lead Plastic Small Outline (SL or OD) Narrow, 3.90 mm Body [SOIC]
25. Revised 16-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body [SOIC]

26. Revised 8-Lead Plastic Small Outline (SM) Medium, 5.28 mm Body [SOIJ]
27. Revised 16-Lead Plastic Small Outline (SO or OE) Wide, 7.50 mm Body [SOIC]
28. Revised 18-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC]
29. Revised 20-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC]
30. Revised 24-Lead Plastic Small Outline (SO or PF) Wide, 7.50 mm Body [SOIC]
31. Revised 28-Lead Plastic Small Outline (SO or OI) Wide, 7.50 mm Body [SOIC]
32. Revised 8-Lead Plastic Micro Small Outline Package (MS or UA) [MSOP]
33. Revised 10-Lead Plastic Micro Small Outline Package (MS or UN) [MSOP]
34. Revised 16-Lead Plastic Shrink Small Outline Narrow Body (QR) .150" Body [QSOP]
35. Revised 64-Lead Plastic Metric Quad Flatpack (KU) 14x14x2.7 mm Body, 3.20 mm Footprint [MQFP]
36. Revised 44-Lead Plastic Metric Quad Flatpack (KW) 10x10x2.0 mm Body, 3.9 mm Footprint [PQFP]

Revision AM (March 2007)

Four Microchip and Telcom package designators were corrected and one package was removed.

1. Revised 6-Lead Plastic Small Outline Transistor (CH) [SOT-23] to (CH or OT)
2. Revised 3-Lead Plastic Small Outline Transistor (CB or NB) [SOT-23A] to (CB)
3. Revised 44-Lead Plastic Metric Quad Flatpack (PQ) [MQFP] to (PQ or KW)
4. Revised 64-Lead Plastic Metric Quad Flatpack (KU) [MQFP] to (BU)
5. Deleted 44-Lead Plastic Metric Quad Flatpack (KW) – 10x10x2.0 mm Body, 3.9 mm Footprint [PQFP]

Revision AN (March 2007)

16-Lead Plastic Shrink Small Outline Narrow Body (QR) .150" Body [QSOP]: the nominal pitch value for the package is corrected to ".025." This correction revises MCHP Drawing C04-024B to C04-024C.

Packages with a Microchip and a Telcom designator are represented on separate pages, rather than having both designators on a single page.

Revision AP (April 2007)

Revised 40-Lead Ceramic Dual In-Line with Window (JW) .600" Body [CERDIP]. The E-1 MAX dimension has changed from ".540" to ".583". This correction revises MCHP Drawing C04-014B to C04-014C.

Revision AQ (July 2007)

Revised 5-Lead Plastic Small Outline Transistor [SOT-223] package designator from (DB) to (DC). This correction revises MCHP Drawing C04-137A to C04-137B.

Revision AR (September 2007)

Land patterns have been added for the following 13 packages:

8-Lead Plastic Small Outline (SN) – Narrow, 3.90 mm Body [SOIC]

28-Lead Plastic Quad Flat, No Lead Package (ML) – 6x6 mm Body [QFN]
with 0.55 mm Contact Length

28-Lead Plastic Quad Flat, No Lead Package (MM) – 6x6x0.9 mm Body [QFN-S]
with 0.40 mm Contact Length

44-Lead Plastic Quad Flat, No Lead Package (ML) – 8x8 mm Body [QFN]

44-Lead Plastic Metric Quad Flatpack (PQ) – 10x10x2 mm Body, 3.20 mm [MQFP]

64-Lead Plastic Metric Quad Flatpack (BU) – 14x14x2.7 mm Body, 3.20 mm [MQFP]

44-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

64-Lead Plastic Thin Quad Flatpack (PT) – 10x10x1 mm Body, 2.00 mm [TQFP]

64-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

80-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

80-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

100-Lead Plastic Thin Quad Flatpack (PT) – 12x12x1 mm Body, 2.00 mm [TQFP]

100-Lead Plastic Thin Quad Flatpack (PF) – 14x14x1 mm Body, 2.00 mm [TQFP]

Please refer to the Packaging Index for page numbers.

Notes: Packaging outline drawings and land pattern drawings appear on facing pages.

The last three digits of a package outline drawing number will always correspond to the last three digits of the land pattern drawing number.

The Microchip drawing number for any land pattern begins with the following characters: C04-xxxx.

Revision AS (January 2008)

The following packages are new:

- Drawing 0129B, 8-Lead Plastic Dual Flat, No Lead Package (MN) - 2x3x0.75 mm Body [TDFN] on page 156.
- Drawing 136B, 8-Lead Plastic Dual Flat, No Lead Package (MU) - 2x3x0.5 mm Body [UDFN] on page 158.

Land patterns have been added for the following packages:

- Drawing 2032A, 3-Lead Plastic Small Outline Transistor (DB) Footprint [SOT-223] on page 33.
- Drawing 2137A, 5-Lead Plastic Small Outline Transistor (DC) Footprint [SOT-223] on page 35.
- Drawing 2031A, 4-Lead Plastic Small Outline Transistor (RC) Footprint [SOT-143] on page 37.
- Drawing 2057A, 8-Lead Plastic Small Outline (SN) Narrow, 3.90 mm Body Footprint [SOIC] on page 79.
- Drawing 2057A, 8-Lead Plastic Small Outline (OA) Narrow, 3.90 mm Body Footprint [SOIC] on page 81.
- Drawing 2056A, 8-Lead Plastic Small Outline (SM) Medium, 5.28 mm Body Footprint [SOIJ] on page 86.
- Drawing 2123A, 8-Lead Plastic Dual Flat, No Lead Package (MC) 2x3x0.9 mm Body Footprint [DFN] on page 99.
- Drawing 2062A, 8-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9 mm Body Footprint [DFN] on page 103.
- Drawing 2131A, 8-Lead Plastic Dual Flat, No Lead Package (MD) 4x4x0.9 mm Body Footprint [DFN] on page 105.
- Drawing 2063A, 10-Lead Plastic Dual Flat, No Lead Package (MF) 3x3x0.9 mm Body Footprint [DFN] on page 109.
- Drawing 2129A, 8-Lead Plastic Dual Flat, No Lead Package (MN) - 2x3x0.75 mm Body Footprint [TDFN] on page 157.
- Drawing 2136A, 8-Lead Plastic Dual Flat, No Lead Package (MU) - 2x3x0.5 mm Body Footprint [UDFN] on page 159.

Corrections have been made to the following packages:

- Drawing 123C, 8-Lead Plastic Dual Flat, No Lead Package (MC) 2x3x0.9 mm Body [DFN] on page 98.
- Drawing 131D, 8-Lead Plastic Dual Flat, No Lead Package (MD) 4x4x0.9 mm Body [DFN] on page 104.
- Drawing 2116A, 80-Lead Plastic Thin Quad Flatpack (PF) 14x14x1 mm Body, 2.00 mm Footprint [TQFP] on page 151.

Packaging

Revision AT (June 2008)

Revised 24-Lead Plastic Small Outline [SOIC], Wide, 7.50 mm Body package designator from (PF) to (OG) on page 104.

The following packages are new:

- Drawing 0143A, 24-Lead Plastic Quad Flat, No Lead Package (MJ) 4x4 mm Body [QFN] on page 130.
- Drawing 0144A, 28-Lead Plastic Quad Flat, No Lead Package (MK) 4x4 mm Body [QFN] on page 132.
- Drawing 0140A, 28-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5 mm Body [QFN] on page 134.
- Drawing 0145A, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern [CSP]. on page 182.

Land patterns have been added for the following packages:

- Drawing 2060A, 3-Lead Plastic Small Outline Transistor (LB) Footprint [SC70] on page 43.
- Drawing 2061A, 5-Lead Plastic Small Outline Transistor (LT) Footprint [SC70] on page 45.
- Drawing 2015A, 7-Lead Plastic (EK) Footprint [DDPAK] on page 51.
- Drawing 2065A, 14-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body Footprint [SOIC] on page 89.
- Drawing 2065A, 14-Lead Plastic Small Outline (OD) Narrow, 3.90 mm Body Footprint [SOIC] on page 91.
- Drawing 2108A, 16-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body Footprint [SOIC] on page 93.
- Drawing 2102A, 16-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 97.
- Drawing 2102A, 16-Lead Plastic Small Outline (OE) Wide, 7.50 mm Body Footprint [SOIC] on page 99.
- Drawing 2051A, 18-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 101.
- Drawing 2122A, 8-Lead Plastic Dual Flat, No Lead Package (MF) 6x5 mm Body Footprint [DFN-S] on page 119.
- Drawing 2127A, 16-Lead Plastic Quad Flat, No Lead Package (ML) 4x4x0.9 mm Body Footprint [QFN] on page 127.
- Drawing 2126A, 20-Lead Plastic Quad Flat, No Lead Package (ML) 4x4x0.9 mm Body Footprint [QFN] on page 129.
- Drawing 2143A, 24-Lead Plastic Quad Flat, No Lead Package (MJ) 4x4 mm Body Footprint [QFN] on page 131.

- Drawing 2144A, 28-Lead Plastic Quad Flat, No Lead Package (MK) 4x4 mm Body Footprint [QFN] on page 133.
- Drawing 2140A, 28-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5 mm Body Footprint [QFN] on page 135.

Revision AU (June 2008)

Updated 8-Lead Plastic Small Outline (SM) Medium 5.28 mm Body Footprint [SOIJ] on page 95.

Revision AV (September 2008)

Added Drawing 0139A, 20-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5x0.9 mm Body [QFN] on page 124.

Revision AW (October 2008)

Revised 40-Lead Plastic Quad Flat, No Lead Package (MM) 6x6x0.9 mm Body [QFN] on page 136, correcting the package designator from (MM) to (ML).

NOTES:



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