



Packaging Specification

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ISBN: 978-1-62076-350-6

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CERTIFIED BY DNV
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PACKAGING SPECIFICATION

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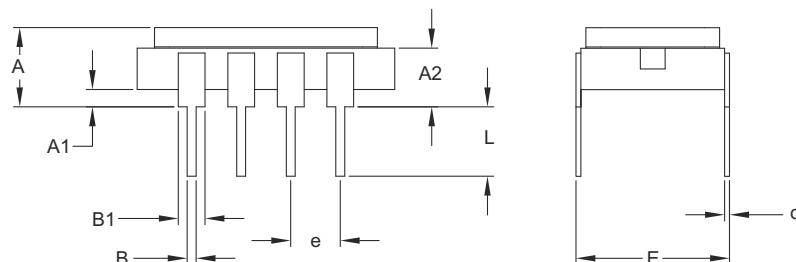
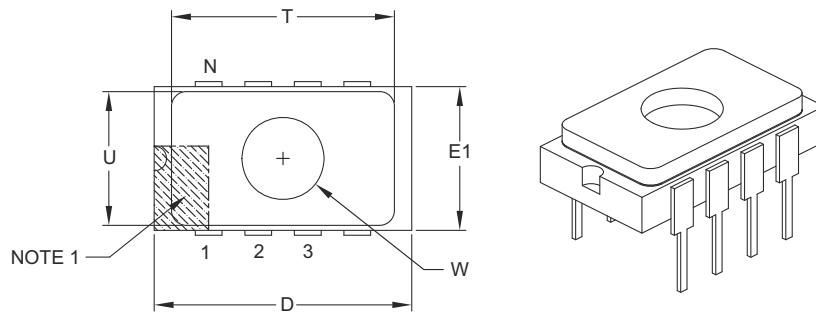
SIDEBRAZE Family

Ceramic Side Brazed Dual In-Line Packages

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>



| | Dimension Limits | INCHES | | |
|------------------------------|------------------|--------|----------|------|
| | | 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:

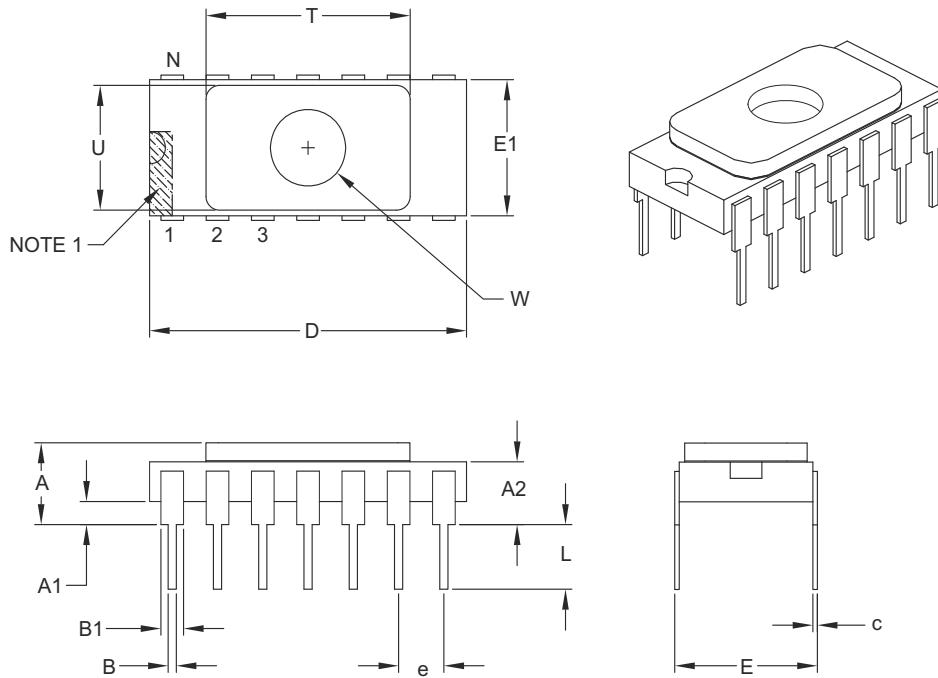
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include burrs and/or projections of package material. These particles shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

14-Lead Ceramic Side 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 | | 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.

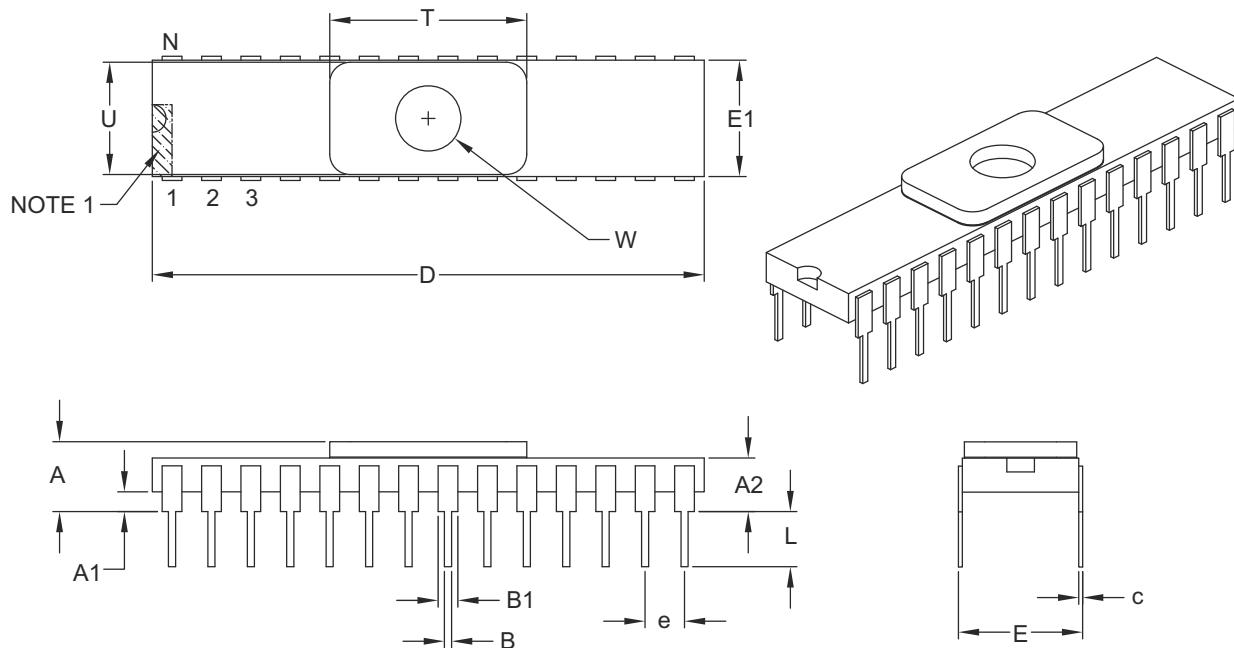
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-107B

Packaging Diagrams and Parameters

28-Lead Ceramic Side 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 | | 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

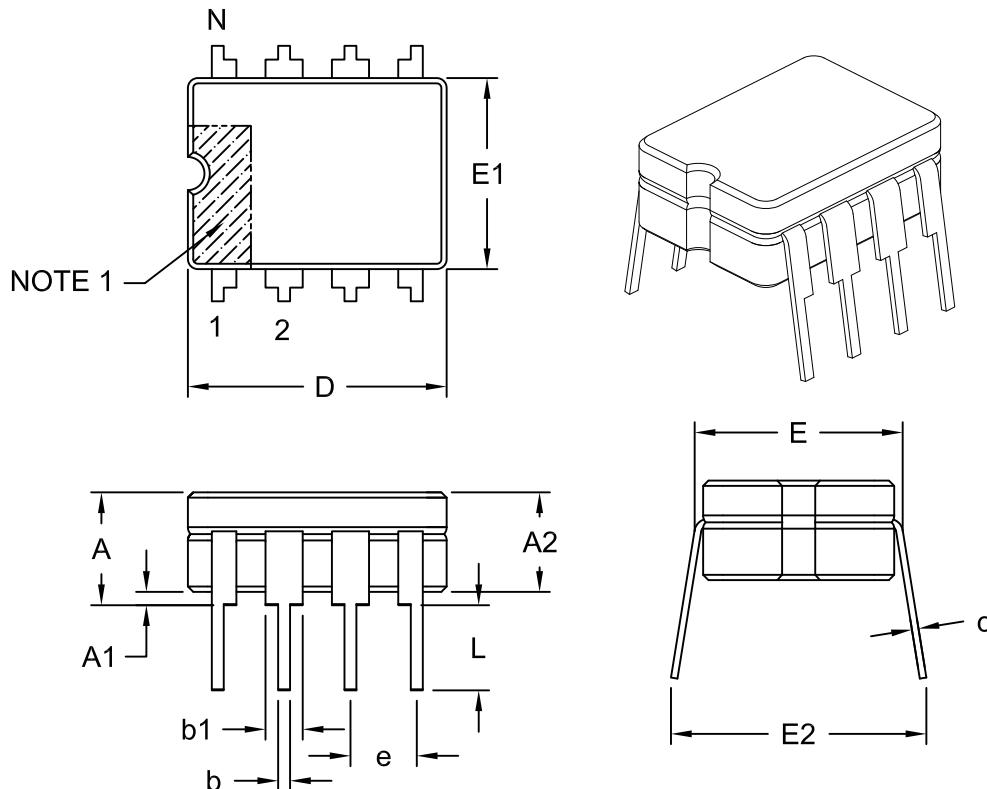
CERDIP Family

Ceramic Dual In-Line Packages

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 |
| Base to Seating Plane § | A1 | .015 | - | - |
| Ceramic Package Height | A2 | .140 | - | .175 |
| Shoulder to Shoulder Width | E | .290 | - | .320 |
| Ceramic Pkg. 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

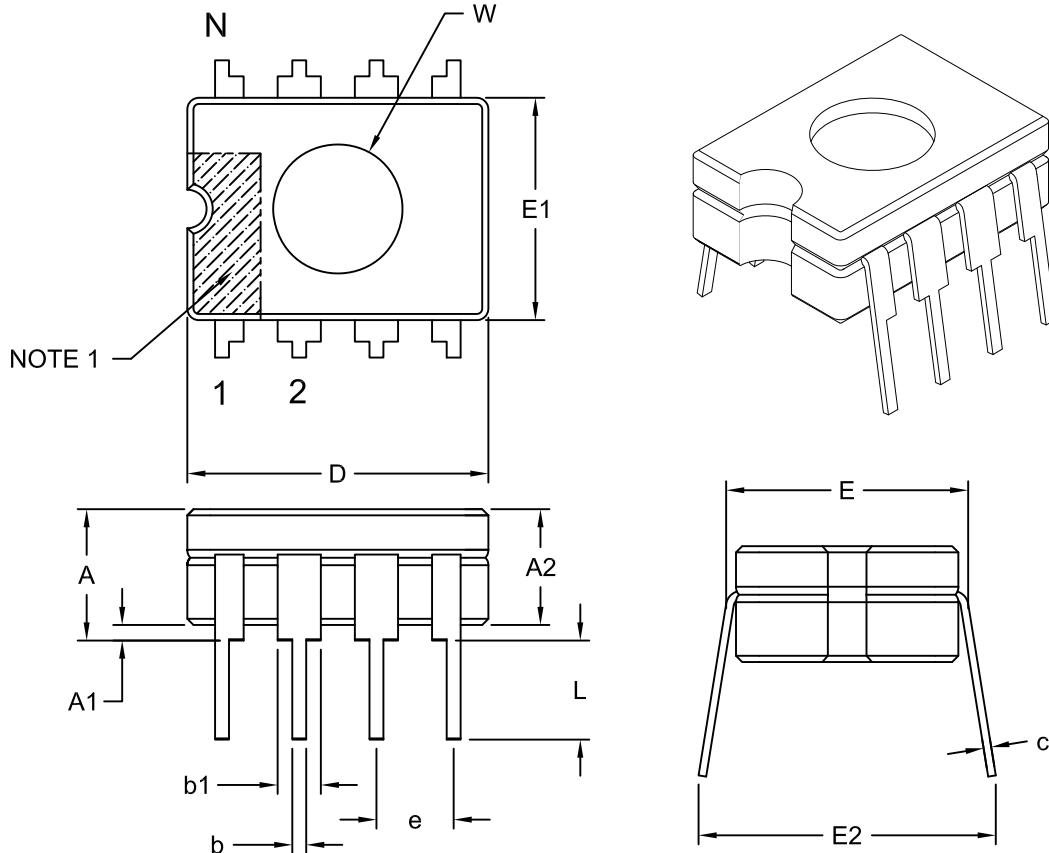
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-001C

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>



| Dimension Limits | Units | | | INCHES | | |
|----------------------------|-------|------|------|--------|------|------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| Number of Pins | N | | | .230 | .248 | .300 |
| Pitch | e | | | .100 | BSC | |
| Top to Seating Plane | A | - | - | .140 | | .200 |
| Base to Seating Plane § | A1 | .015 | | .015 | | |
| Ceramic Package Height | A2 | | | .065 | | .175 |
| Shoulder to Shoulder Width | E | .290 | | .290 | | .320 |
| Ceramic Pkg. Width | E1 | | | .045 | | .055 |
| Overall Length | D | .370 | .380 | .370 | .380 | .400 |
| Tip to Seating Plane | L | .125 | | .125 | | .200 |
| Lead Thickness | c | .008 | | .008 | | .015 |
| Upper Lead Width | b1 | | | .015 | | .023 |
| Lower Lead Width | b | | | .314 | | .410 |
| Overall Row Spacing | E2 | | | .267 | .270 | .273 |
| Window Diameter | W | | | | | |

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

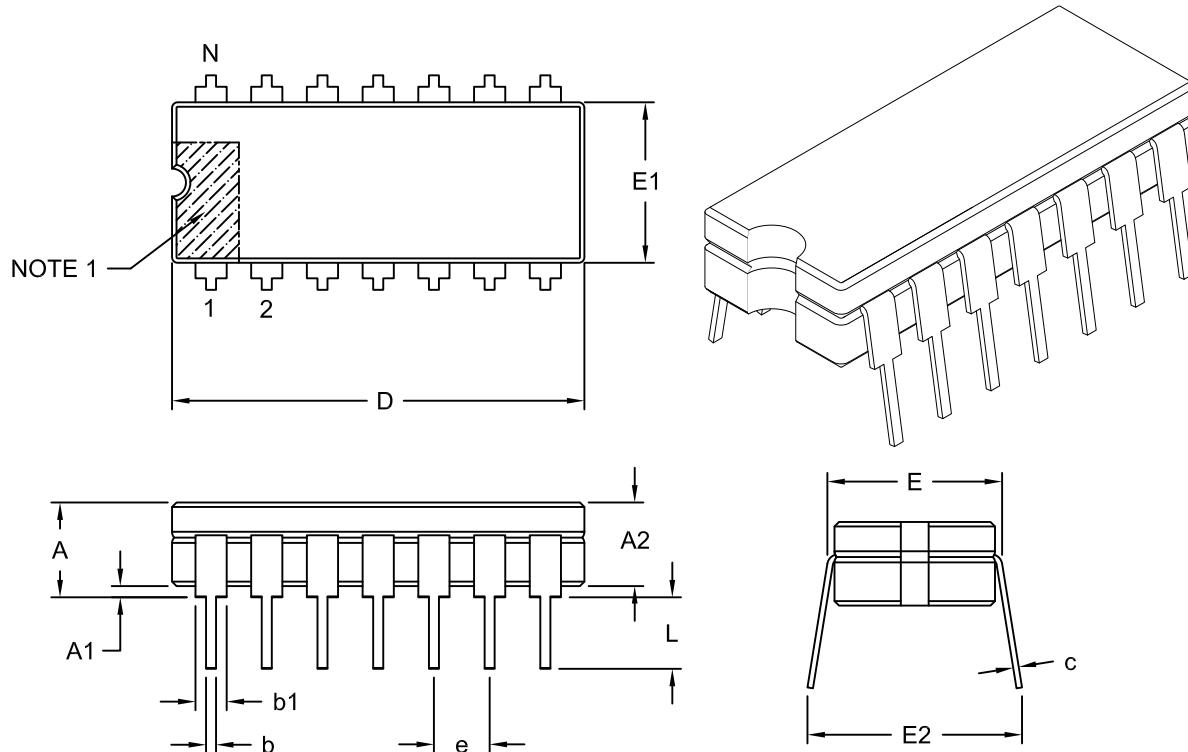
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-027C

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 | |
| Base to Seating Plane § | A1 | .015 | - | - | |
| Ceramic Package Height | A2 | .140 | - | .175 | |
| Shoulder-to-Shoulder Width | E | .290 | - | .325 | |
| Ceramic Pkg. 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

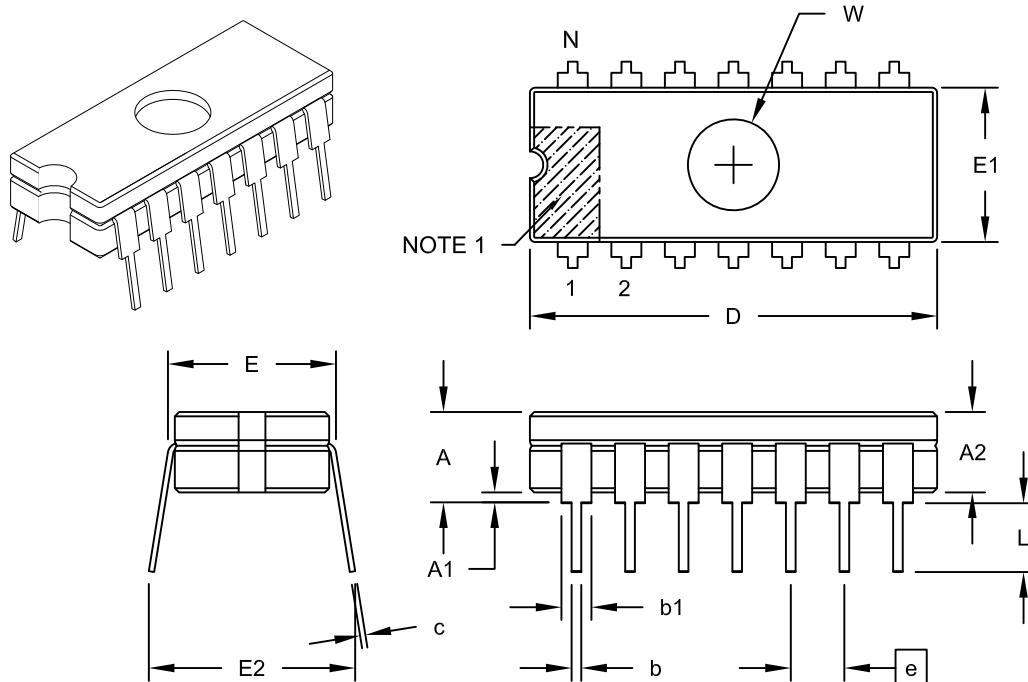
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-002C

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 |
| Base to Seating Plane § | A1 | .015 | - | - |
| Ceramic Package Height | A2 | .140 | - | .175 |
| Shoulder to Shoulder Width | E | .290 | - | .325 |
| Ceramic Pkg. 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.

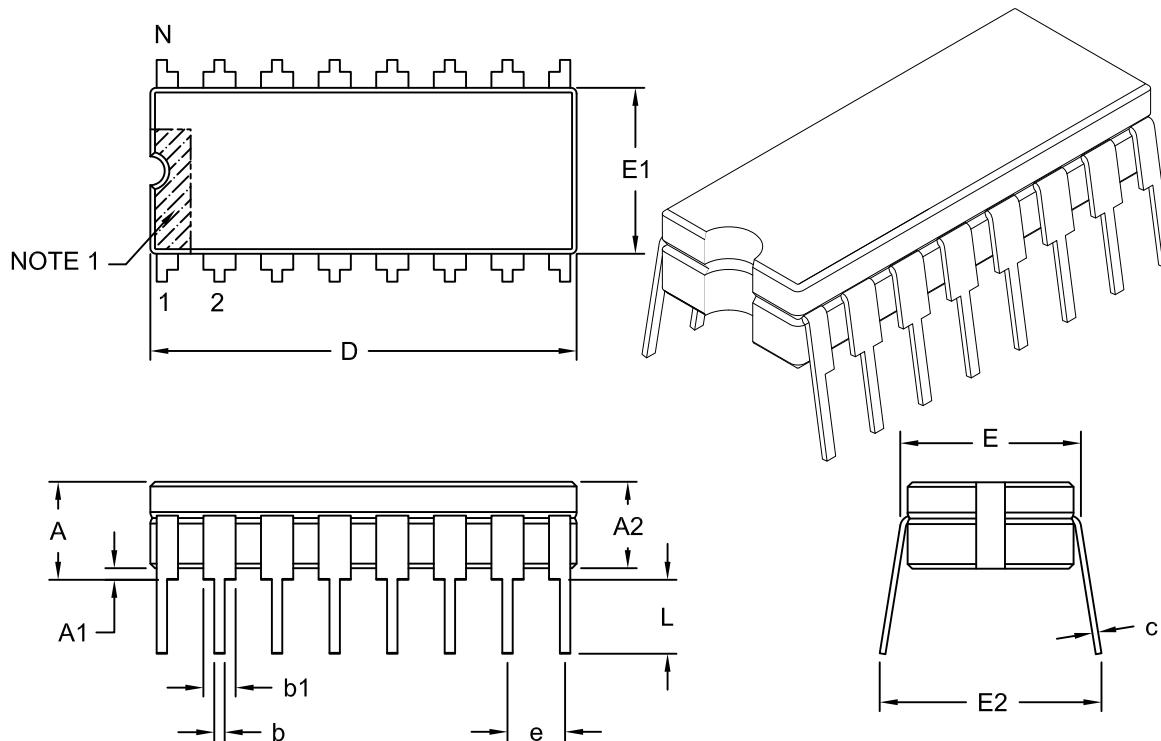
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing No. C04-099C

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>



| Dimension Limits | | INCHES | | |
|----------------------------|----|--------|----------|------|
| | | MIN | NOM | MAX |
| Number of Pins | N | | 16 | |
| Pitch | e | | .100 BSC | |
| Top to Seating Plane | A | - | - | .200 |
| Base to Seating Plane § | A1 | .015 | - | - |
| Ceramic Package Height | A2 | .140 | - | .175 |
| Shoulder to Shoulder Width | E | .290 | - | .325 |
| Ceramic Pkg. 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

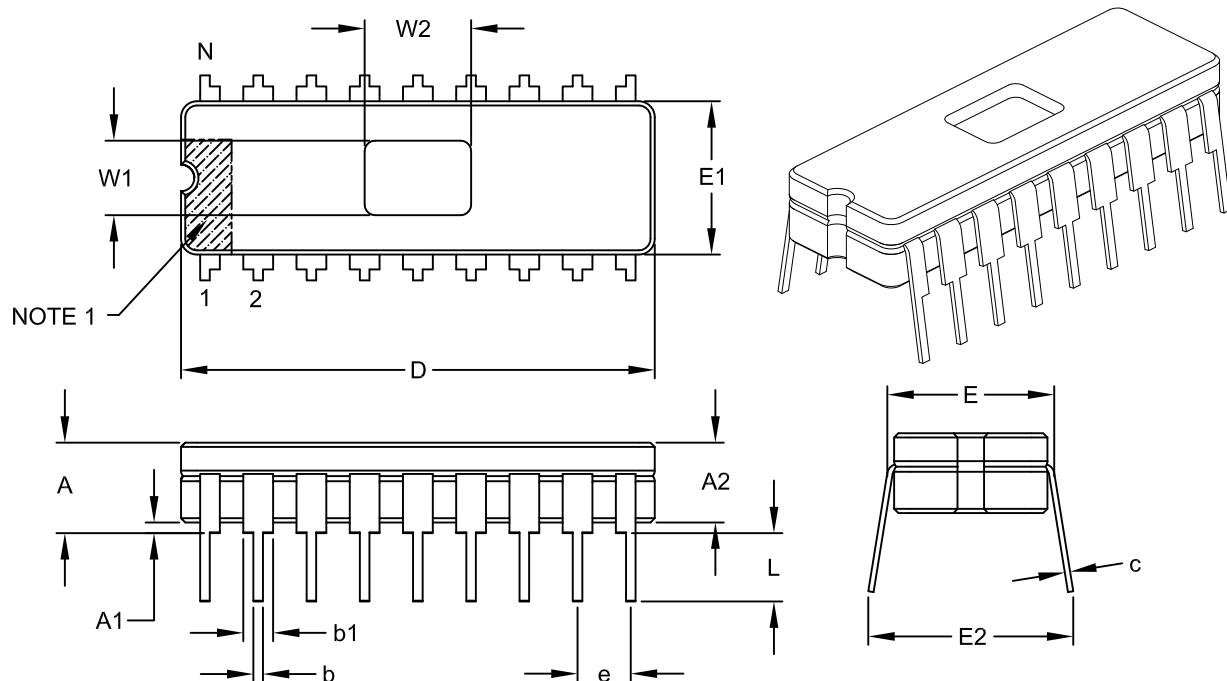
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-003C

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 | Units | INCHES | | |
|----------------------------|-------|--------|------|------|
| | N | MIN | NOM | MAX |
| Number of Pins | 18 | | | |
| Pitch | e | .100 | BSC | |
| Top to Seating Plane | A | - | - | .200 |
| Ceramic Package Height | A2 | .140 | - | .175 |
| Base to Seating Plane § | A1 | .015 | - | - |
| Shoulder to Shoulder Width | E | .308 | - | .325 |
| Ceramic Pkg. 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

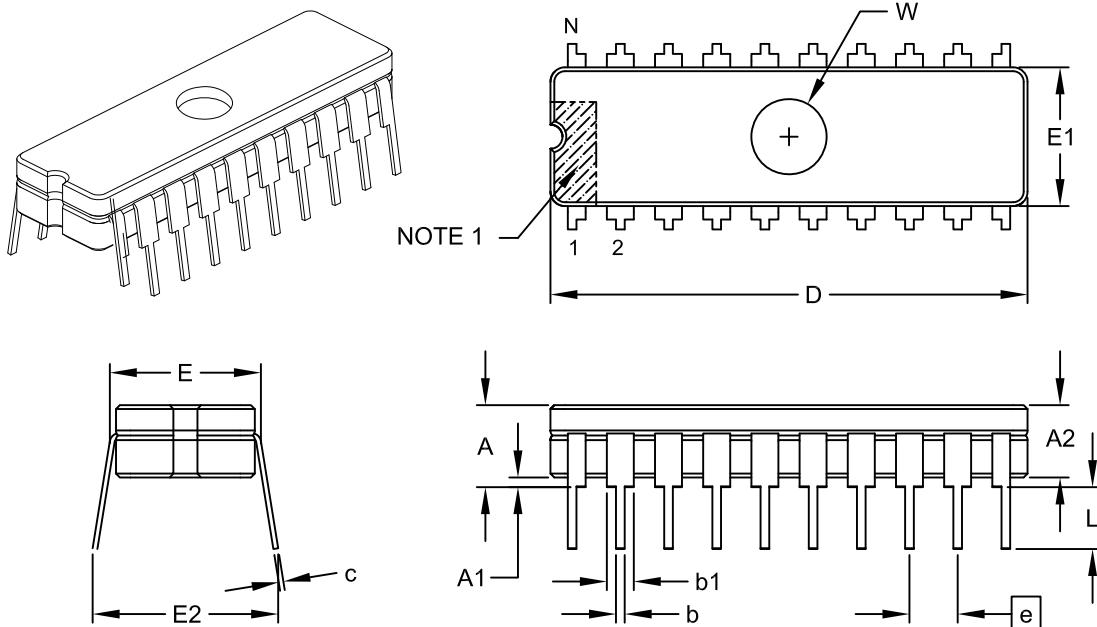
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-010C

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>



| Dimension | Units | INCHES | | |
|----------------------------|-------|--------|------|------|
| | | MIN | NOM | MAX |
| Number of Pins | N | 20 | | |
| Pitch | e | .100 | BSC | |
| Top to Seating Plane | A | - | - | .200 |
| Ceramic Package Height | A2 | .140 | - | .175 |
| Base to Seating Plane § | 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

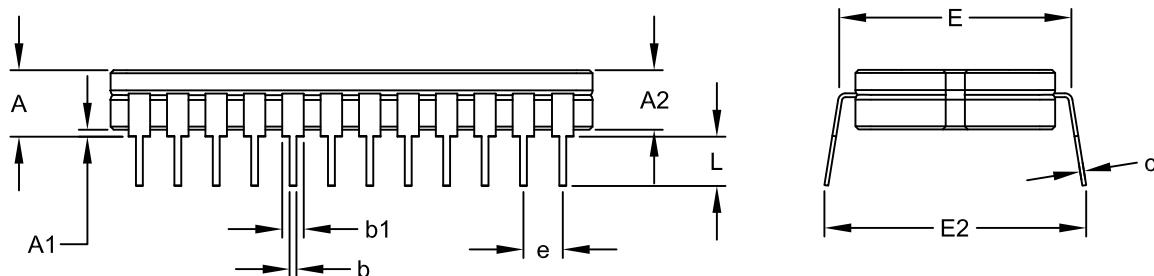
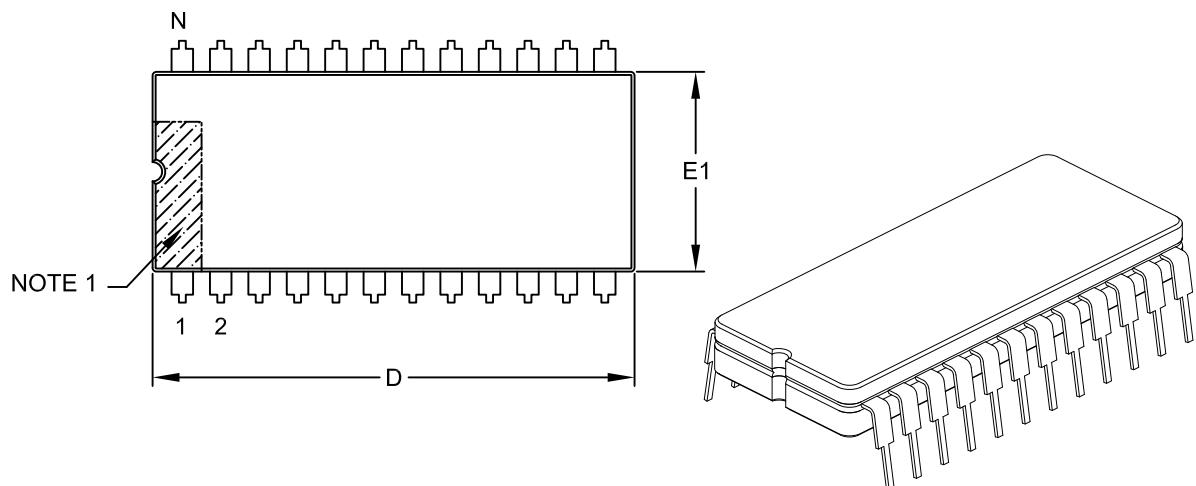
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-115C

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>



| Dimension Limits | INCHES | | |
|----------------------------|--------|----------|-------|
| | MIN | NOM | MAX |
| Number of Pins | N | 24 | |
| Pitch | e | .100 BSC | |
| Top to Seating Plane | A | - | .225 |
| Ceramic Package Height | A2 | .140 | .175 |
| Base to Seating Plane § | A1 | .015 | - |
| Shoulder to Shoulder Width | E | .590 | .625 |
| Ceramic Pkg. Width | E1 | .510 | .520 |
| Overall Length | D | 1.240 | 1.250 |
| 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

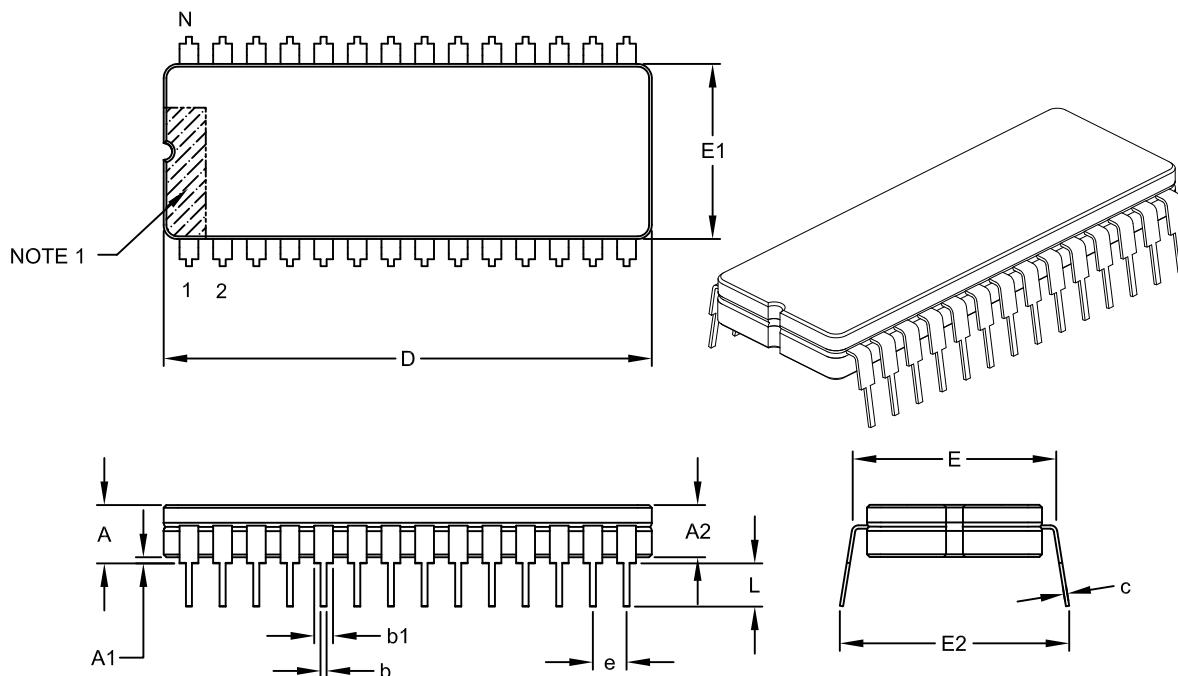
3. Dimensioning and tolerancing per ASME Y14.5M

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

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>



| Dimension Limits | Units | INCHES | | |
|----------------------------|-------|--------|-------|-------|
| | MIN | NOM | MAX | |
| Number of Pins | N | 28 | | |
| Pitch | e | .100 | BSC | |
| Top to Seating Plane | A | - | - | .225 |
| Ceramic Package Height | A2 | .140 | - | .175 |
| Base to Seating Plane § | A1 | .015 | - | - |
| Shoulder to Shoulder Width | E | .590 | - | .625 |
| Ceramic Pkg. 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

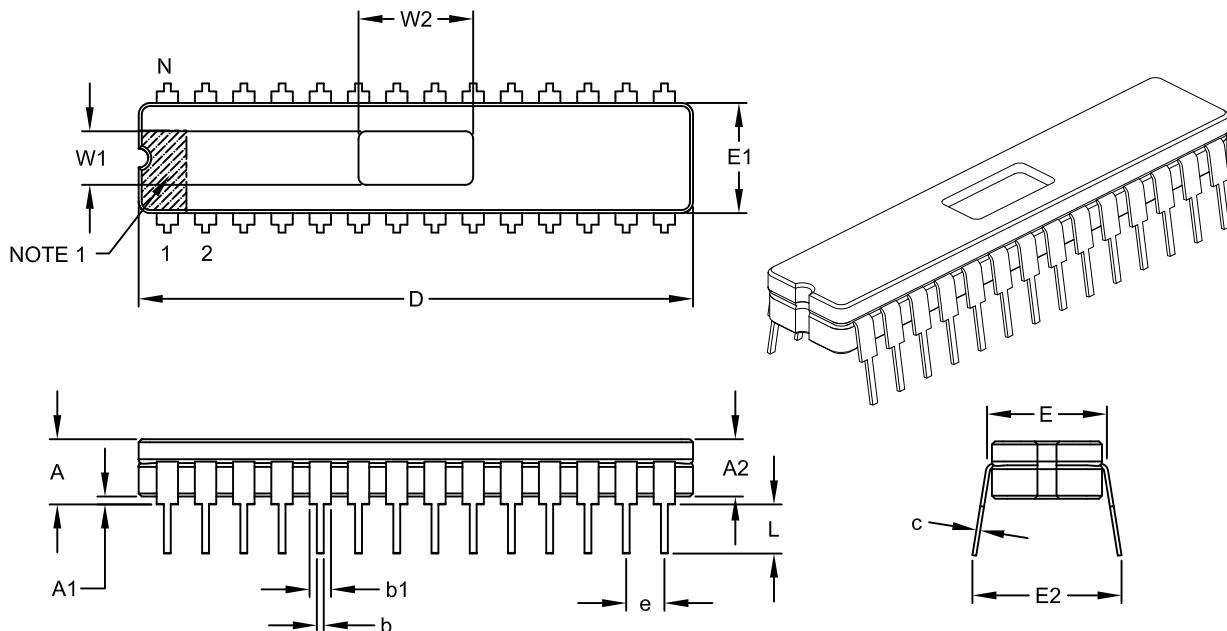
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-006C

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 | INCHES | | |
|----------------------------|--------|--------|----------|-------|
| | | MIN | NOM | MAX |
| Number of Pins | N | | 28 | |
| Pitch | e | | .100 BSC | |
| Top to Seating Plane | A | - | - | .200 |
| Ceramic Package Height | A2 | .140 | - | .175 |
| Base to Seating Plane § | 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

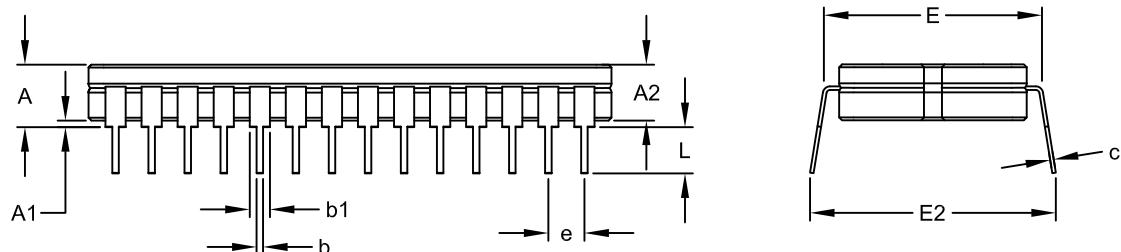
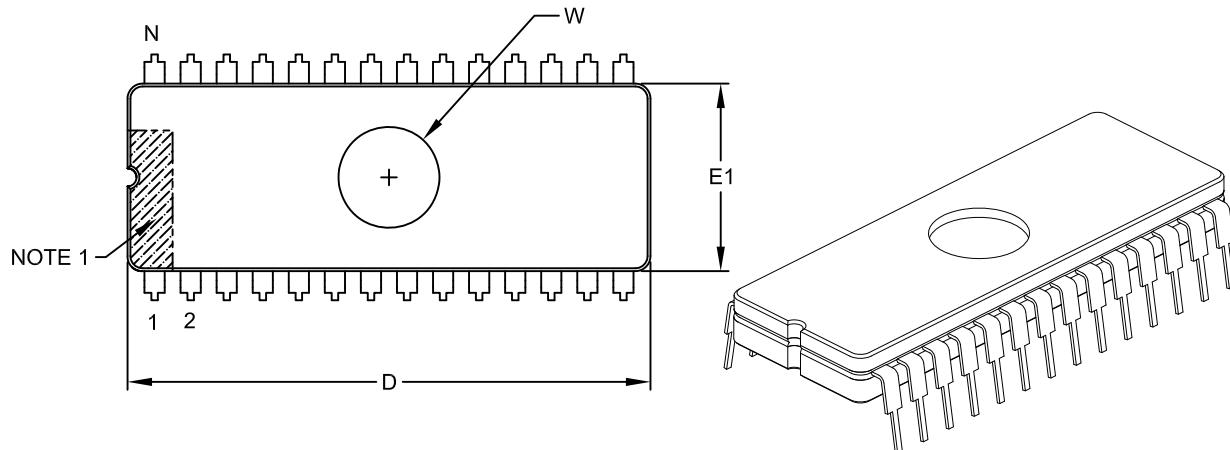
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-080C

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>



| | Dimension Limits | Units INCHES | | |
|----------------------------|------------------|--------------|----------|-------|
| | | MIN | NOM | MAX |
| Number of Pins | N | | 28 | |
| Pitch | e | | .100 BSC | |
| Top to Seating Plane | A | - | - | .225 |
| Ceramic Package Height | A2 | .140 | - | .175 |
| Base to Seating Plane § | 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:

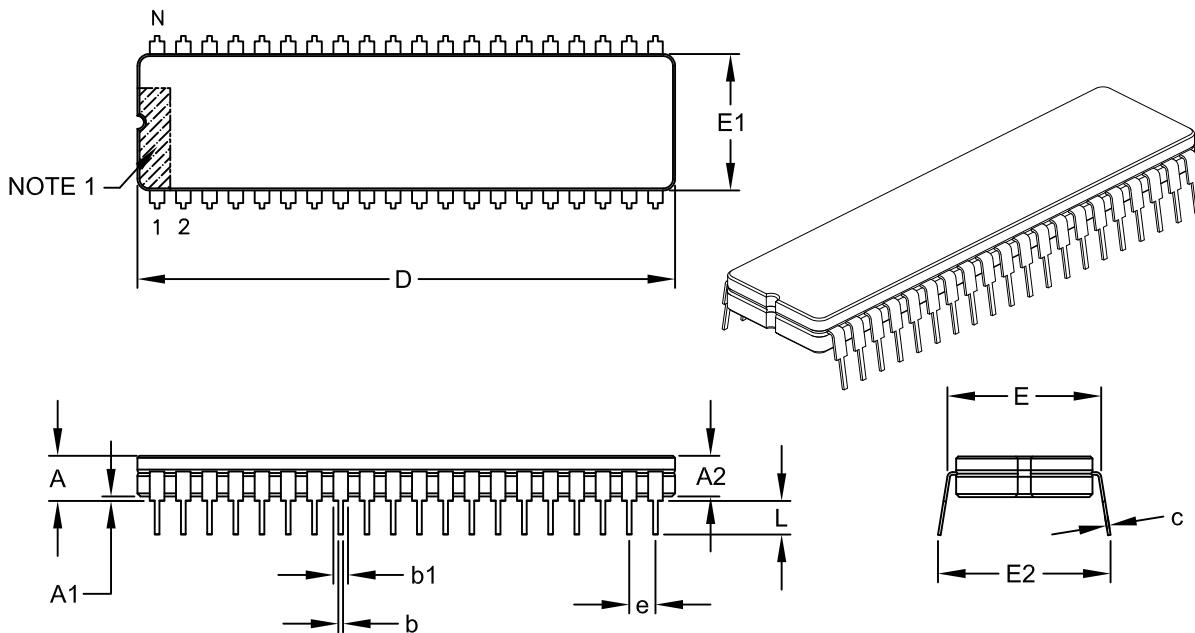
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic
3. Dimensioning and tolerancing per ASME Y14.5M

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

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>



| Dimension Limits | INCHES | | |
|----------------------------|--------|----------|-------|
| | MIN | NOM | MAX |
| Number of Pins | N | 40 | |
| Pitch | e | .100 BSC | |
| Top to Seating Plane | A | - | .225 |
| Ceramic Package Height | A2 | .140 | .175 |
| Base to Seating Plane § | A1 | .015 | - |
| Shoulder to Shoulder Width | E | .590 | .625 |
| Ceramic Package Width | E1 | .510 | .540 |
| Overall Length | D | 2.030 | 2.050 |
| 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

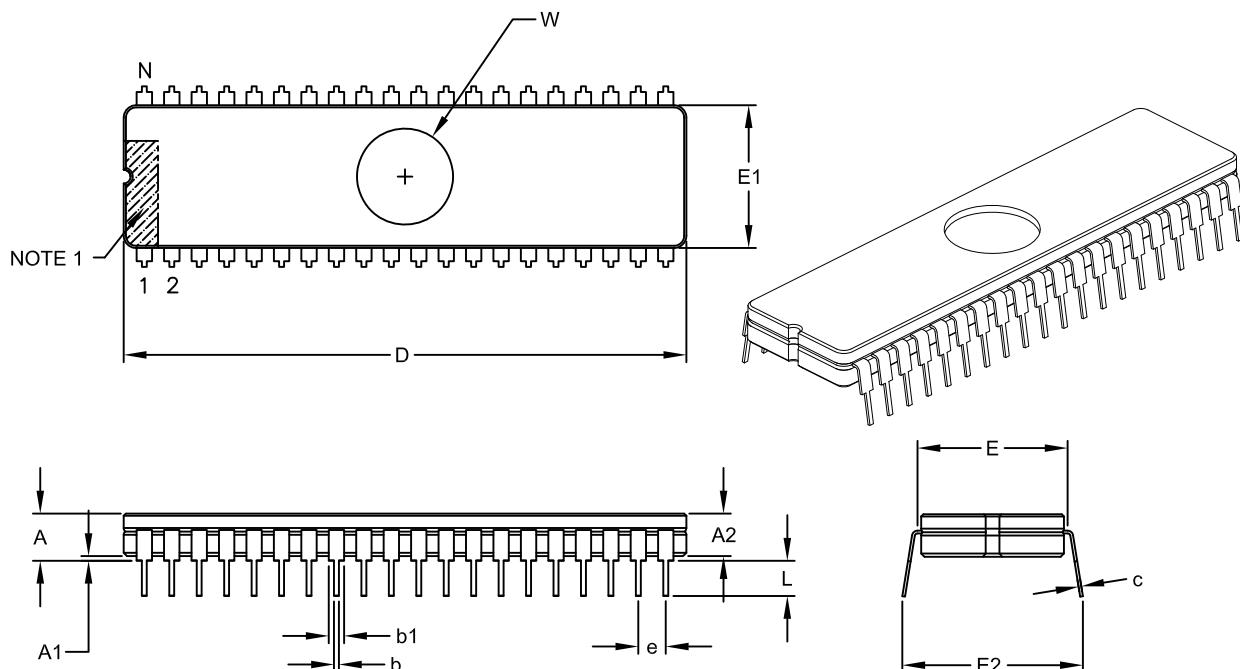
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-008C

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 |
| Base to Seating Plane § | 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.

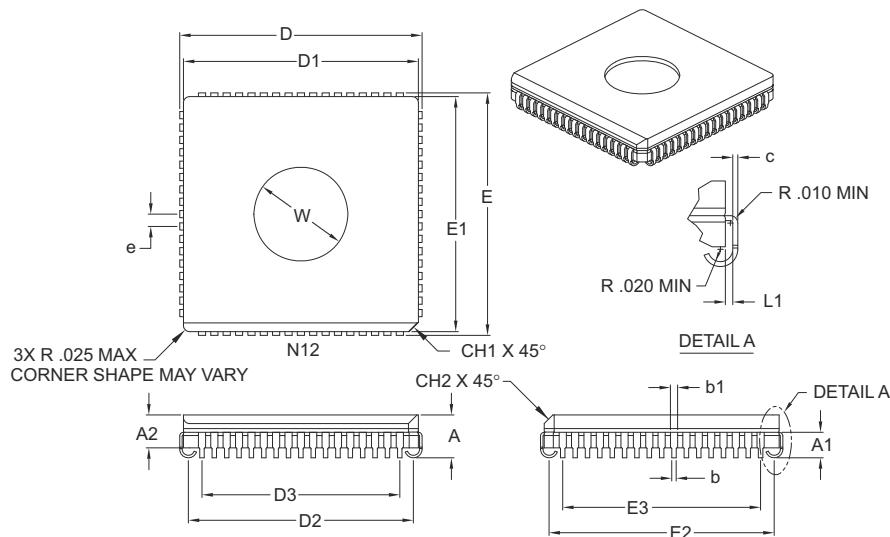
Packaging Diagrams and Parameters

CERQUAD Family
Ceramic Leaded Chip Carrier Packages

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.

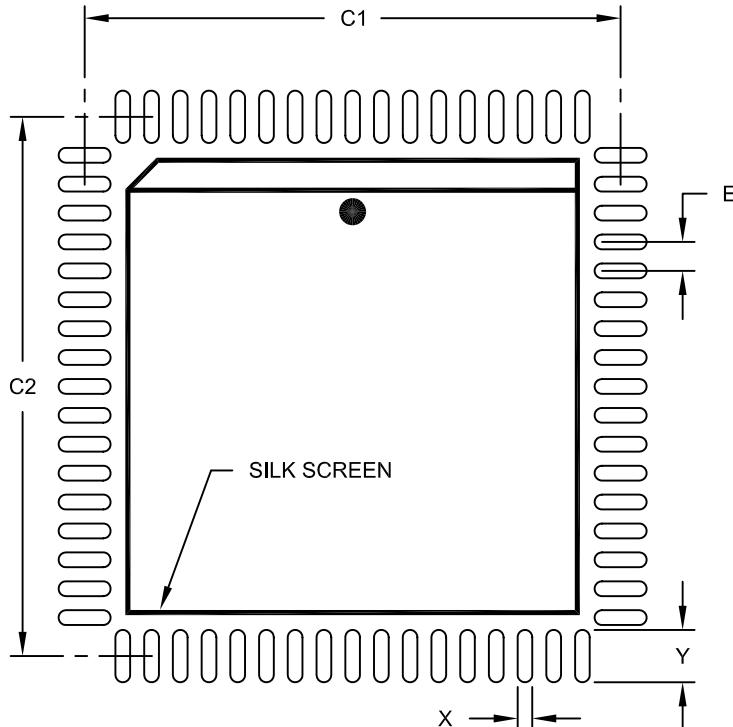
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-097B

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Dimension Limits | Units | INCHES | | |
|--------------------------|-------|--------|----------|------|
| | | MIN | NOM | MAX |
| Contact Pitch | E | | .050 BSC | |
| Contact Pad Spacing | C1 | | .933 | |
| Contact Pad Spacing | C2 | | .933 | |
| Contact Pad Width (X68) | X1 | | | .026 |
| Contact Pad Length (X68) | Y1 | | | .091 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

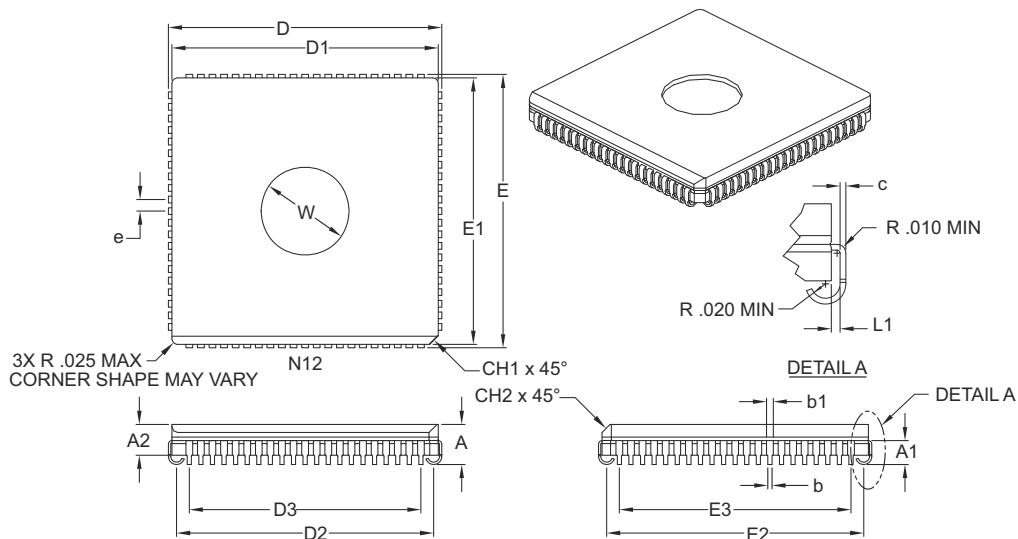
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2097A

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.

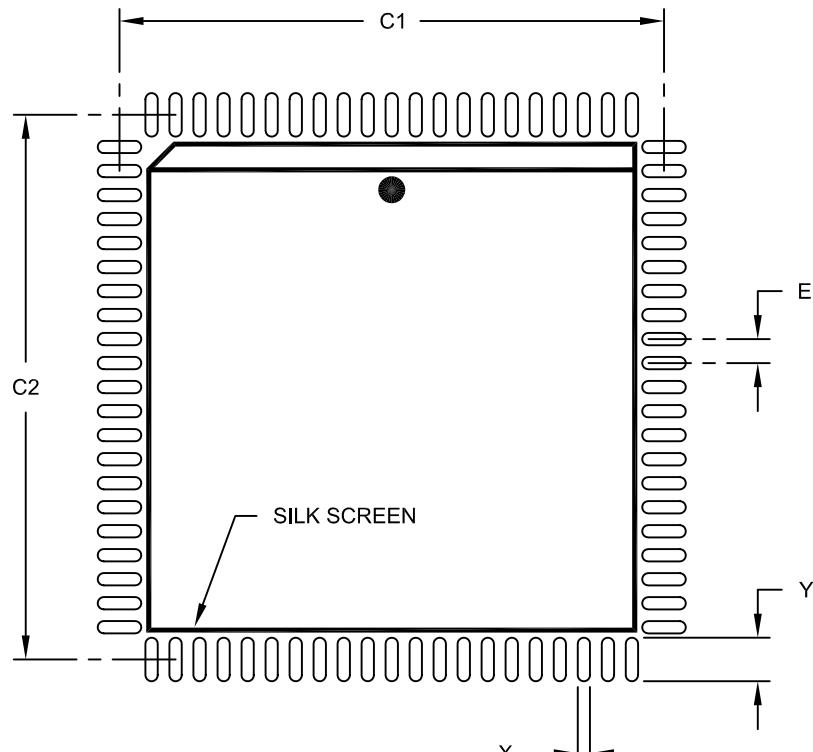
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-112B

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | INCHES | | |
|--------------------------|----|--------|-------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | | .050 | |
| Contact Pad Spacing | C1 | | 1.134 | |
| Contact Pad Spacing | C2 | | 1.134 | |
| Contact Pad Width (X84) | X | | | .026 |
| Contact Pad Length (X84) | Y | | | .091 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2112A



MICROCHIP

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

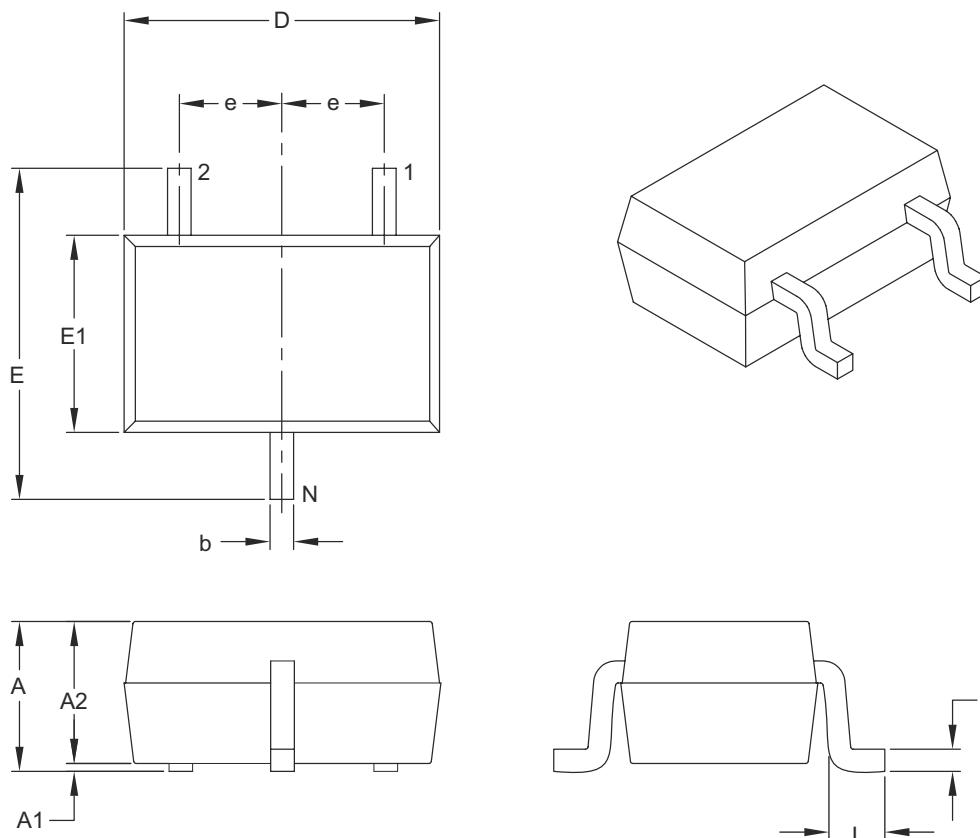
SOT Family

Small Outline Transistor Packages

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:

- 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.

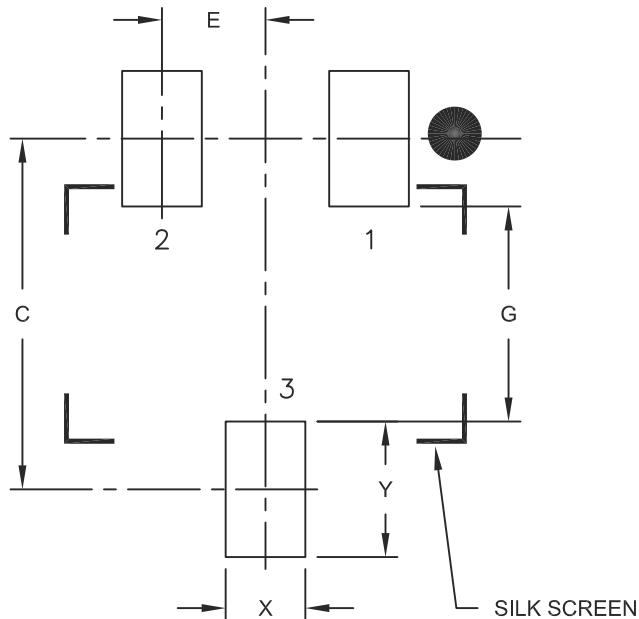
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-060B

Land Pattern (Footprint)

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>



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

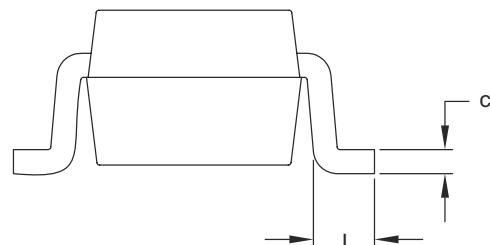
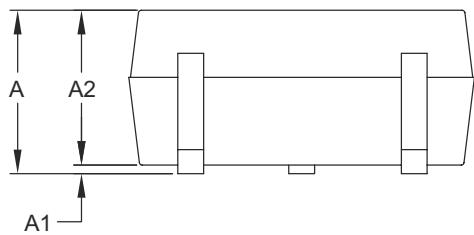
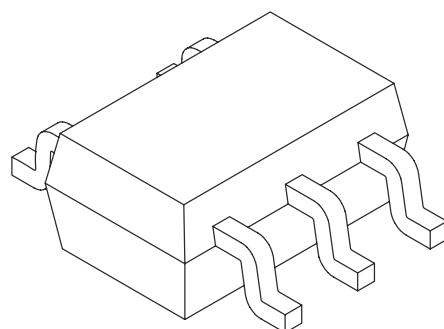
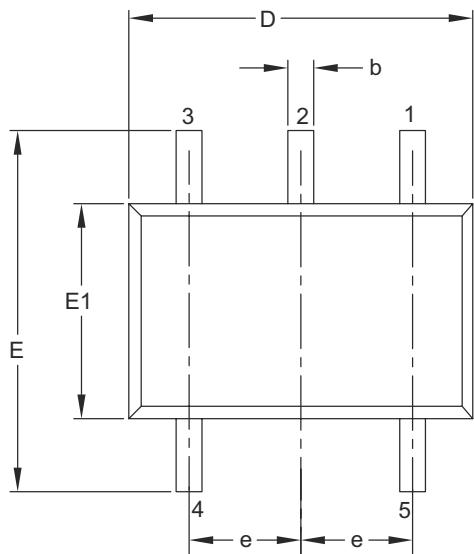
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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.

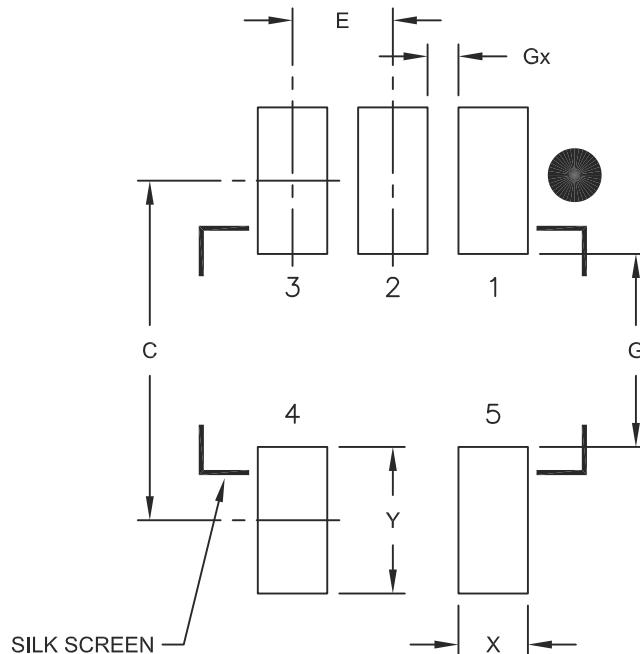
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-061B

Land Pattern (Footprint)

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

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

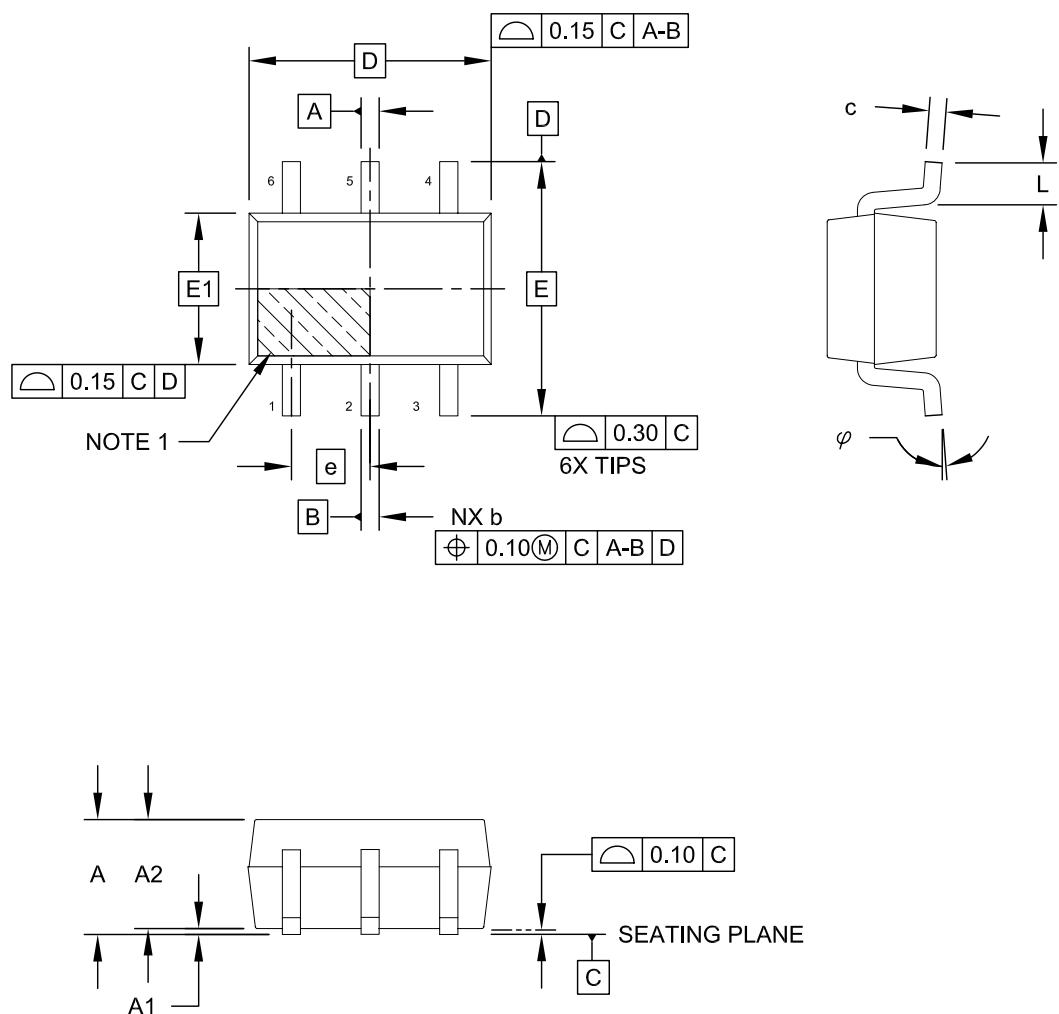
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2061A

Packaging Diagrams and Parameters

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

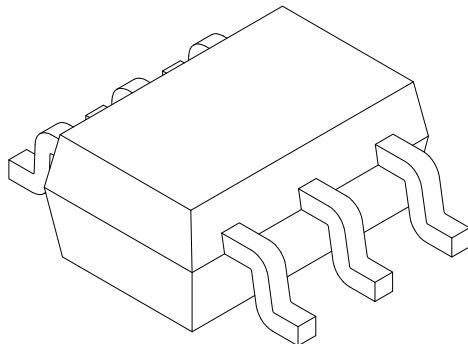
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

6-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 | | 6 | | |
| Pitch | e | | 0.65 | BSC | |
| Overall Height | A | 0.80 | - | 1.10 | |
| Molded Package Thickness | A2 | 0.70 | 0.90 | 1.00 | |
| Standoff | A1 | 0.00 | - | 0.10 | |
| Overall Width | E | 2.10 BSC | | | |
| Molded Package Width | E1 | 1.25 BSC | | | |
| Overall Length | D | 2.00 BSC | | | |
| Foot Length | L | 0.10 | 0.20 | 0.46 | |
| Lead Thickness | c | 0.08 | - | 0.22 | |
| Lead Width | b | 0.15 | - | 0.30 | |

Notes:

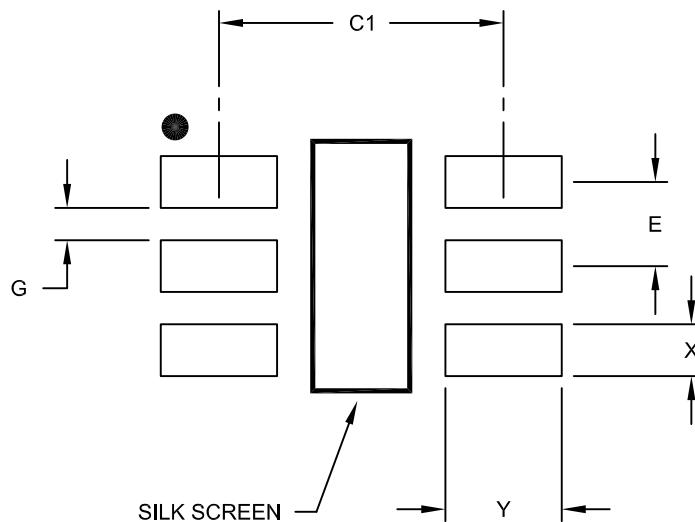
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M

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

Land Pattern (Footprint)

6-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>



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 (X6) | | X | | | 0.40 | | |
| Contact Pad Length (X6) | | Y | | | 0.90 | | |
| Distance Between Pads | | G | | | 0.25 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

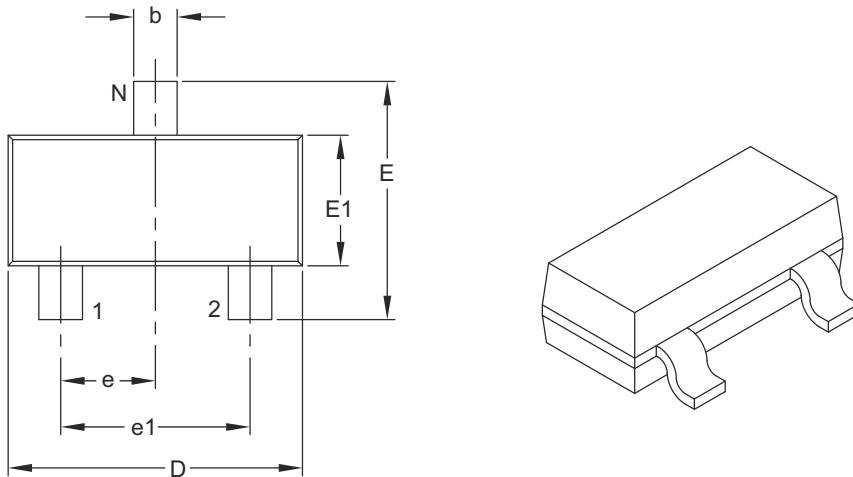
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2151A

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:

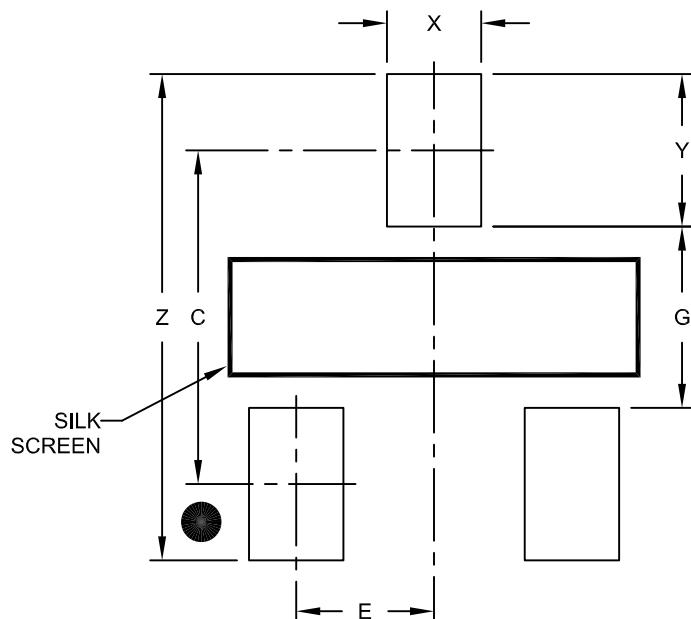
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|-------------------------|---|-------------|------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | 0.95 | BSC | |
| Contact Pad Spacing | C | | 2.30 | |
| Contact Pad Width (X3) | X | | | 0.65 |
| Contact Pad Length (Y3) | Y | | | 1.05 |
| Distance Between Pads | G | 1.25 | | |
| Overall Width | Z | | | 3.35 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

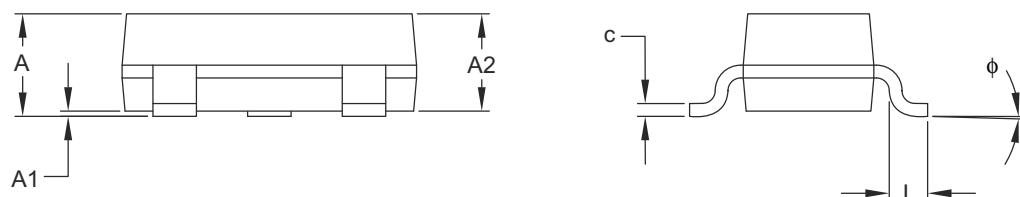
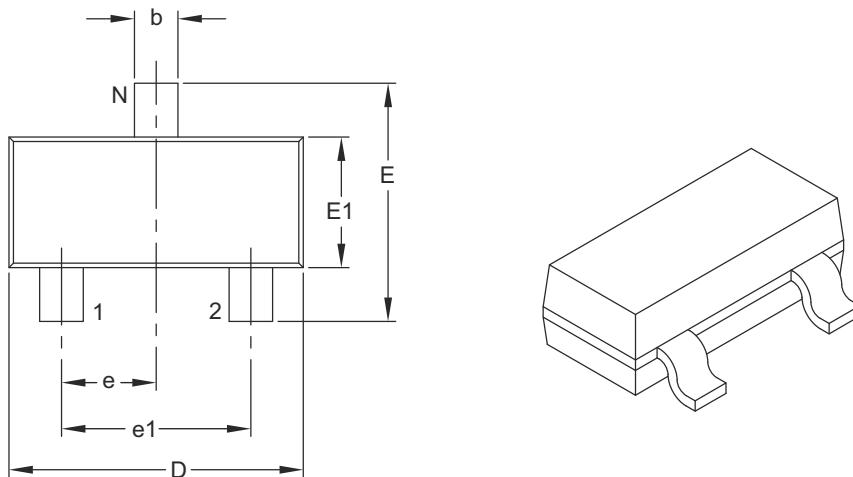
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2104A

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:

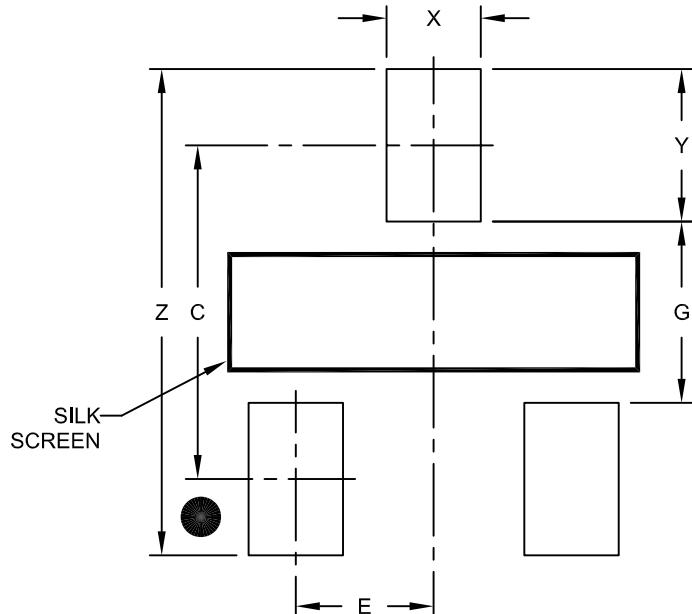
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.25 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| | | Units | | | MILLIMETERS | | |
|-------------------------|---|------------------|--|--|-------------|------|-----|
| | | Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | E | | | | 0.95 | BSC | |
| Contact Pad Spacing | C | | | | 2.30 | | |
| Contact Pad Width (X3) | X | | | | | 0.65 | |
| Contact Pad Length (X3) | Y | | | | | 1.05 | |
| Distance Between Pads | G | 1.25 | | | | | |
| Overall Width | Z | | | | 3.35 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

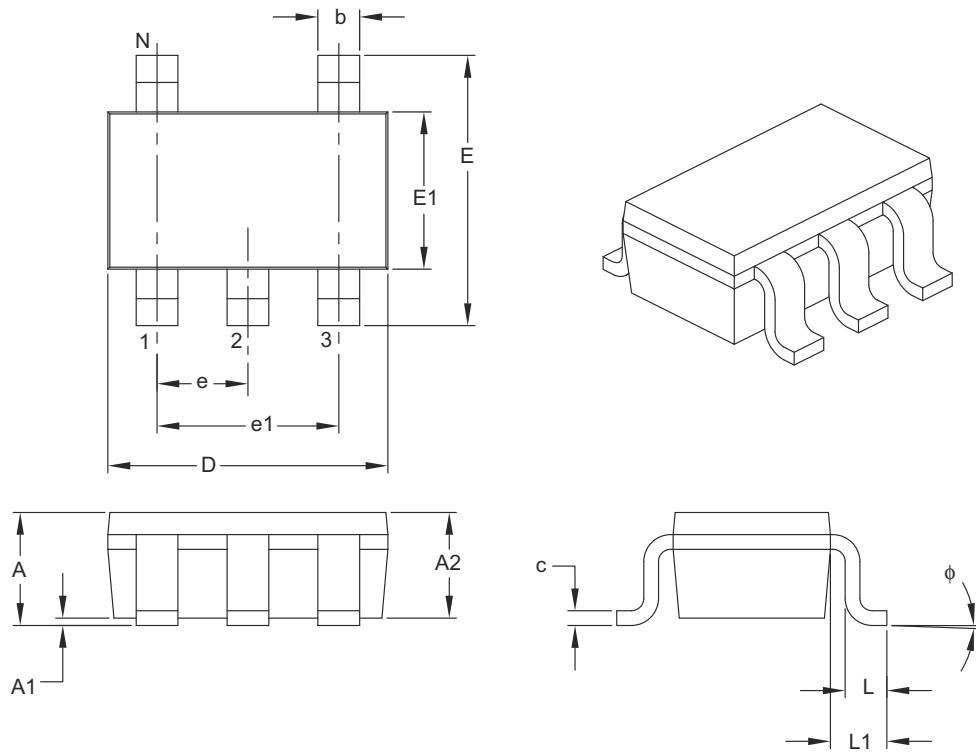
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2104A

Packaging Diagrams and Parameters

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 | phi | 0° | — | 30° | |
| Lead Thickness | c | 0.08 | — | 0.26 | |
| Lead Width | b | 0.20 | — | 0.51 | |

Notes:

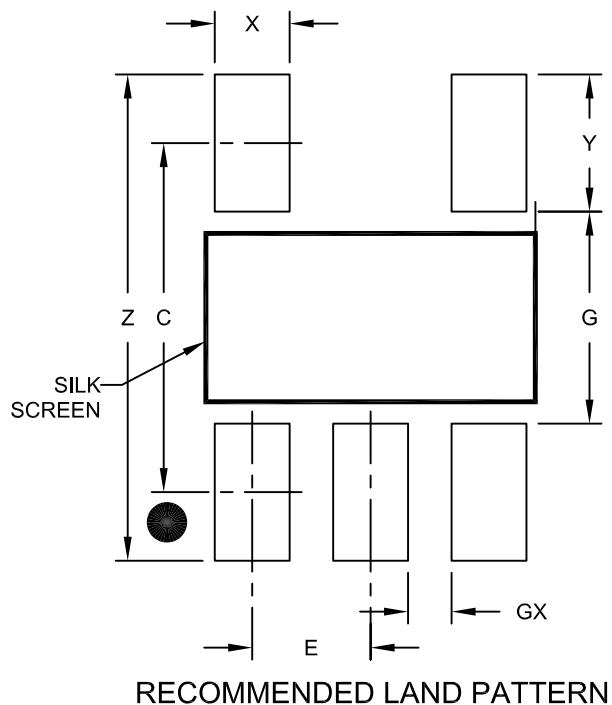
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

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 |
| Contact Pitch | E | 0.95 | BSC | |
| Contact Pad Spacing | C | | 2.80 | |
| Contact Pad Width (X5) | X | | | 0.60 |
| Contact Pad Length (X5) | Y | | | 1.10 |
| Distance Between Pads | G | 1.70 | | |
| Distance Between Pads | GX | 0.35 | | |
| Overall Width | Z | | | 3.90 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

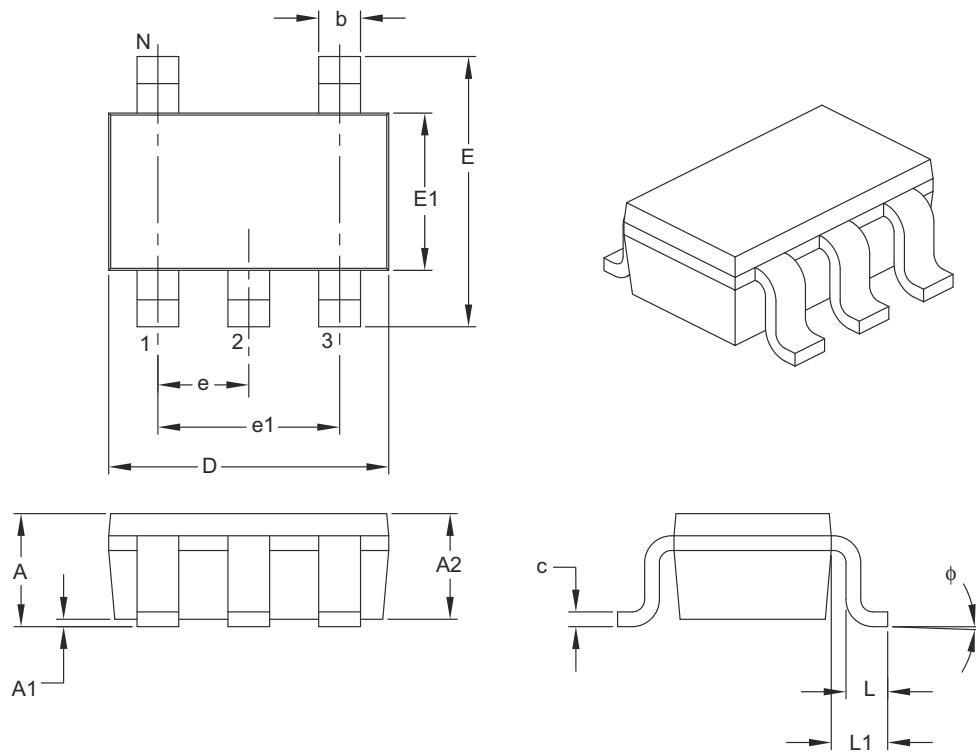
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2091A

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.

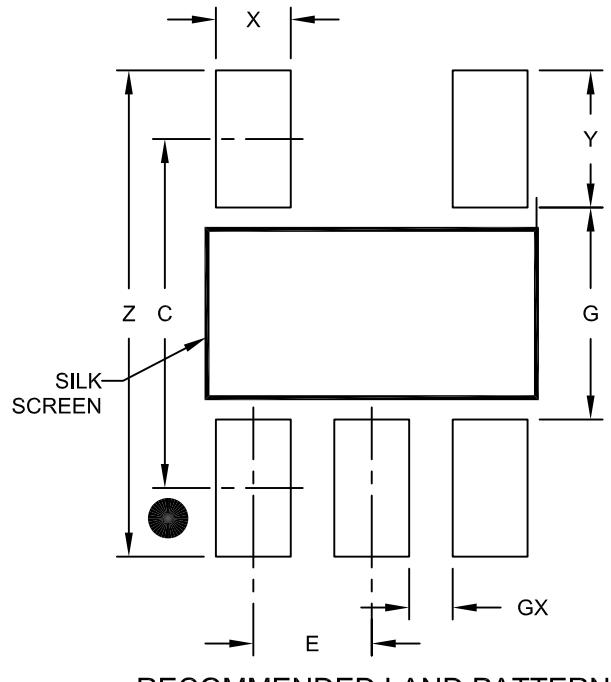
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-091B

Land Pattern (Footprint)

5-Lead Plastic Small Outline Transistor (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 |
| Contact Pitch | E | 0.95 | BSC | |
| Contact Pad Spacing | C | | 2.80 | |
| Contact Pad Width (X5) | X | | | 0.60 |
| Contact Pad Length (X5) | Y | | | 1.10 |
| Distance Between Pads | G | 1.70 | | |
| Distance Between Pads | GX | 0.35 | | |
| Overall Width | Z | | | 3.90 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

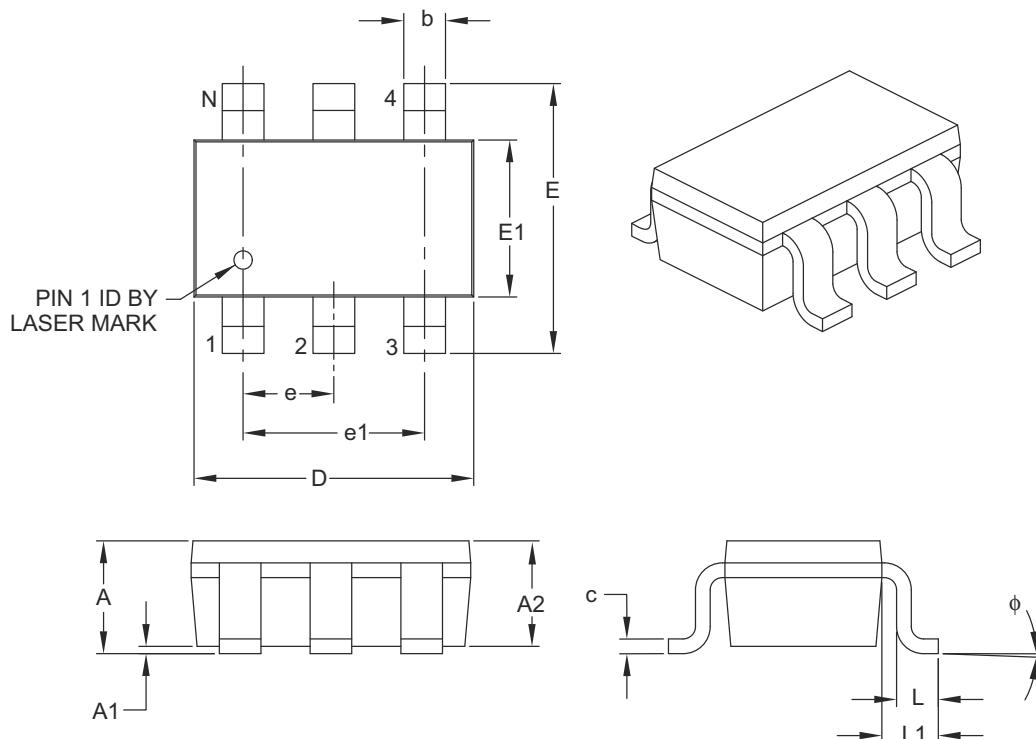
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2091A

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.

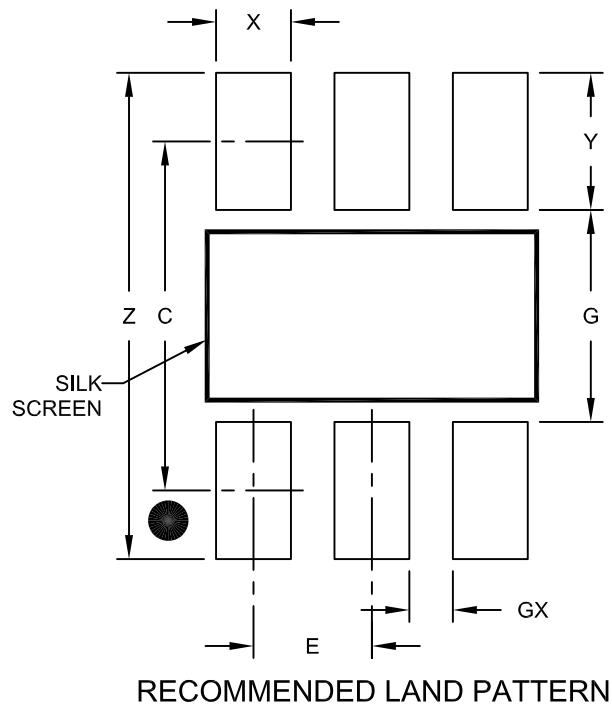
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-028B

Land Pattern (Footprint)

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 |
| Contact Pitch | E | 0.95 | BSC | |
| Contact Pad Spacing | C | | 2.80 | |
| Contact Pad Width (X6) | X | | | 0.60 |
| Contact Pad Length (X6) | Y | | | 1.10 |
| Distance Between Pads | G | 1.70 | | |
| Distance Between Pads | GX | 0.35 | | |
| Overall Width | Z | | | 3.90 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

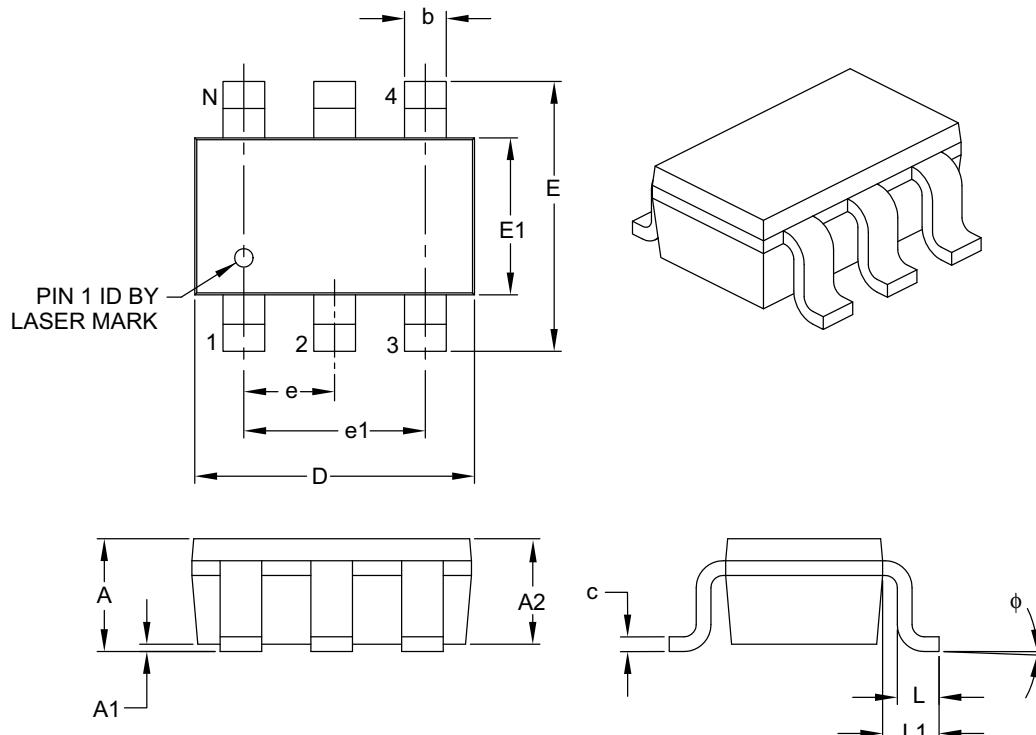
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2028A

Packaging Diagrams and Parameters

6-Lead Plastic Small Outline Transistor (CHY) [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:

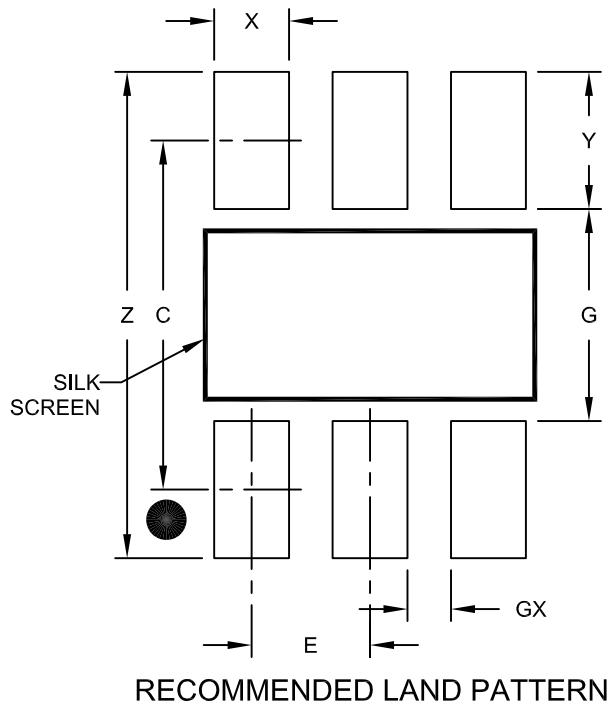
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Land Pattern (Footprint)

6-Lead Plastic Small Outline Transistor (CHY) [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 |
| Contact Pitch | E | | | | 0.95 | BSC | |
| Contact Pad Spacing | C | | | | 2.80 | | |
| Contact Pad Width (X6) | X | | | | | 0.60 | |
| Contact Pad Length (X6) | Y | | | | | 1.10 | |
| Distance Between Pads | G | 1.70 | | | | | |
| Distance Between Pads | GX | 0.35 | | | | | |
| Overall Width | Z | | | | 3.90 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

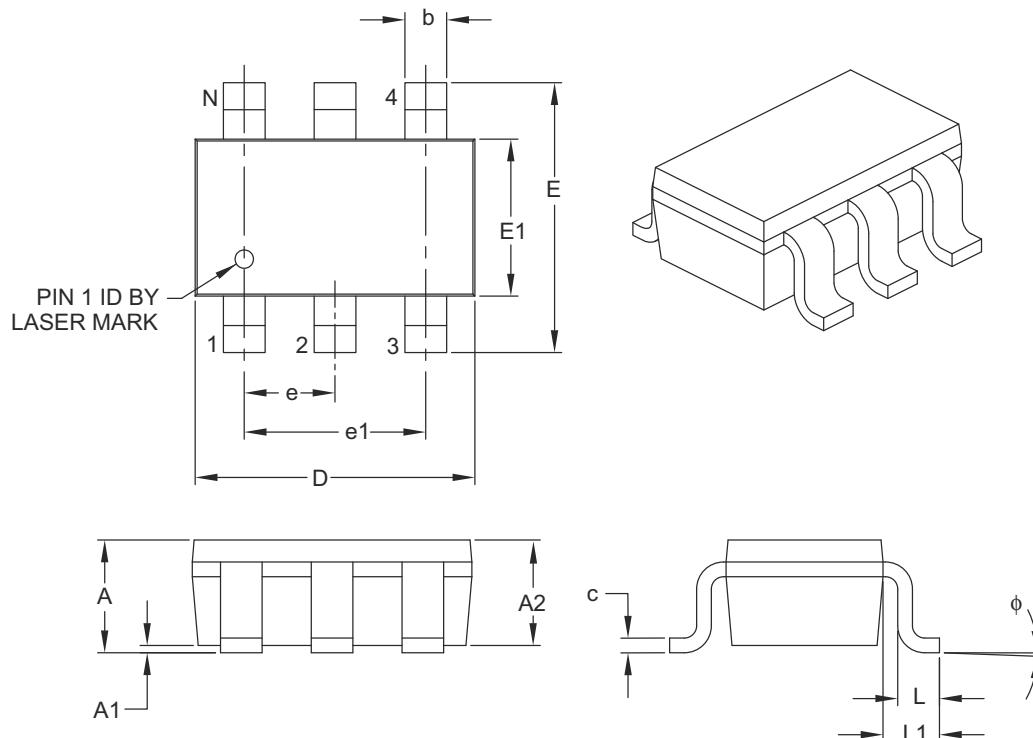
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2028A

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:

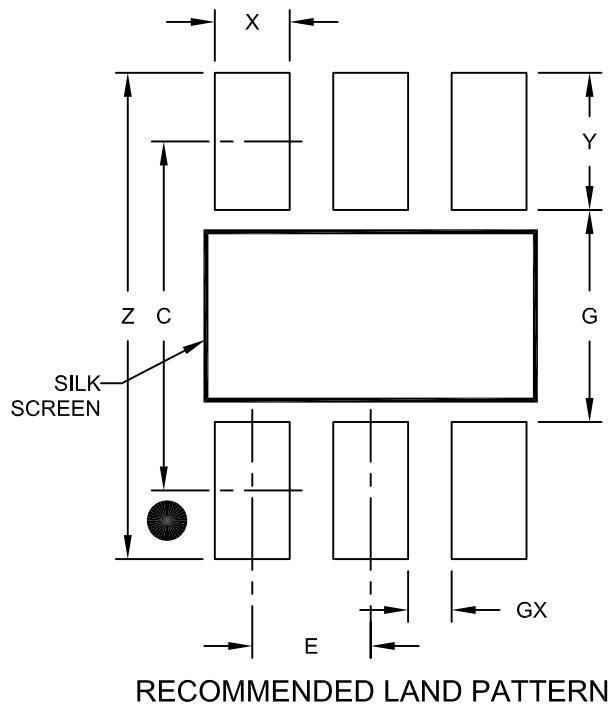
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Land Pattern (Footprint)

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 |
| Contact Pitch | E | 0.95 BSC | | | | | |
| Contact Pad Spacing | C | | | 2.80 | | | |
| Contact Pad Width (X6) | X | | | 0.60 | | | |
| Contact Pad Length (X6) | Y | | | 1.10 | | | |
| Distance Between Pads | G | 1.70 | | | | | |
| Distance Between Pads | GX | 0.35 | | | | | |
| Overall Width | Z | | | 3.90 | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

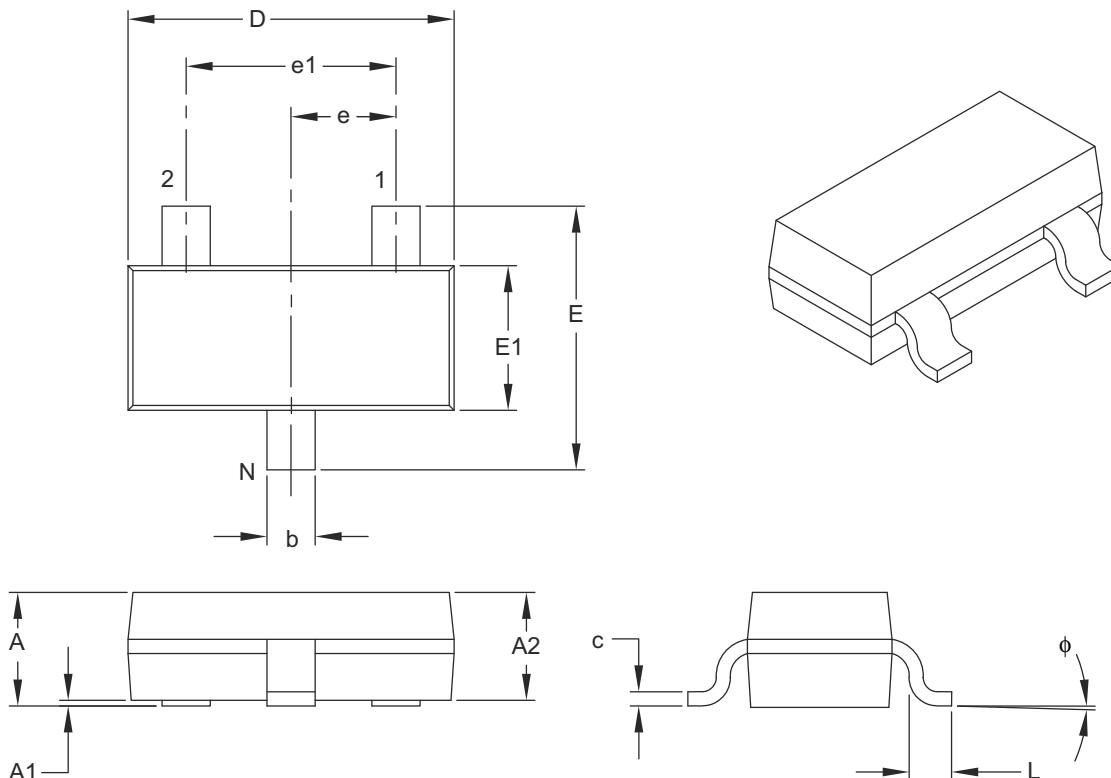
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2028A

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>



| 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 | — | 1.45 |
| 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:

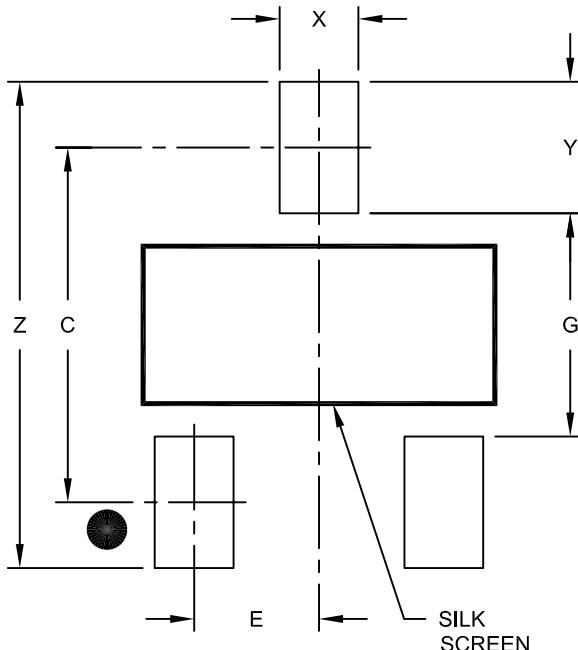
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| | | Units | MILLIMETERS | | |
|-------------------------|---|-------|-------------|------|------|
| Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | E | | 0.95 | BSC | |
| Contact Pad Spacing | C | | | 2.70 | |
| Contact Pad Width (X3) | X | | | | 0.60 |
| Contact Pad Length (Y3) | Y | | | | 1.00 |
| Distance Between Pads | G | 1.70 | | | |
| Overall Width | Z | | | | 3.70 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

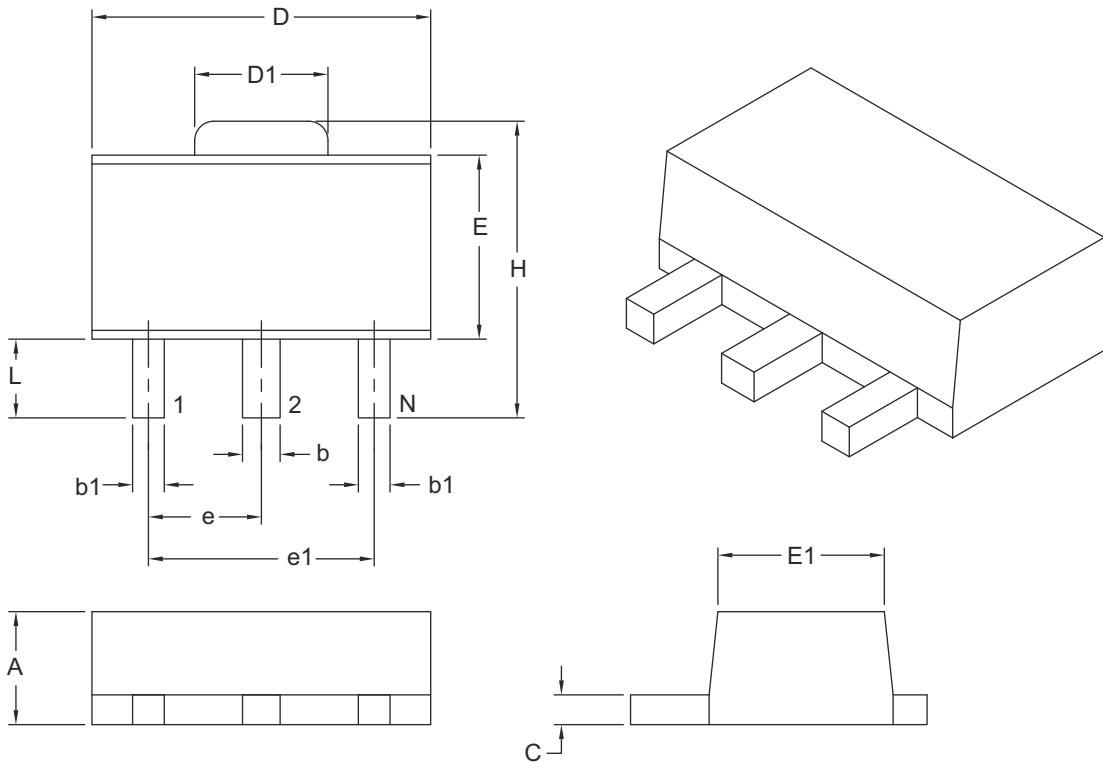
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2130A

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:

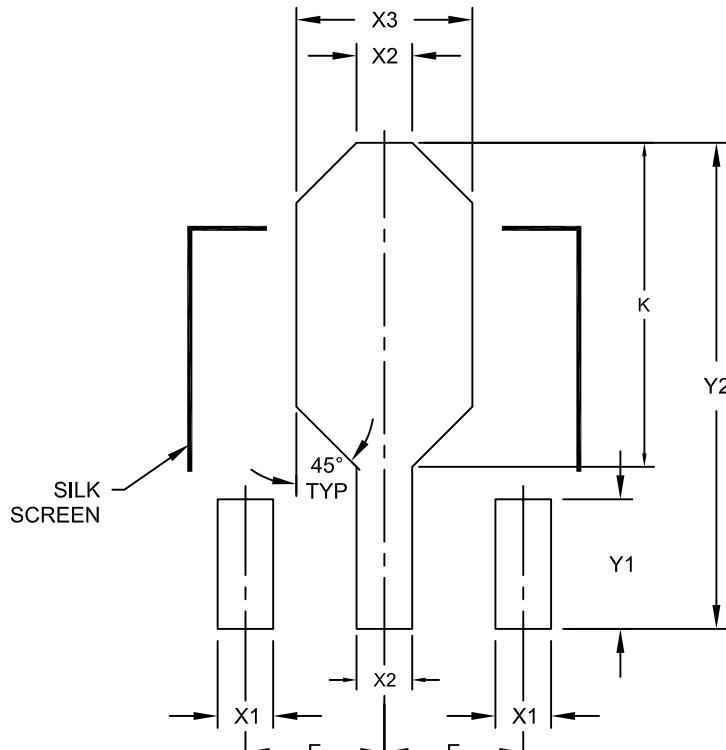
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Dimension Limits | | MILLIMETERS | | |
|---------------------------|----|-------------|----------|------|
| | | MIN | NOM | MAX |
| Contact Pitch | E | | 1.50 BSC | |
| Contact Pads 1 & 3 Width | X1 | | | 0.48 |
| Contact Pad 2 Width | X2 | | | 0.56 |
| Heat Slug Pad Width | X3 | | | 1.20 |
| Contact Pads 1 & 3 Length | Y1 | | 1.40 | |
| Contact 2 Pad Length | Y2 | | | 4.25 |
| - | K | 2.60 | | 2.85 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

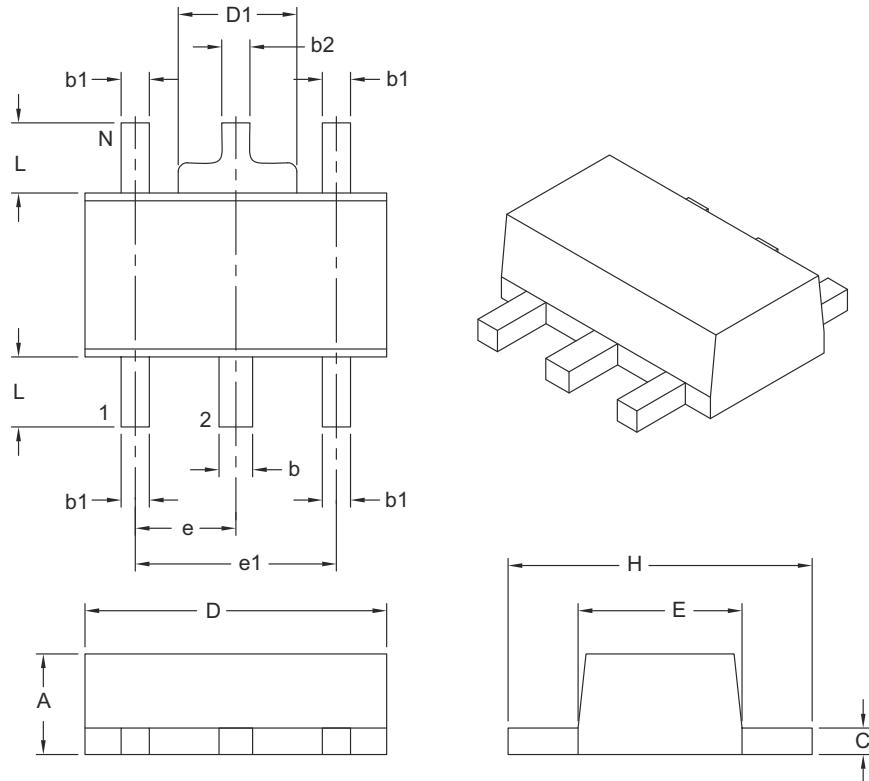
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2029A

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 | |
|-------------------------|----|-------|-------------|-----|
| Dimension Limits | | | 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:

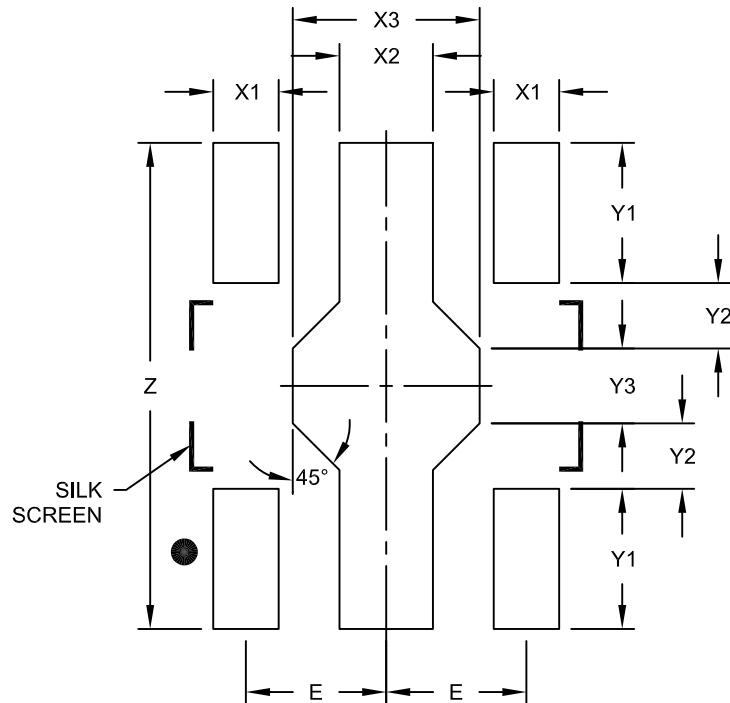
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|-------------------------|----|-------------|----------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | | 1.50 BSC | |
| Contact Pad Width (X4) | X1 | | | 0.70 |
| Contact Pad Width | X2 | | 1.00 | |
| Contact Pad Width | X3 | | 2.00 | |
| Contact Pad Length (X4) | Y1 | | 1.50 | |
| Contact Pad Length (X2) | Y2 | | 0.70 | |
| Contact Pad Length | Y3 | | 0.80 | |
| Overall Length | Z | | 5.20 | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

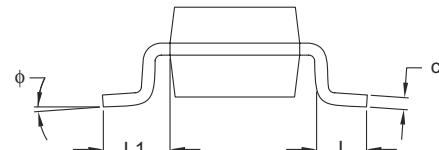
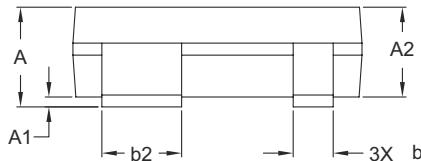
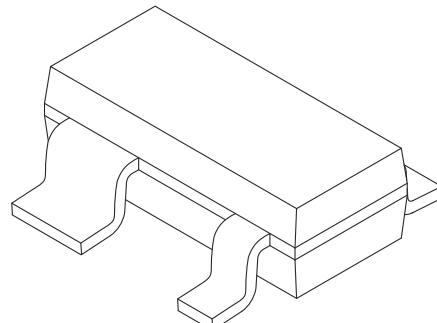
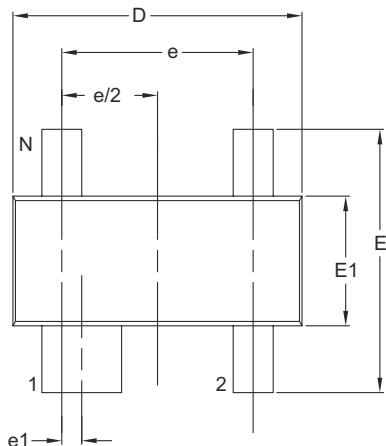
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2030C

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>



| Dimension Limits | Units | MILLIMETERS | | |
|--------------------------|-------|-------------|----------|------|
| | | MIN | NOM | MAX |
| Number of Pins | N | | 4 | |
| Pitch | e | | 1.92 BSC | |
| Lead 1 Offset | e1 | | 0.20 BSC | |
| Overall Height | A | 0.80 | — | 1.22 |
| Molded Package Thickness | A2 | 0.75 | 0.90 | 1.07 |
| Standoff § | A1 | 0.01 | — | 0.15 |
| Overall Width | E | 2.10 | — | 2.64 |
| Molded Package Width | E1 | 1.20 | 1.30 | 1.40 |
| Overall Length | D | 2.67 | 2.90 | 3.05 |
| Foot Length | L | 0.13 | 0.50 | 0.60 |
| Footprint | L1 | 0.54 REF | | |
| Foot Angle | ϕ | 0° | — | 8° |
| Lead Thickness | c | 0.08 | — | 0.20 |
| Lead 1 Width | b1 | 0.76 | — | 0.94 |
| Leads 2, 3 & 4 Width | b | 0.30 | — | 0.54 |

Notes:

- § Significant Characteristic.
- 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.

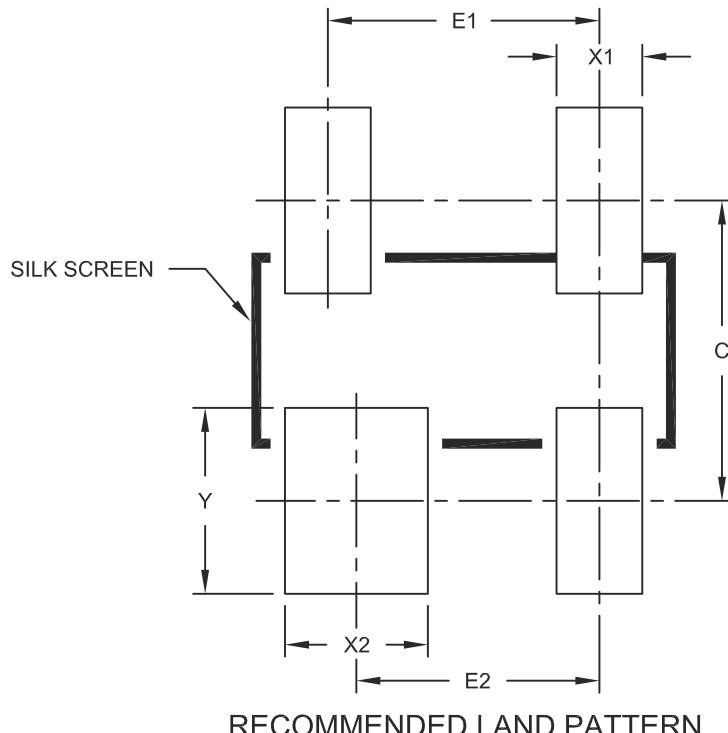
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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>



| | | Units | MILLIMETERS | | |
|---------------------|----|-------|-------------|-----|------|
| Dimension Limits | | | 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

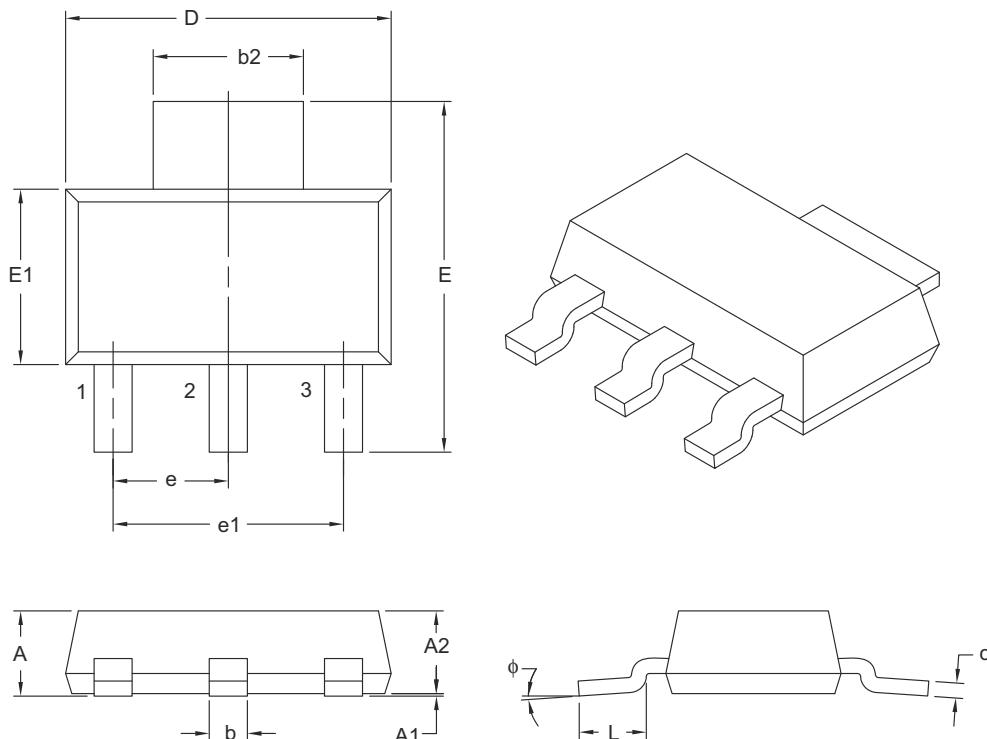
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2031A

Packaging Diagrams and Parameters

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>



| Units | | MILLIMETERS | | |
|-----------------------|----|-------------|----------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Number of Leads | N | | 3 | |
| Lead Pitch | e | | 2.30 BSC | |
| Outside Lead Pitch | e1 | | 4.60 BSC | |
| Overall Height | A | — | — | 1.80 |
| Standoff | A1 | 0.02 | — | 0.10 |
| Molded Package Height | A2 | 1.50 | 1.60 | 1.70 |
| Overall Width | E | 6.70 | 7.00 | 7.30 |
| Molded Package Width | E1 | 3.30 | 3.50 | 3.70 |
| Overall Length | D | 6.30 | 6.50 | 6.70 |
| Lead Thickness | c | 0.23 | 0.30 | 0.35 |
| Lead Width | b | 0.60 | 0.76 | 0.84 |
| Tab Lead Width | b2 | 2.90 | 3.00 | 3.10 |
| Foot Length | L | 0.75 | — | — |
| Lead Angle | ϕ | 0° | — | 10° |

Notes:

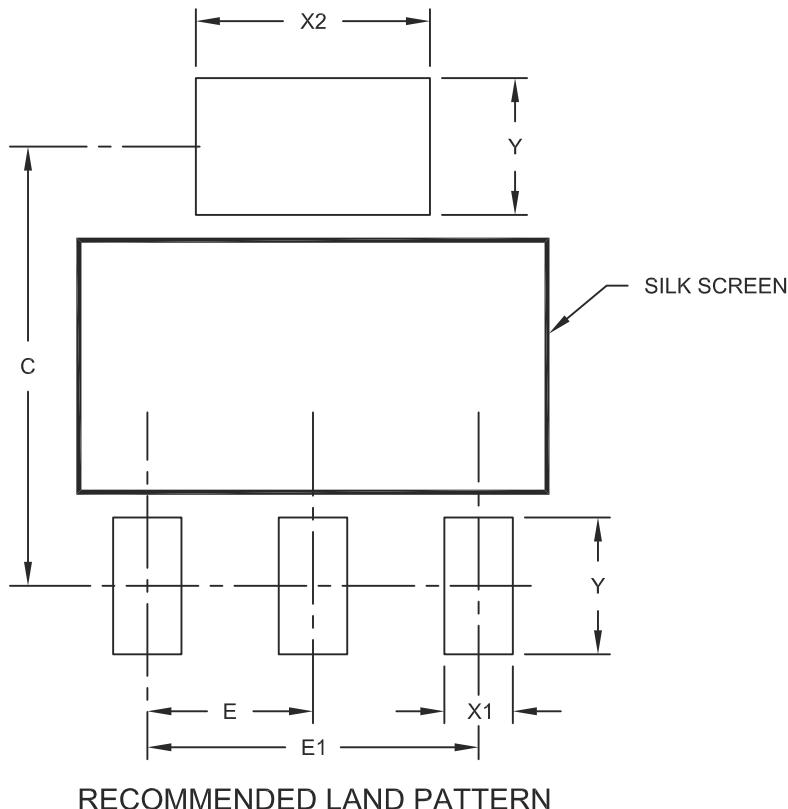
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

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>



| | | Units | MILLIMETERS | | |
|---------------------|----|-------|-------------|------|-----|
| Dimension Limits | | | 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

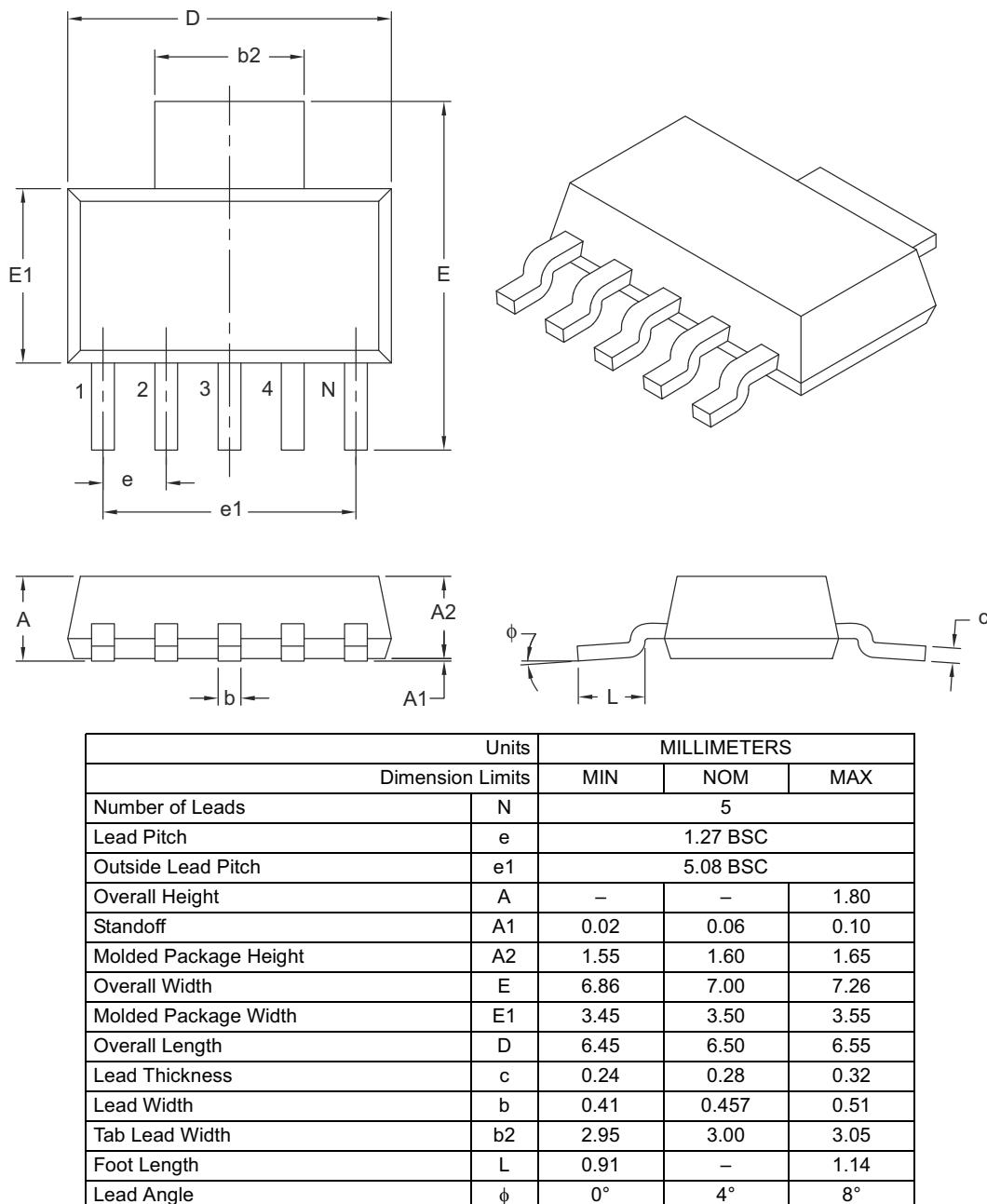
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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:

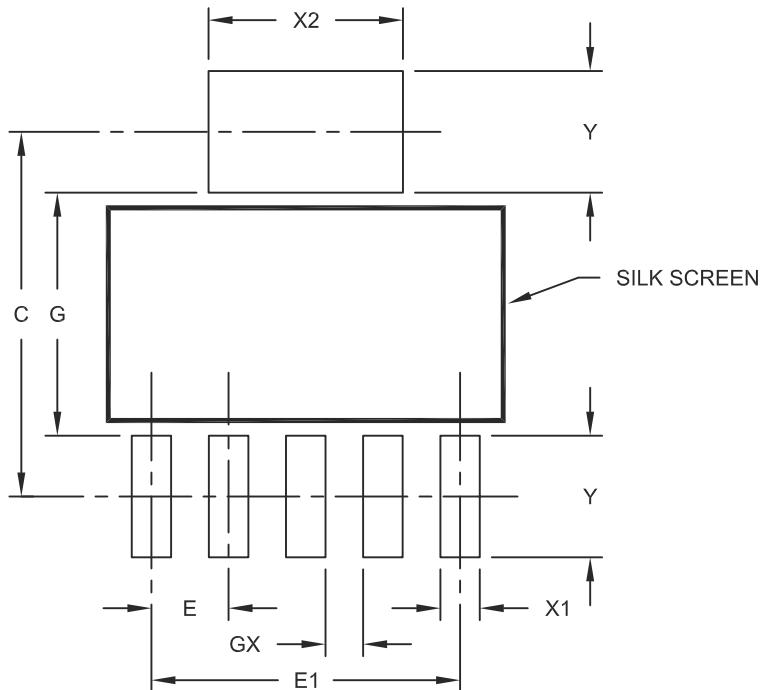
- Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.127 mm per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

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

| Units | | MILLIMETERS | | |
|-----------------------|----|-------------|------|------|
| Dimension Limits | | 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

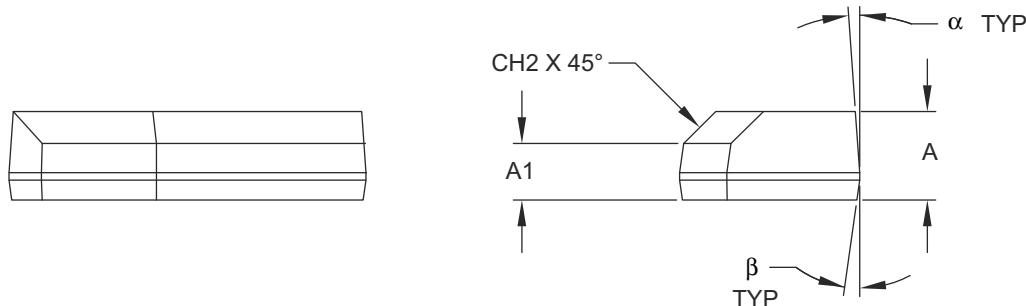
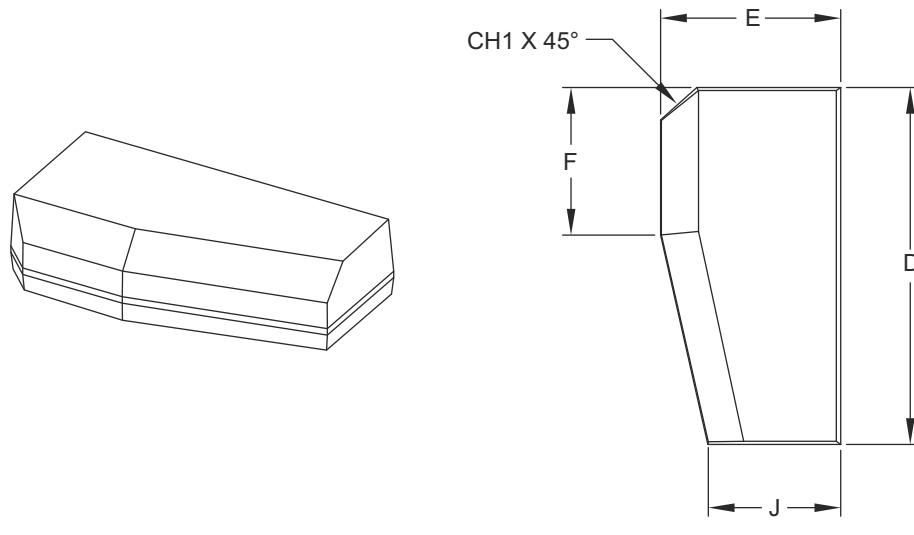
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2137A

Packaging Diagrams and Parameters

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° |

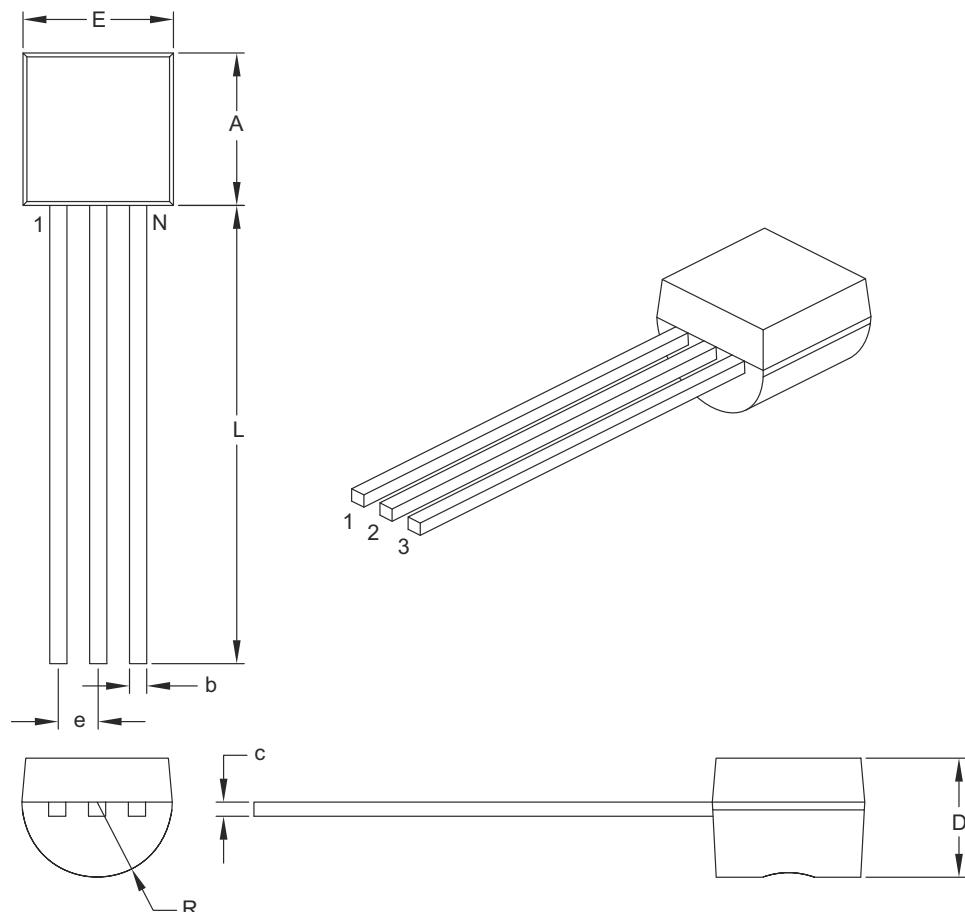
Note:

- 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.

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>



| | | Units | 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.

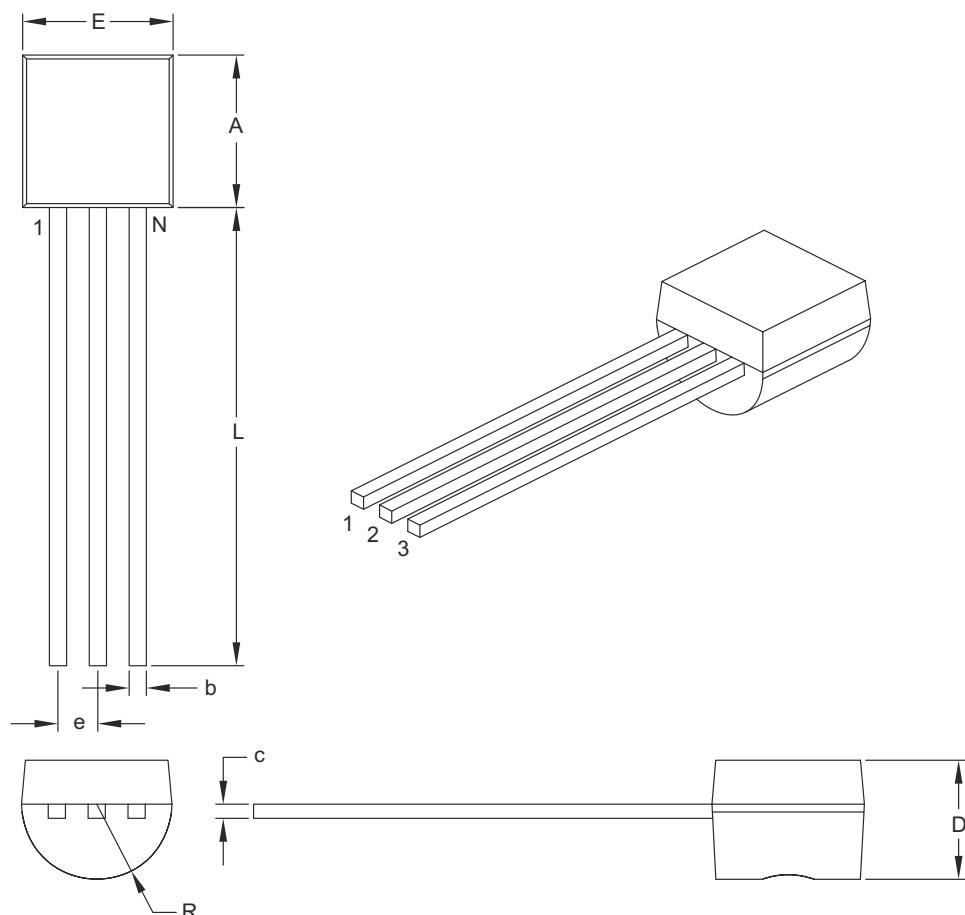
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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>



| Units | | 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:

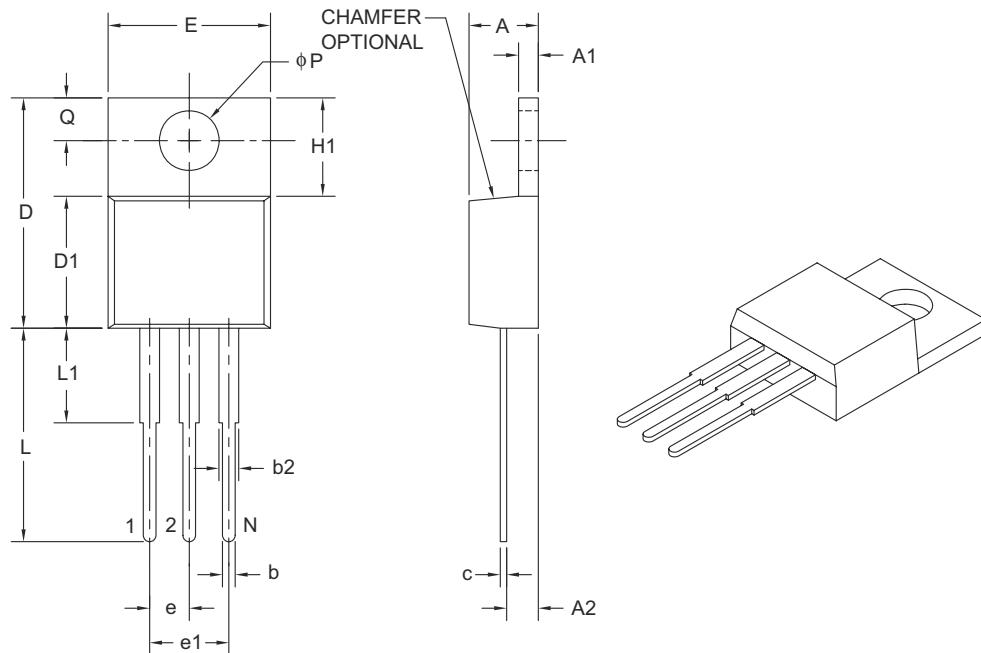
- Dimensions A and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

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.

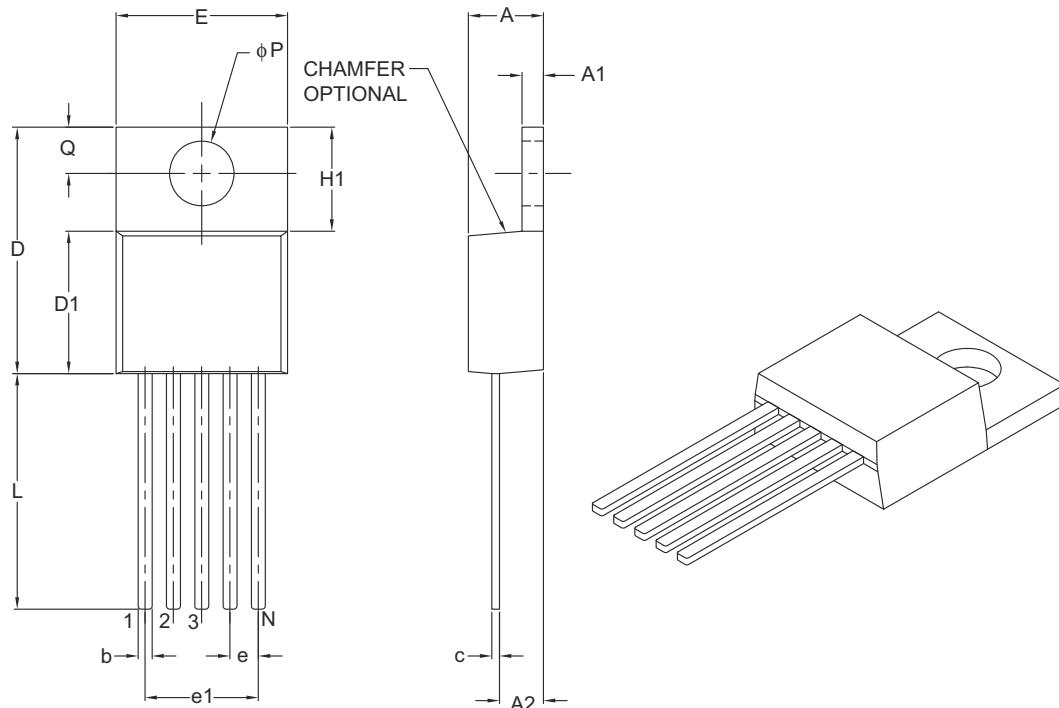
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-034B

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:

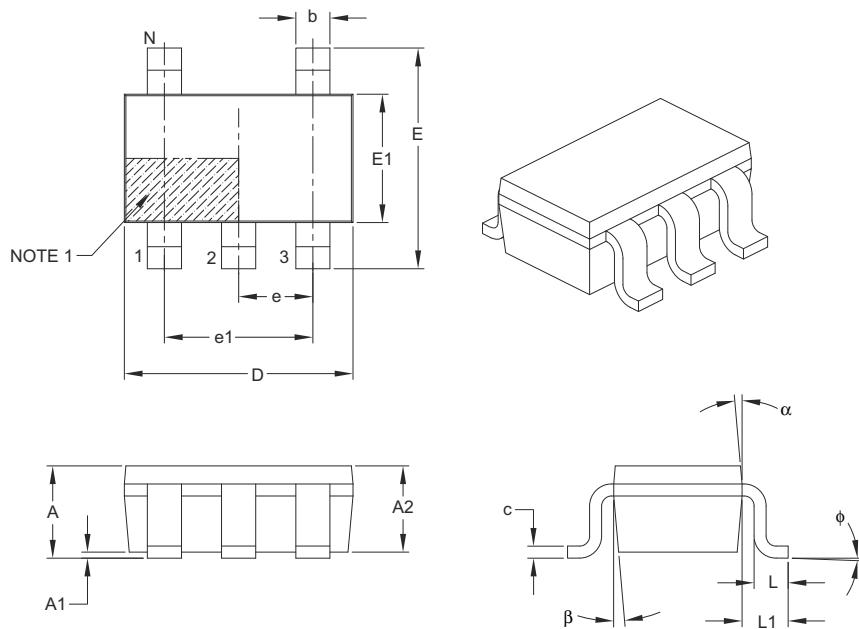
- Dimensions D and E do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .005" per side.
- Dimensioning and tolerancing per ASME Y14.5M.

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

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.

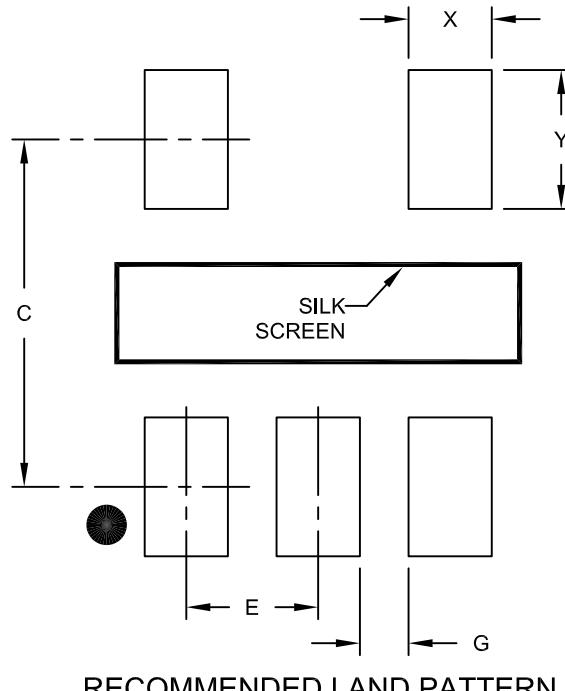
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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 |
| Contact Pitch | E | | 0.95 | BSC | |
| Contact Pad Spacing | C | | 2.80 | | |
| Contact Pad Width (X5) | X | | | 0.60 | |
| Contact Pad Length (X5) | Y | | | 1.10 | |
| Distance Between Pads | G | 0.35 | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

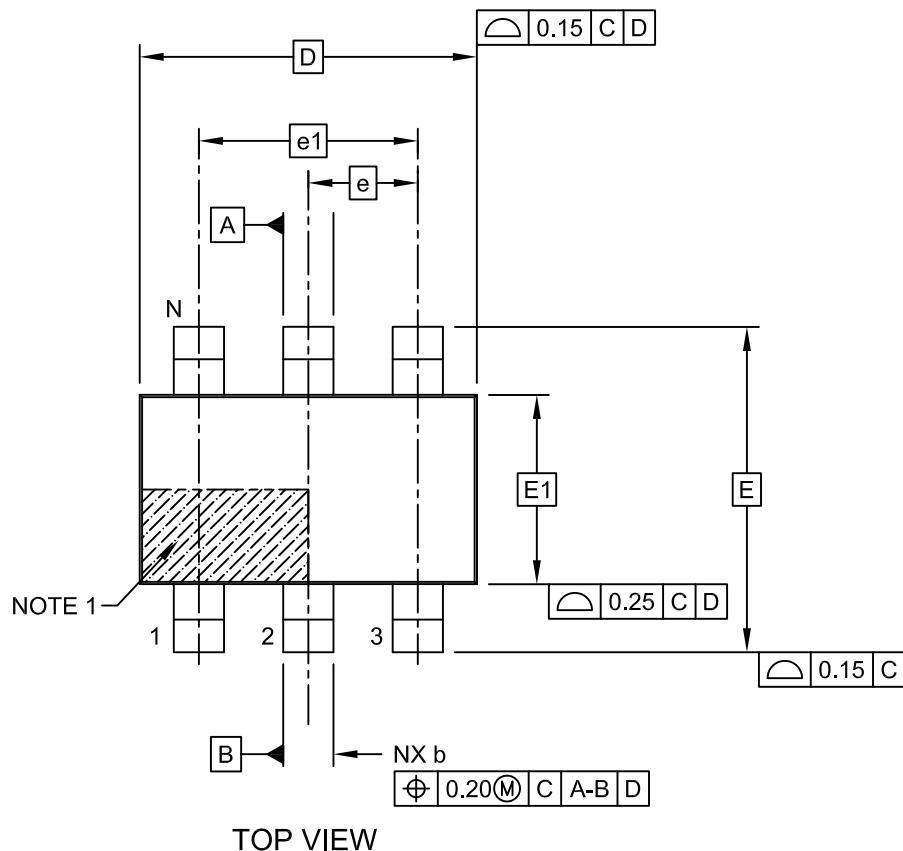
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2128A

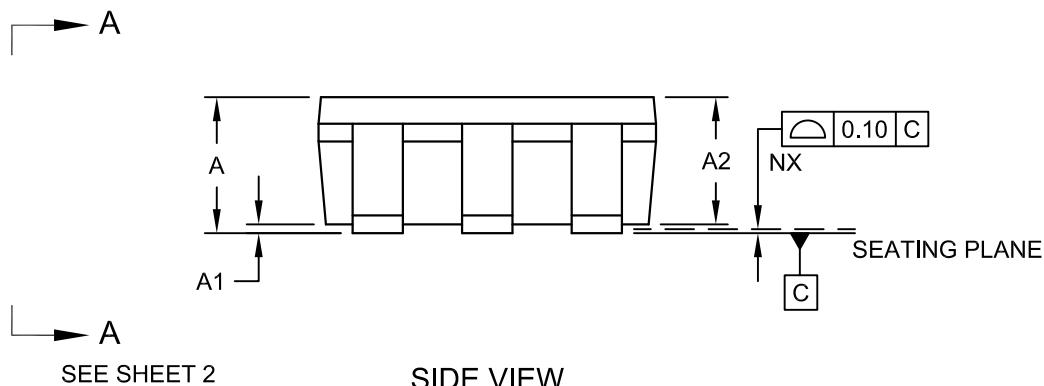
Packaging Diagrams and Parameters

6-Lead 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>



TOP VIEW



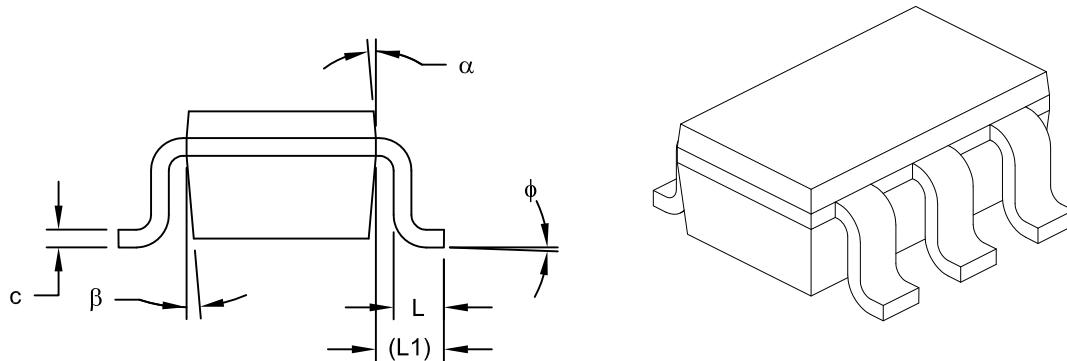
SEE SHEET 2

SIDE VIEW

Packaging Diagrams and Parameters

6-Lead 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>



VIEW A-A

| Dimension | Units | MILLIMETERS | | |
|--------------------------|-------|-------------|------|------|
| | | MIN | NOM | MAX |
| Number of Leads | N | 6 | | |
| 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 | theta | 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 0.15mm 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

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

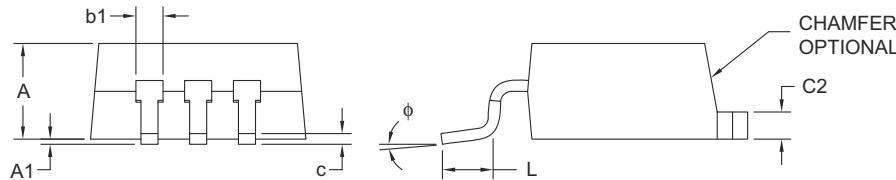
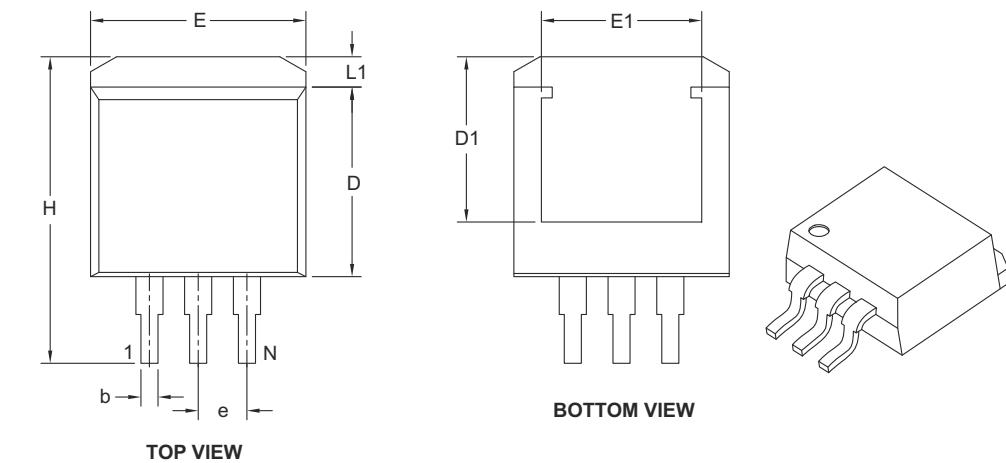
DDPAK Family

Double Deca-Watt Packages

Packaging Diagrams and Parameters

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.

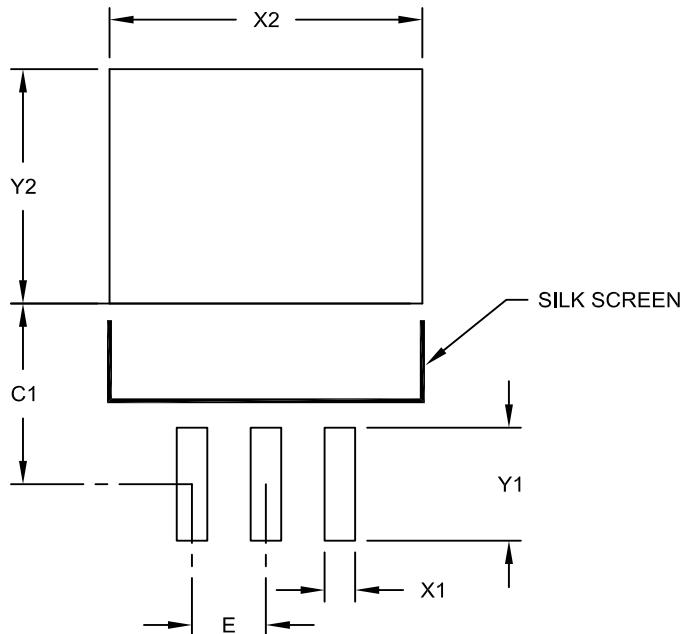
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-011B

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>



RECOMMENDED LAND PATTERN

| | | Units | | | INCHES | | |
|-------------------------|----|------------------|--|------|--------|-----|--|
| | | Dimension Limits | | MIN | NOM | MAX | |
| Contact Pitch | E | | | .100 | BSC | | |
| Pad Width | X2 | | | | .423 | | |
| Pad Length | Y2 | | | | .327 | | |
| Contact Pad Spacing | C1 | | | .252 | | | |
| Contact Pad Width (X3) | X1 | | | | .041 | | |
| Contact Pad Length (X3) | Y1 | | | | .157 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

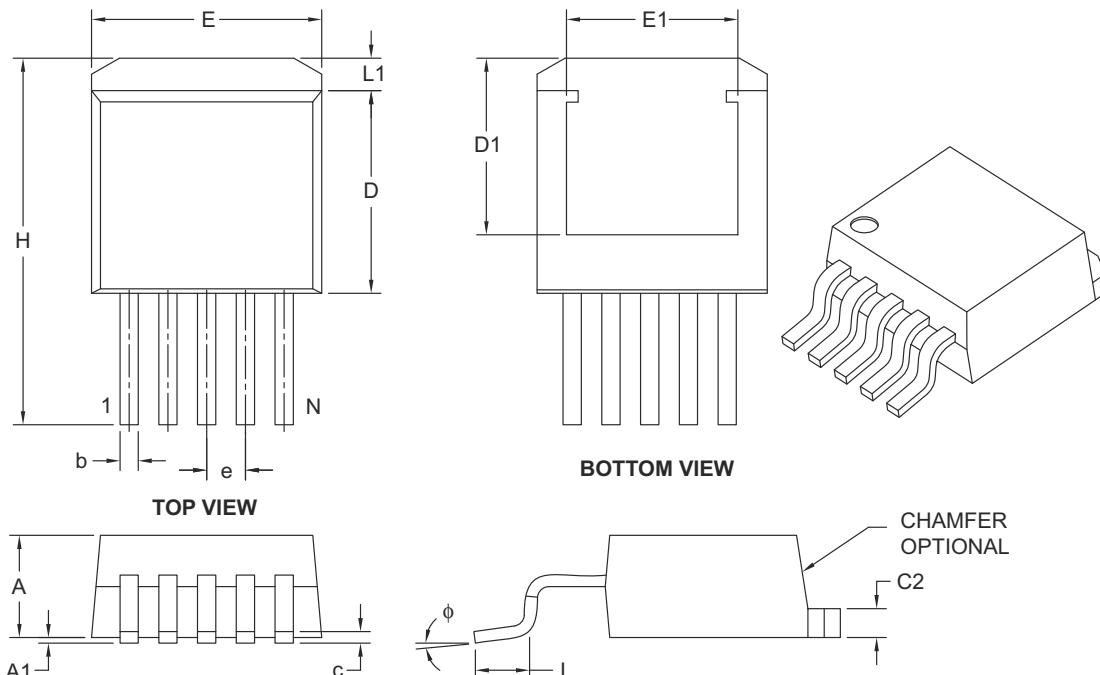
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2011A

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.

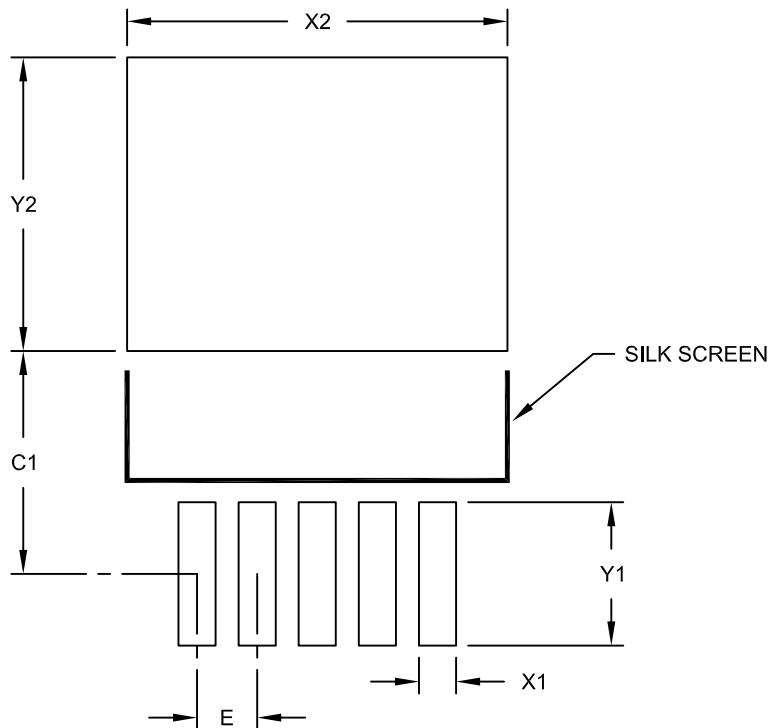
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-012B

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| | | Units | INCHES | | |
|----------------------------|----|-------|--------|------|-----|
| Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | E | | .067 | BSC | |
| Optional Center Pad Width | X2 | | | .423 | |
| Optional Center Pad Length | Y2 | | | .327 | |
| Contact Pad Spacing | C1 | | .248 | | |
| Contact Pad Width (X5) | X1 | | | .041 | |
| Contact Pad Length (X5) | Y1 | | | .159 | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

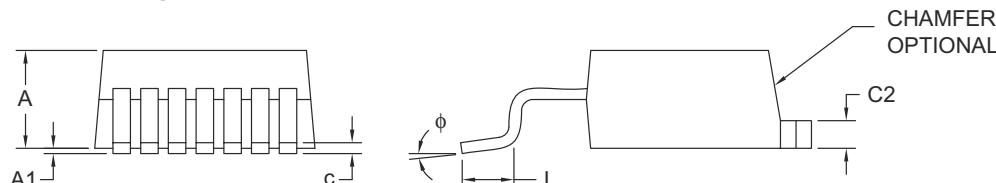
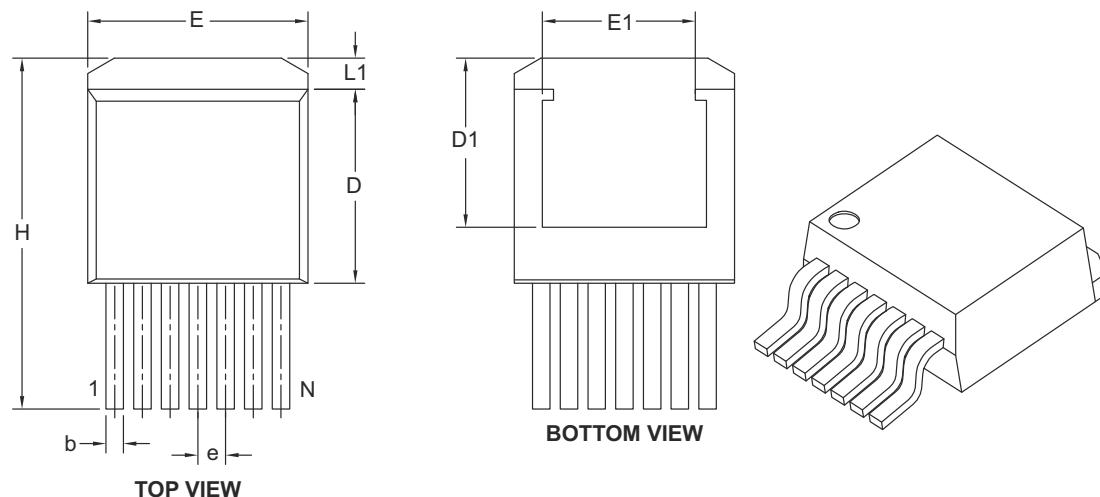
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2012A

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.

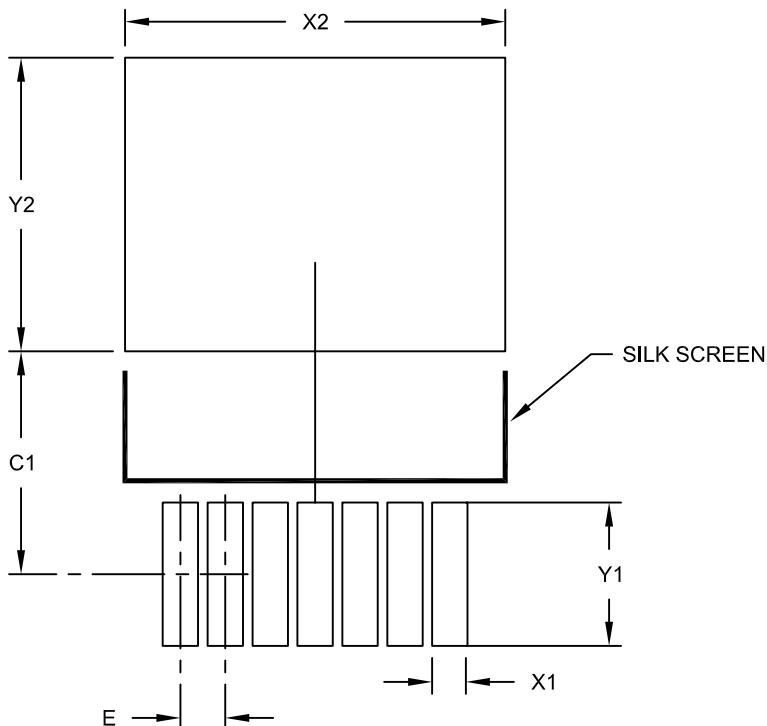
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-015B

Land Pattern (Footprint)

7-Lead Plastic (EK) [DDPAK]

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 (X7) | X1 | | | .039 |
| Contact Pad Length (X7) | Y1 | | | .159 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2015B

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

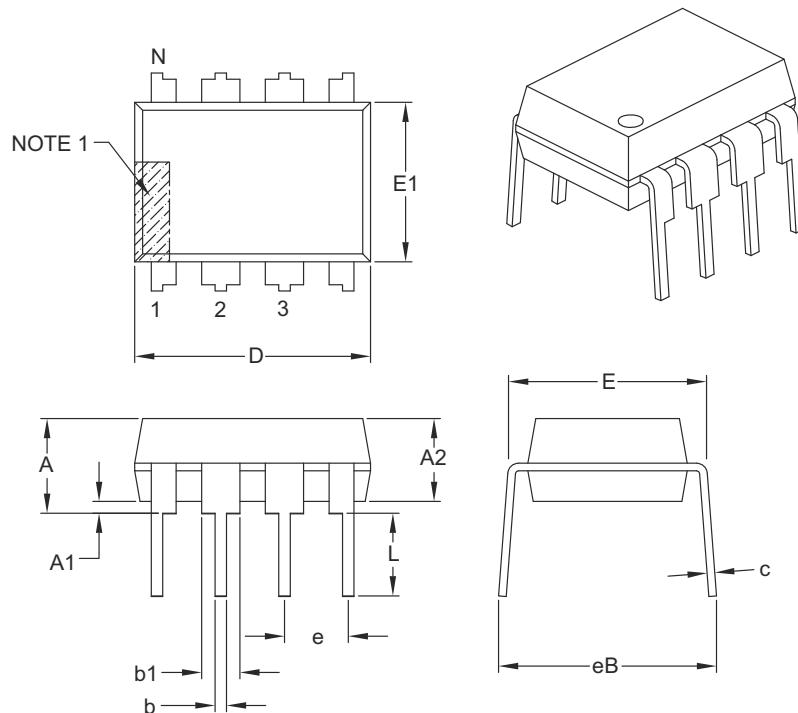
PDIP Family

Plastic Dual In-Line Packages

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:

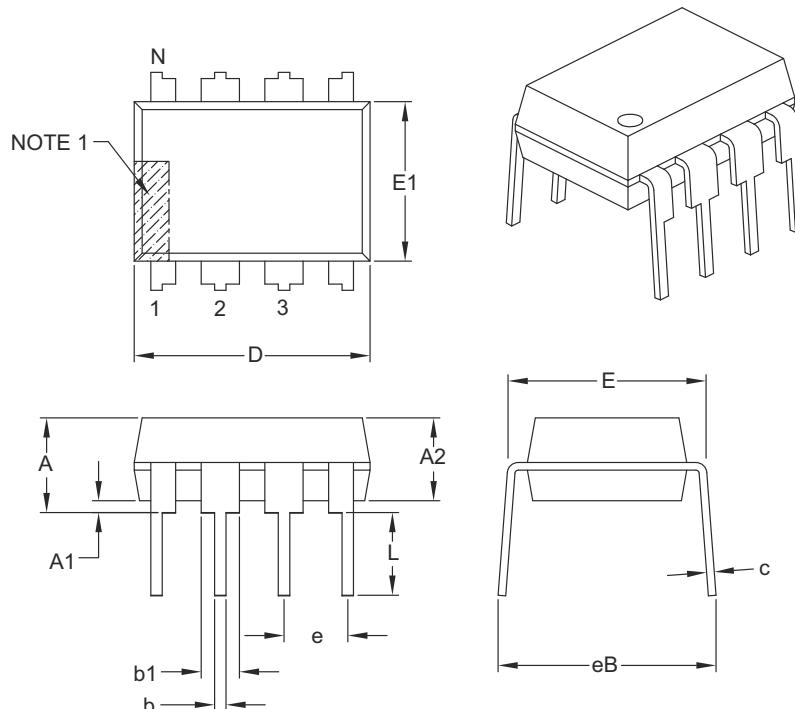
1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

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:

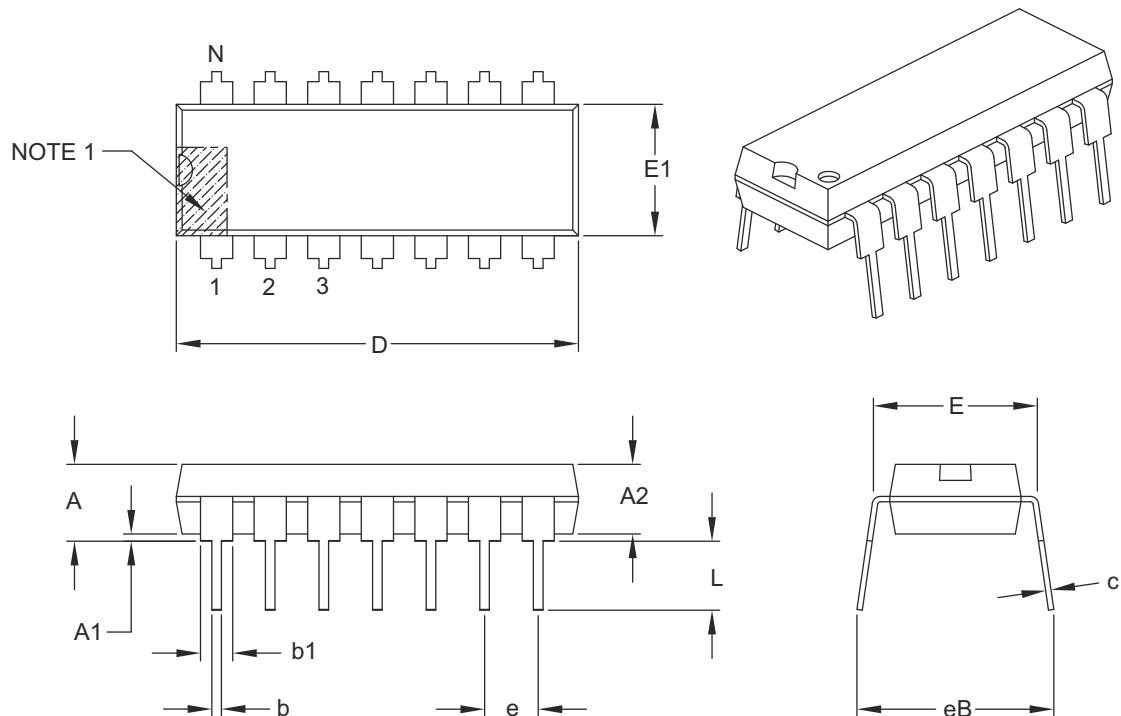
1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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:

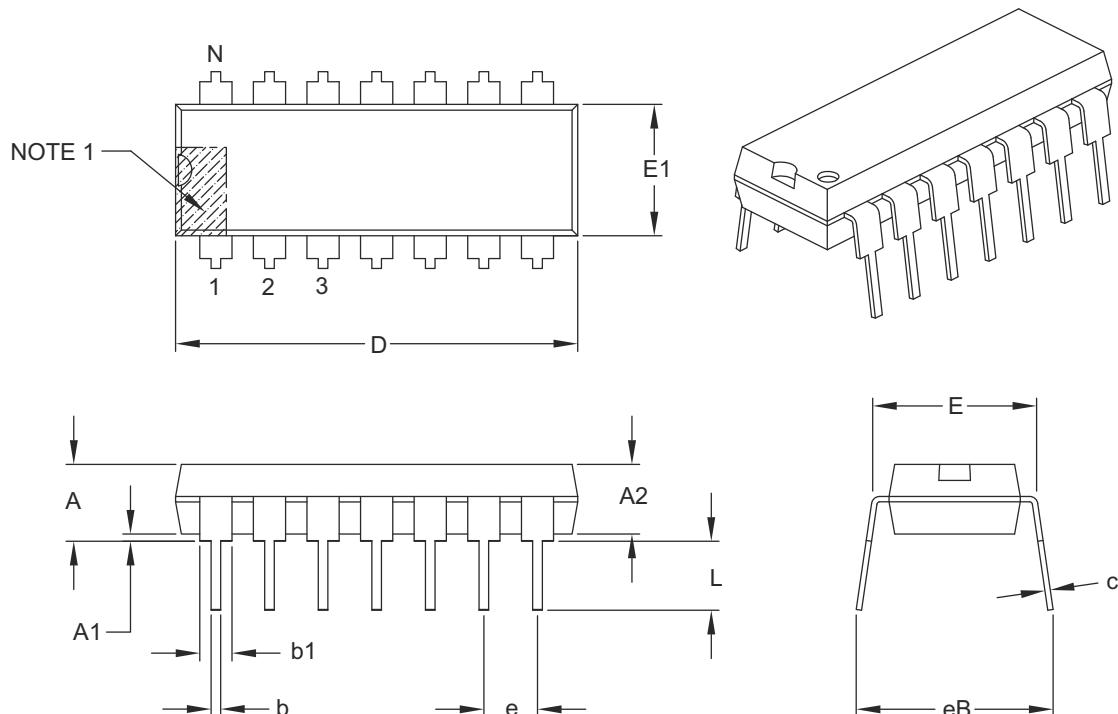
1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

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>



| 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:

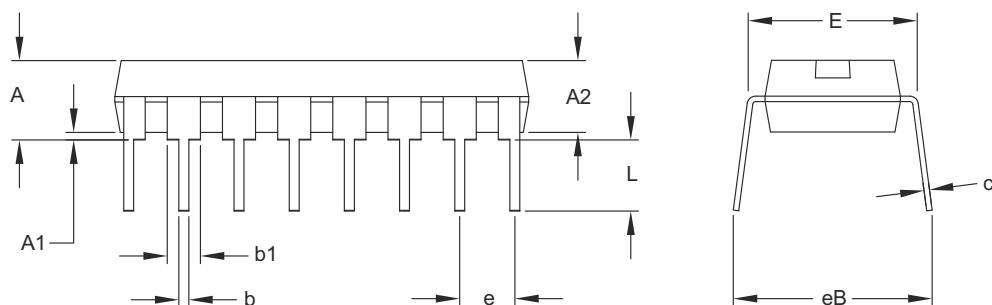
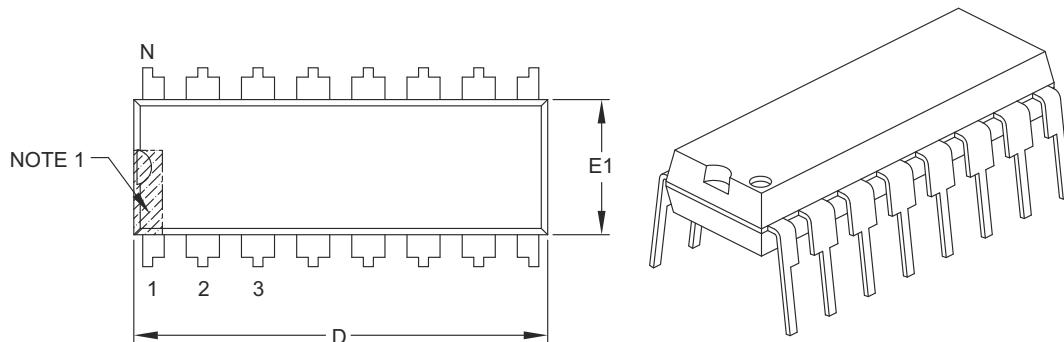
1. Pin 1 visual index feature may vary, but must be located with the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

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 | | 16 | | |
| Pitch | | .100 BSC | | |
| Top to Seating Plane | | A | – | .210 |
| Molded Package Thickness | | A2 | .115 | .130 |
| Base to Seating Plane | | A1 | .015 | – |
| Shoulder to Shoulder Width | | E | .290 | .310 |
| Molded Package Width | | E1 | .240 | .250 |
| Overall Length | | D | .735 | .755 |
| Tip to Seating Plane | | L | .115 | .130 |
| Lead Thickness | | c | .008 | .010 |
| Upper Lead Width | | b1 | .045 | .060 |
| Lower Lead Width | | b | .014 | .018 |
| 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.

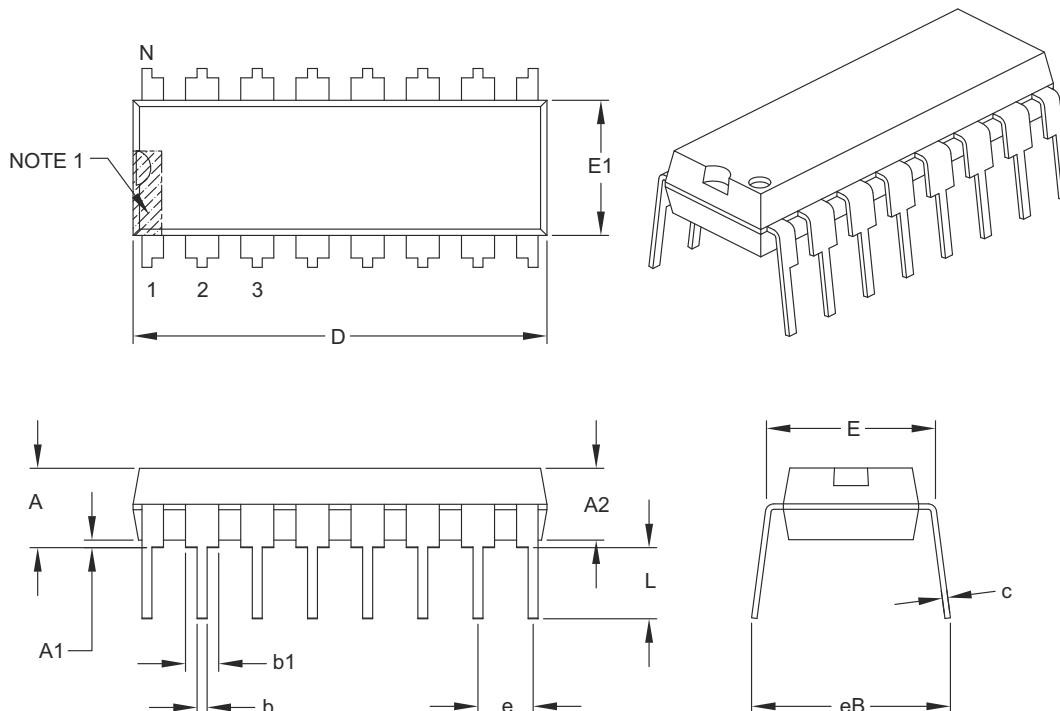
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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:

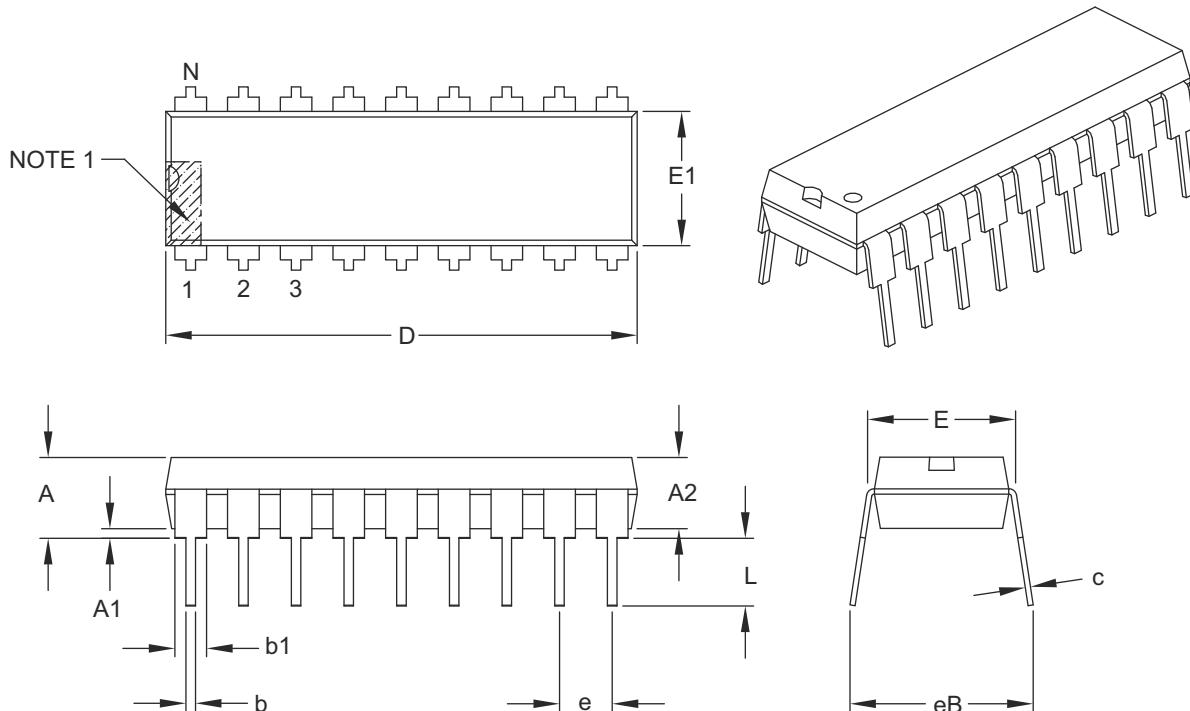
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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:

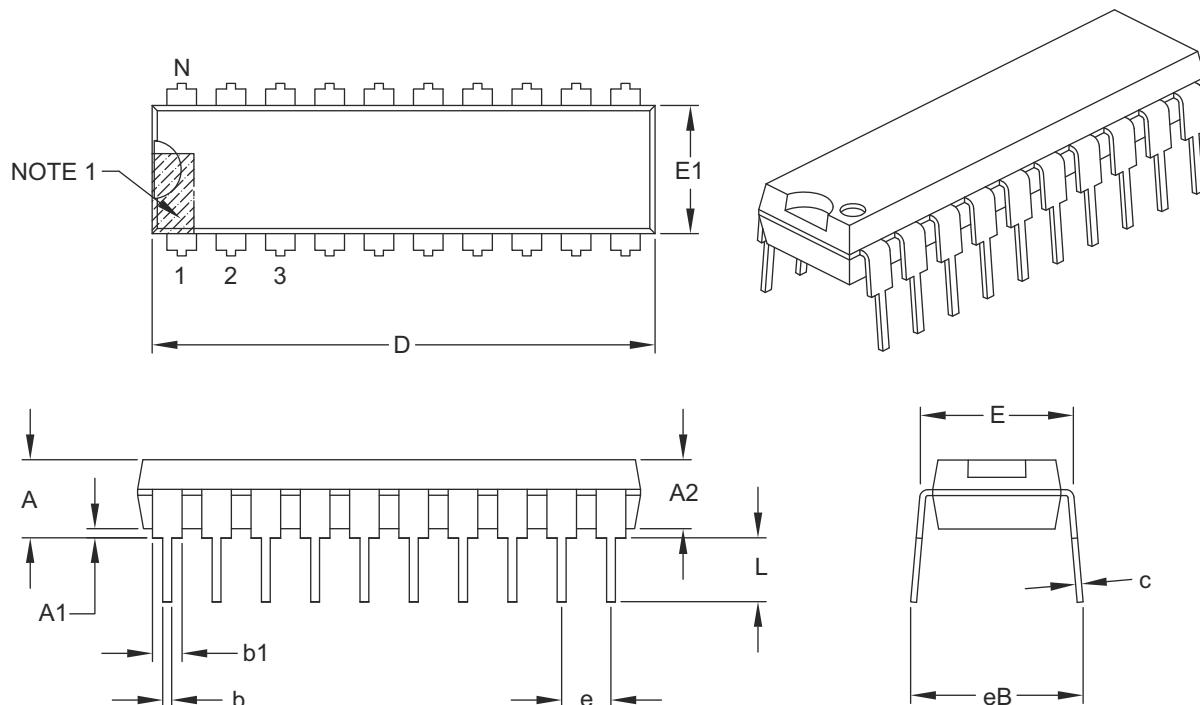
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

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>



| | | Units | INCHES | | |
|----------------------------|----|-------|--------|----------|-----|
| Dimension Limits | | | 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:

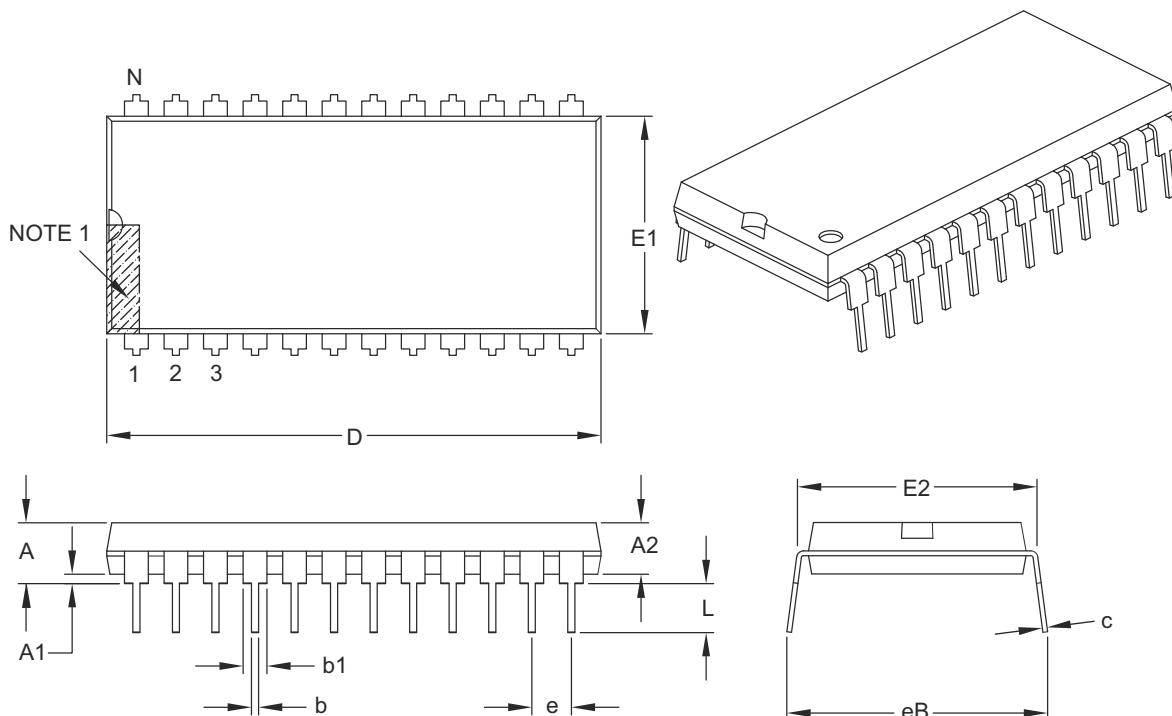
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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.

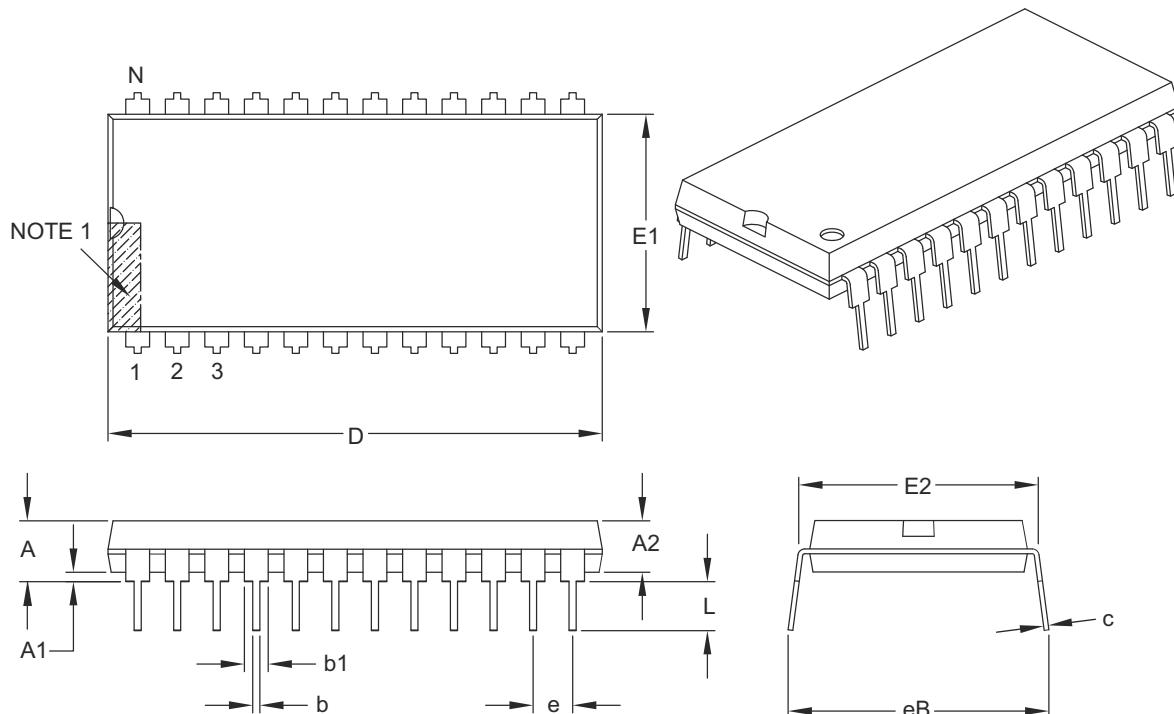
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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:

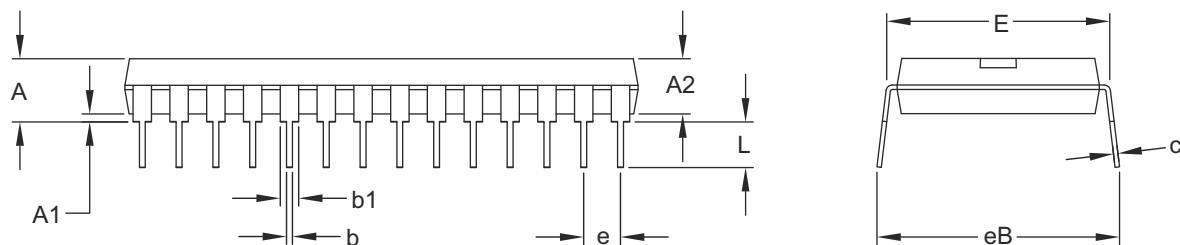
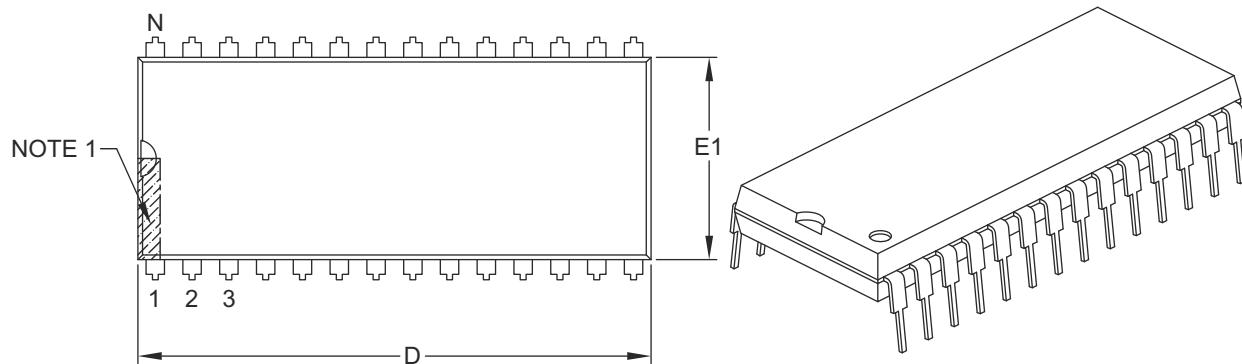
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

Packaging Diagrams and Parameters

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 | | 28 | | |
| Pitch | | .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.

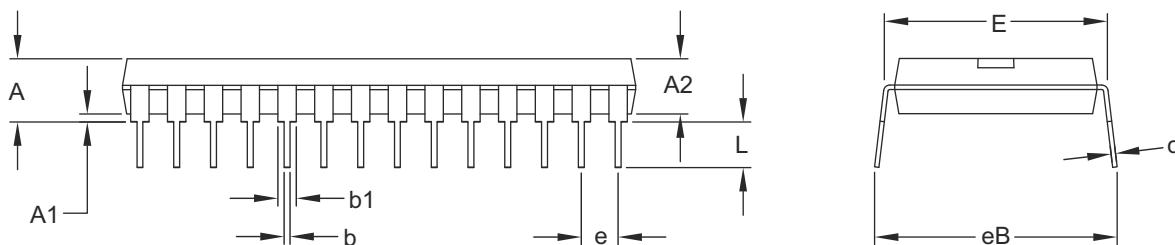
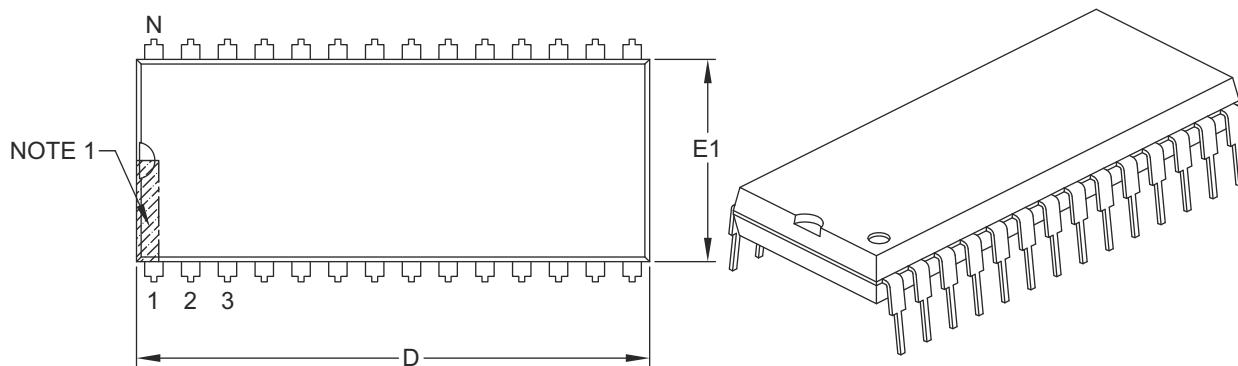
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-079B

Packaging Diagrams and Parameters

28-Lead Plastic Dual In-Line (PI) – 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:

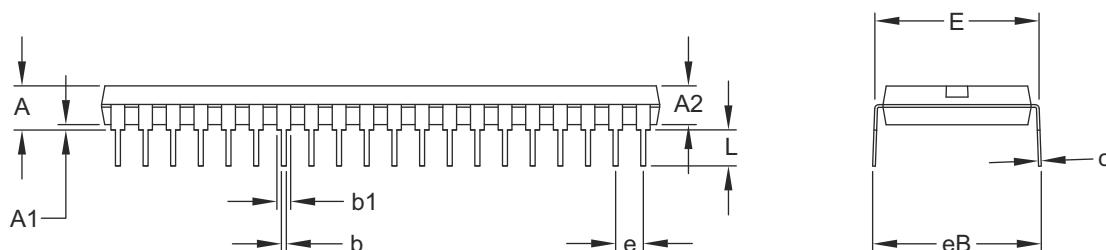
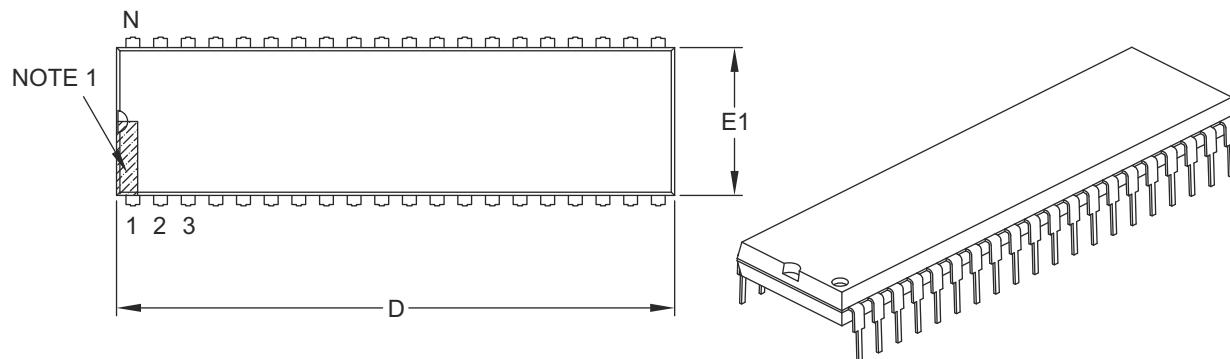
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

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.

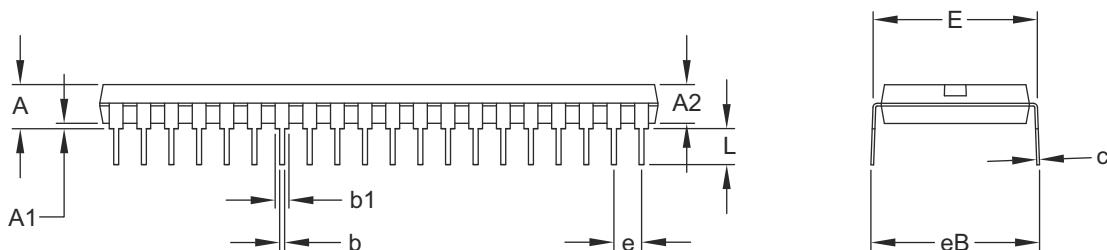
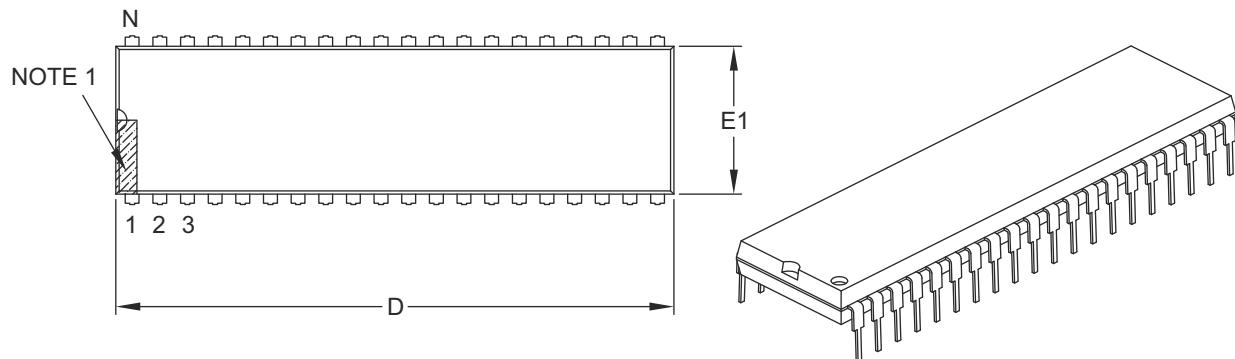
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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:

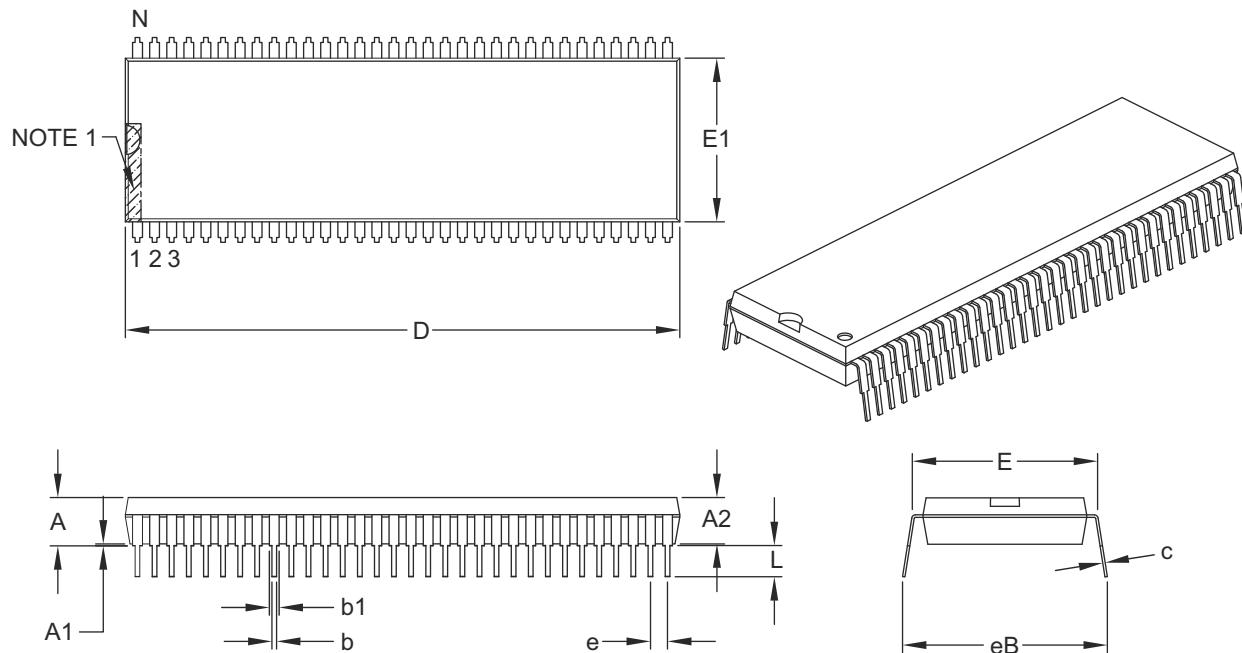
1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. § Significant Characteristic.
3. Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010" per side.
4. Dimensioning and tolerancing per ASME Y14.5M.

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

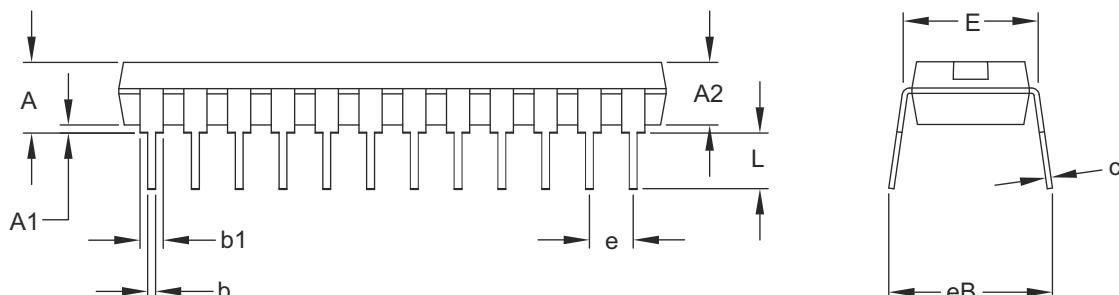
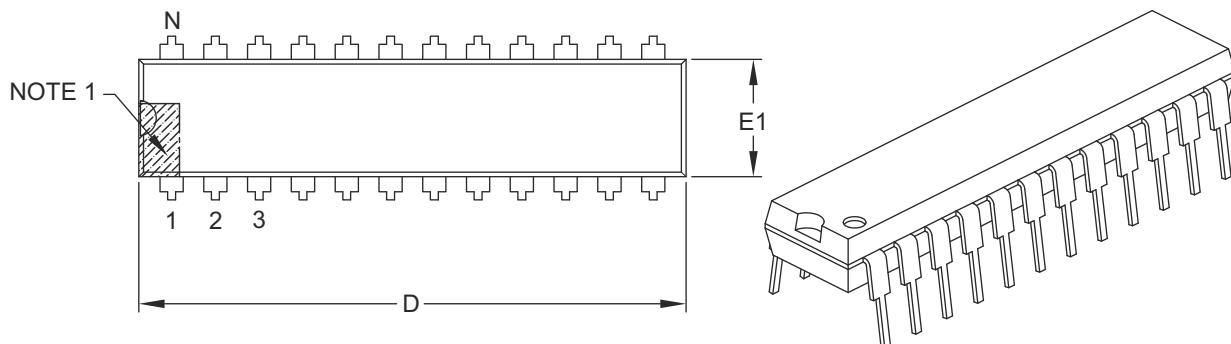
SPDIP Family

Skinny Plastic Dual In-Line Packages

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.

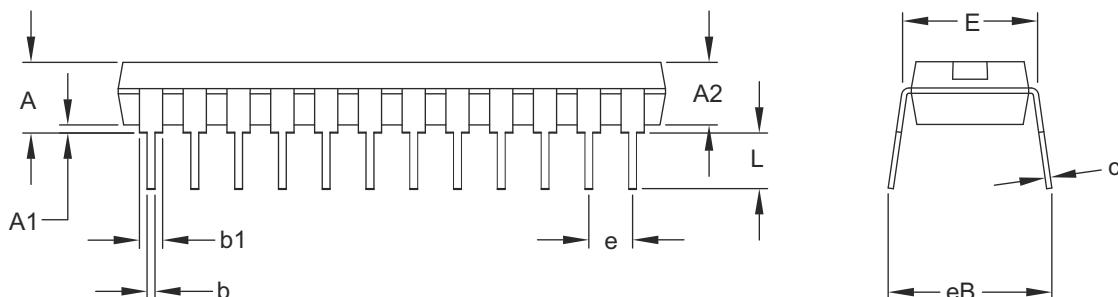
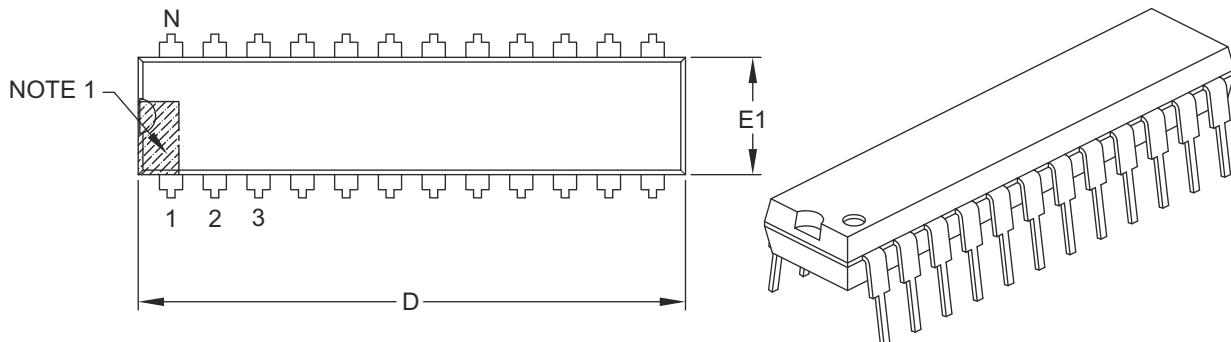
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-043B

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 | | |
| Pitch | | e | | |
| Top to Seating Plane | | A | — | .210 |
| Molded Package Thickness | | A2 | .115 | .130 |
| Base to Seating Plane | | A1 | .015 | — |
| Shoulder to Shoulder Width | | E | .280 | .325 |
| Molded Package Width | | E1 | .240 | .250 |
| Overall Length | | D | 1.155 | 1.250 |
| Tip to Seating Plane | | L | .115 | .160 |
| Lead Thickness | | c | .008 | .010 |
| Upper Lead Width | | b1 | .045 | .060 |
| Lower Lead Width | | b | .014 | .018 |
| 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.

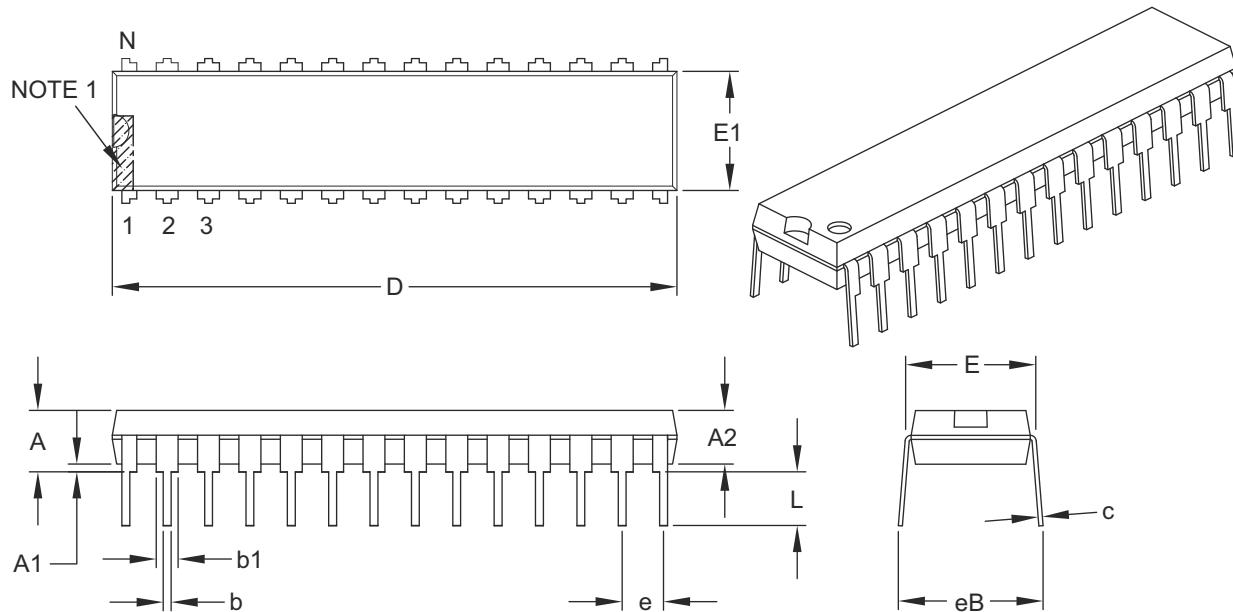
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-043B

Packaging Diagrams and Parameters

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 | | |
| Pitch | | e | | |
| Top to Seating Plane | | A | | |
| Molded Package Thickness | | A2 | | |
| Base to Seating Plane | | A1 | | |
| Shoulder to Shoulder Width | | E | | |
| Molded Package Width | | E1 | | |
| Overall Length | | D | | |
| Tip to Seating Plane | | L | | |
| Lead Thickness | | c | | |
| Upper Lead Width | | b1 | | |
| Lower Lead Width | | b | | |
| Overall Row Spacing § | | eB | | |

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.

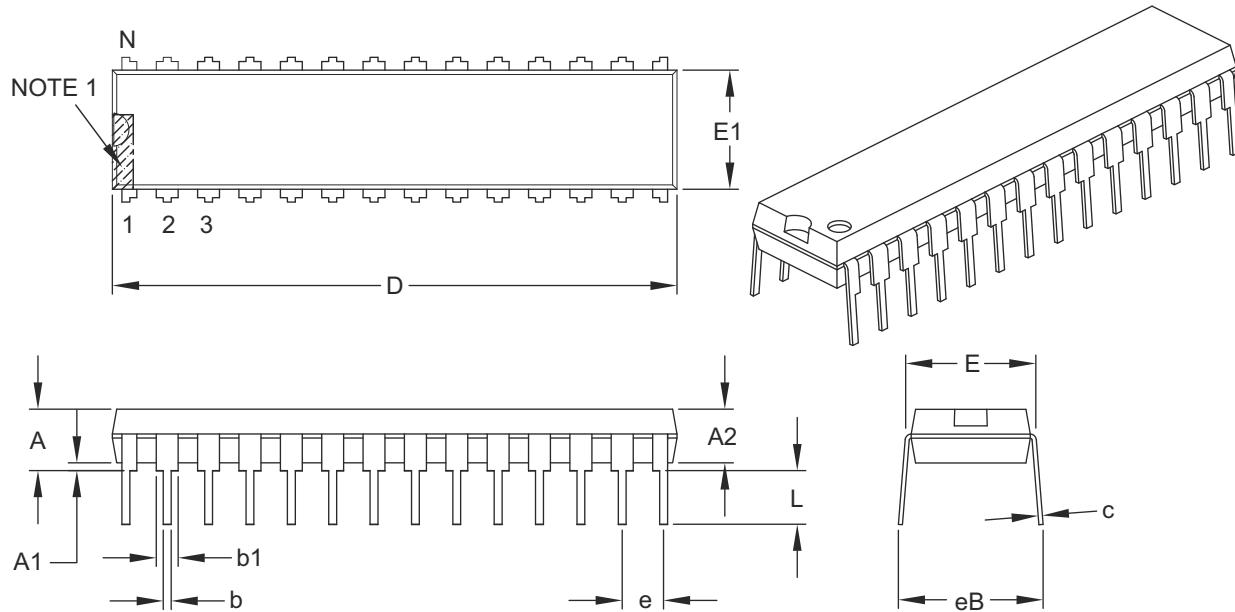
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing C04-070B

Packaging Diagrams and Parameters

28-Lead Skinny Plastic Dual In-Line (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 | | 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

NOTES:

Packaging Diagrams and Parameters

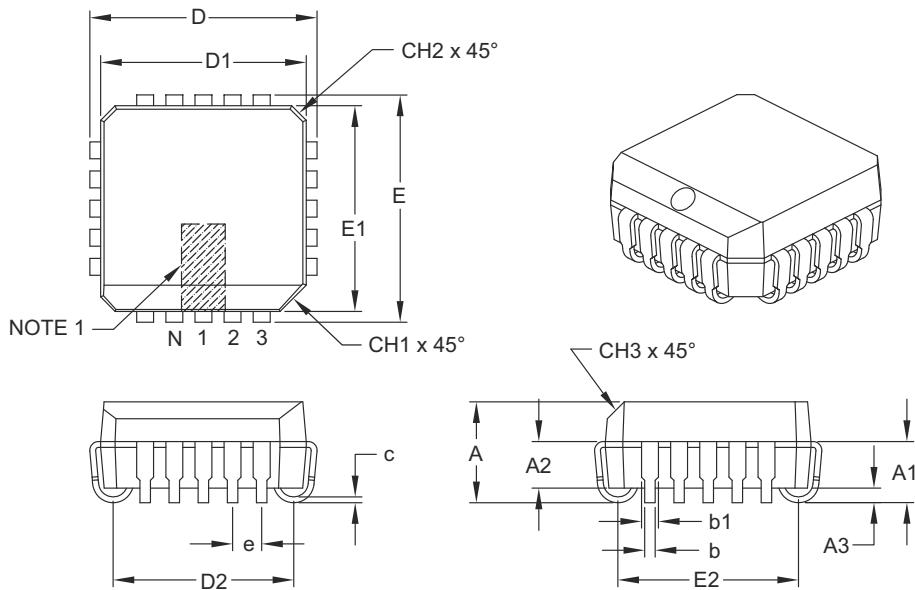
PLCC Family

Plastic Leaded Chip Carrier Packages

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 | |

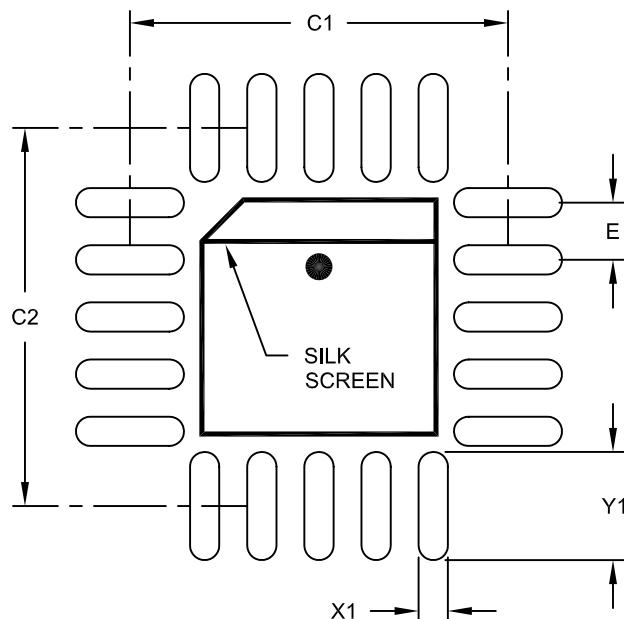
Notes:

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.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| | | Units | INCHES | | |
|--------------------------|----|-------|--------|------|------|
| Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | E | | .050 | BSC | |
| Contact Pad Spacing | C1 | | | .331 | |
| Contact Pad Spacing | C2 | | | .331 | |
| Contact Pad Width (X20) | X1 | | | | .026 |
| Contact Pad Length (X20) | Y1 | | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

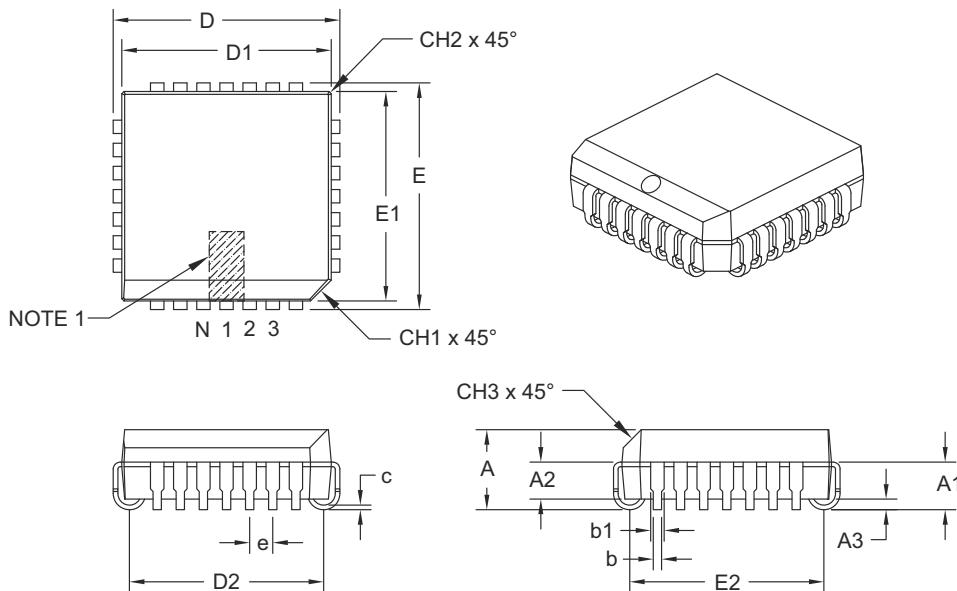
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2064A

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 |

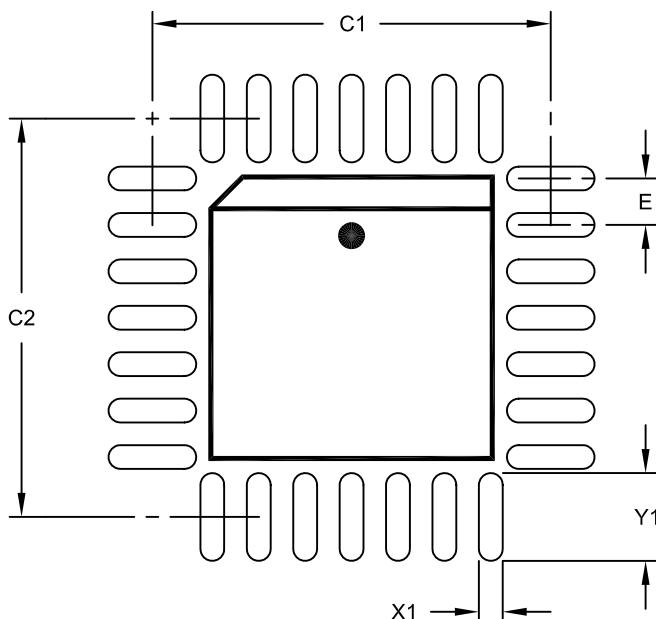
Notes:

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.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | INCHES | | |
|--------------------------|----|--------|------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | .050 | BSC | |
| Contact Pad Spacing | C1 | | .429 | |
| Contact Pad Spacing | C2 | | .429 | |
| Contact Pad Width (X28) | X1 | | | .026 |
| Contact Pad Length (X28) | Y1 | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

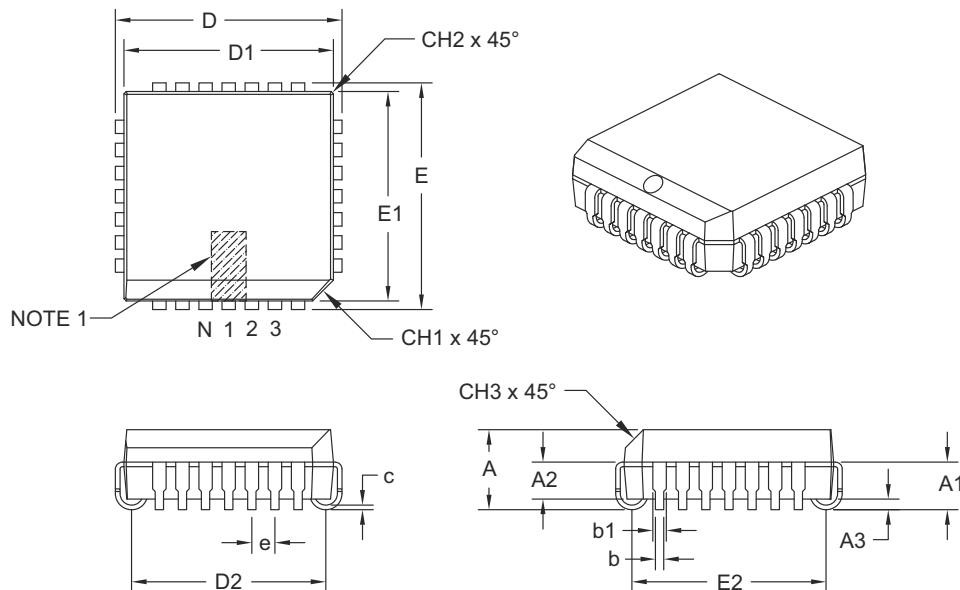
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2026A

Packaging Diagrams and Parameters

28-Lead Plastic Leaded Chip Carrier (LI) – 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 | | |
|---------------------------|-----|--------|------|-------|
| | N | 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 |

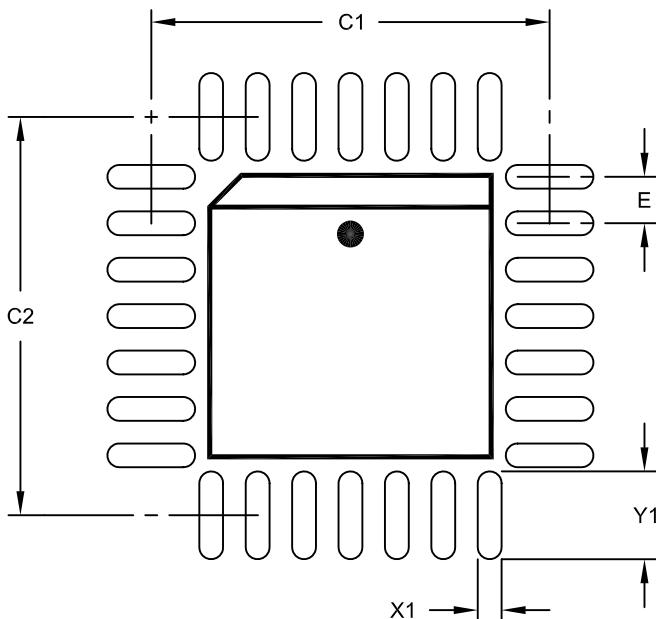
Notes:

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.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| | | Units | | | INCHES | | |
|--------------------------|----|------------------|--|--|--------|------|------|
| | | Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | E | | | | .050 | BSC | |
| Contact Pad Spacing | C1 | | | | .429 | | |
| Contact Pad Spacing | C2 | | | | .429 | | |
| Contact Pad Width (X28) | X1 | | | | | .026 | |
| Contact Pad Length (X28) | Y1 | | | | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

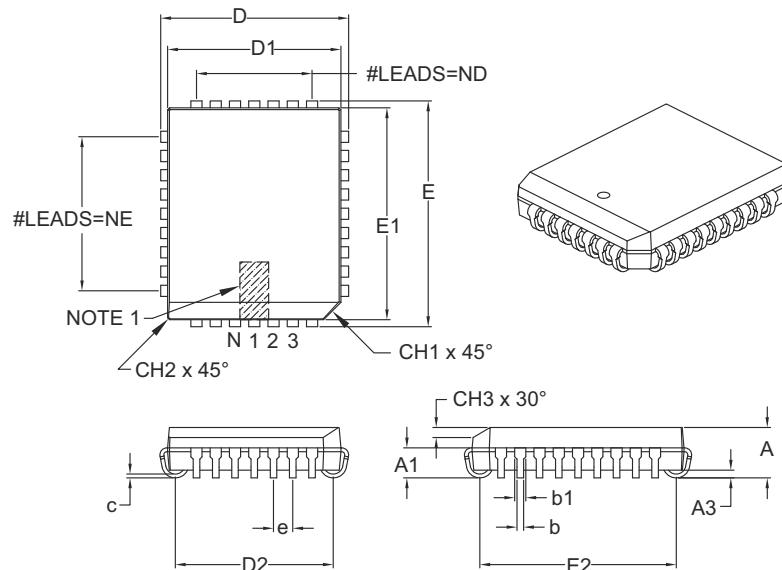
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2026A

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>



| Dimension Limits | | INCHES | | |
|-----------------------|-----|--------|------|------|
| | | 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 |

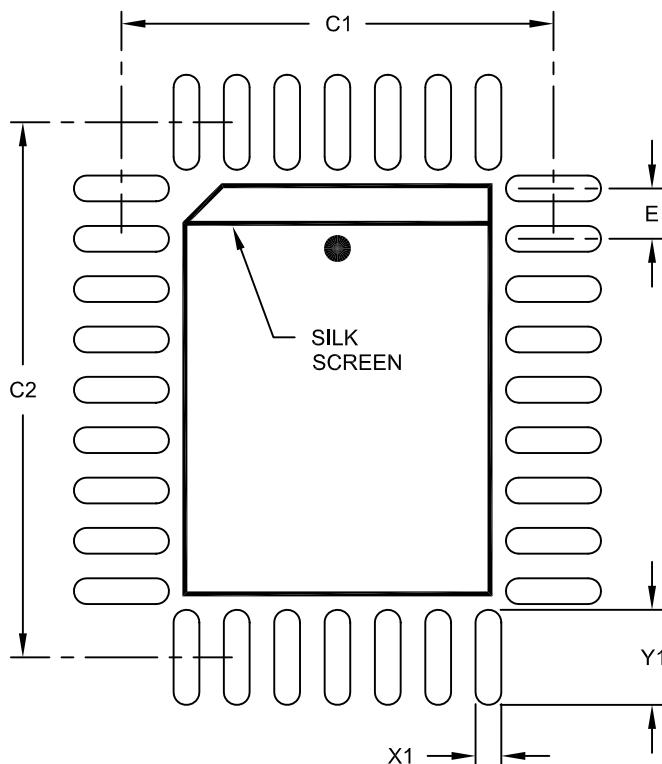
Notes:

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.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | INCHES | | |
|--------------------------|----|--------|----------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | | .050 BSC | |
| Contact Pad Spacing | C1 | | .429 | |
| Contact Pad Spacing | C2 | | .531 | |
| Contact Pad Width (X32) | X1 | | | ,026 |
| Contact Pad Length (X32) | Y1 | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

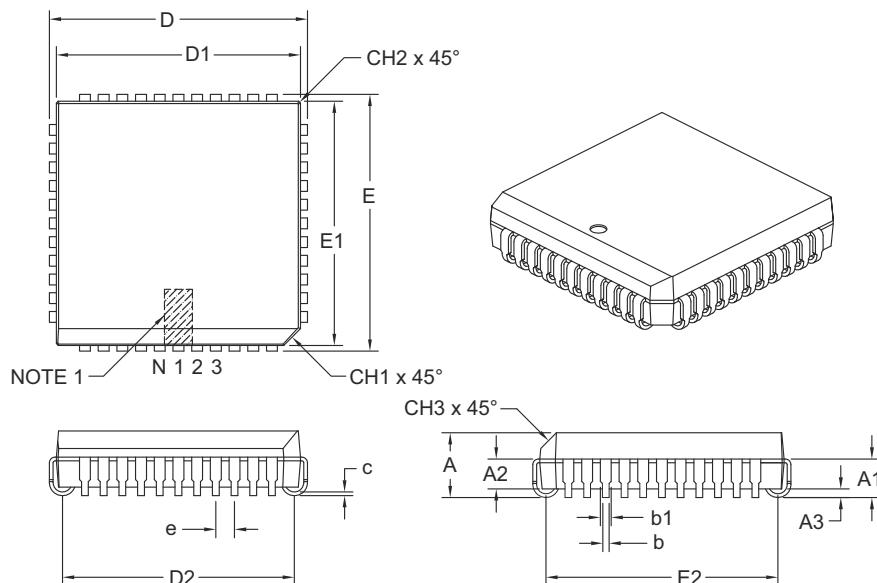
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2023A

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 | | 44 | | |
| Pitch | | .050 | | |
| Overall Height | | A | .165 | .172 |
| Contact Height | | A1 | .090 | .105 |
| Molded Package to Contact | | A2 | .062 | – |
| Standoff § | | A3 | .020 | – |
| Corner Chamfer | | CH1 | .042 | – |
| Chamfers | | CH2 | – | – |
| Side Chamfer | | CH3 | .042 | – |
| Overall Width | | E | .685 | .690 |
| Overall Length | | D | .685 | .690 |
| Molded Package Width | | E1 | .650 | .653 |
| Molded Package Length | | D1 | .650 | .653 |
| Footprint Width | | E2 | .582 | .610 |
| Footprint Length | | D2 | .582 | .610 |
| Lead Thickness | | c | .0075 | – |
| Upper Lead Width | | b1 | .026 | – |
| Lower Lead Width | | b | .013 | – |
| | | | | .021 |

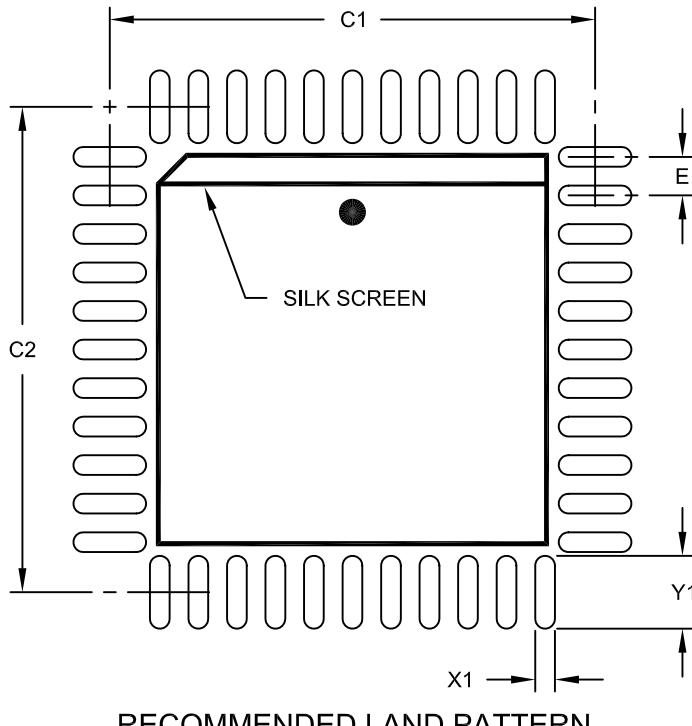
Notes:

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.

Land Pattern (Footprint)

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>



| Dimension | Units | INCHES | | |
|--------------------------|-------|--------|----------|------|
| | | MIN | NOM | MAX |
| Contact Pitch | E | | .050 BSC | |
| Contact Pad Spacing | C1 | | .630 | |
| Contact Pad Spacing | C2 | | .630 | |
| Contact Pad Width (X44) | X1 | | | .026 |
| Contact Pad Length (X44) | Y1 | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

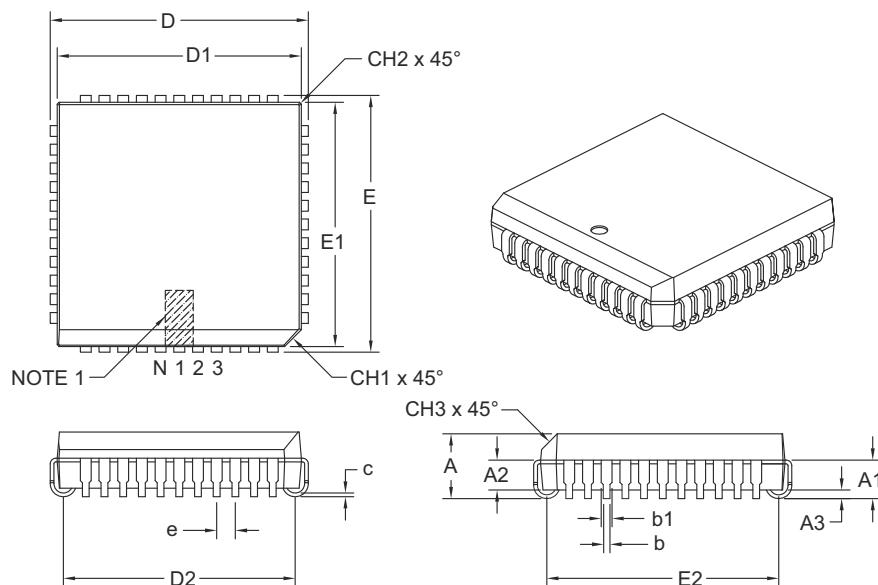
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2048A

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 |

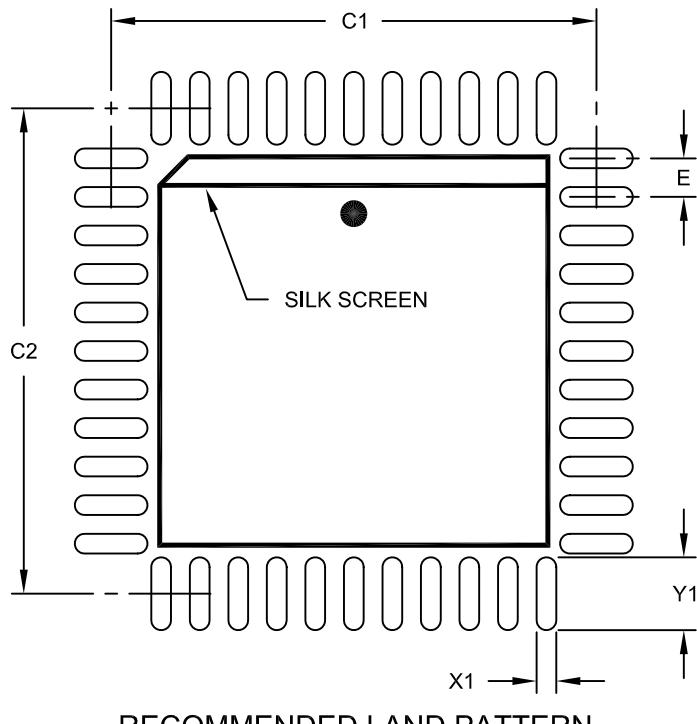
Notes:

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.

Land Pattern (Footprint)

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>



| Dimension | Units | INCHES | | |
|--------------------------|-------|--------|----------|------|
| | | MIN | NOM | MAX |
| Contact Pitch | E | | .050 BSC | |
| Contact Pad Spacing | C1 | | .630 | |
| Contact Pad Spacing | C2 | | .630 | |
| Contact Pad Width (X44) | X1 | | | .026 |
| Contact Pad Length (X44) | Y1 | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

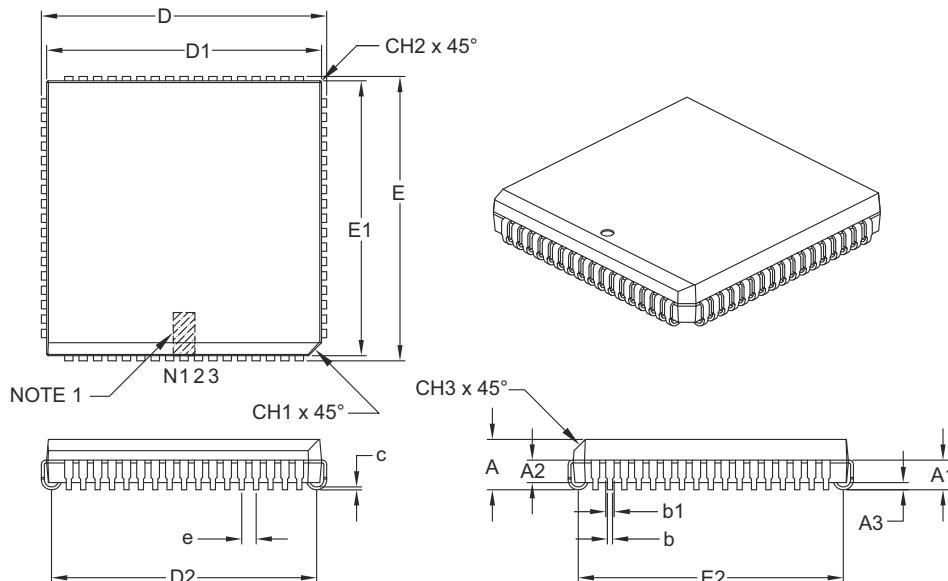
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2048A

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>



| 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 |

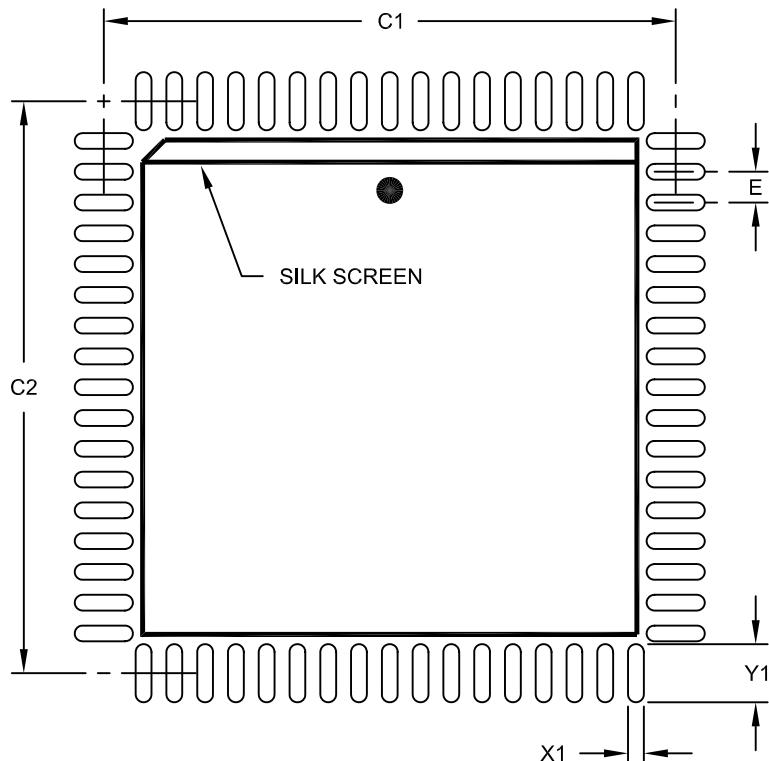
Notes:

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.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Dimension | Limits | INCHES | | |
|--------------------------|--------|--------|------|------|
| | | MIN | NOM | MAX |
| Contact Pitch | E | .050 | BSC | |
| Contact Pad Spacing | C1 | | .929 | |
| Contact Pad Spacing | C2 | | .929 | |
| Contact Pad Width (X68) | X1 | | | .026 |
| Contact Pad Length (X68) | Y1 | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

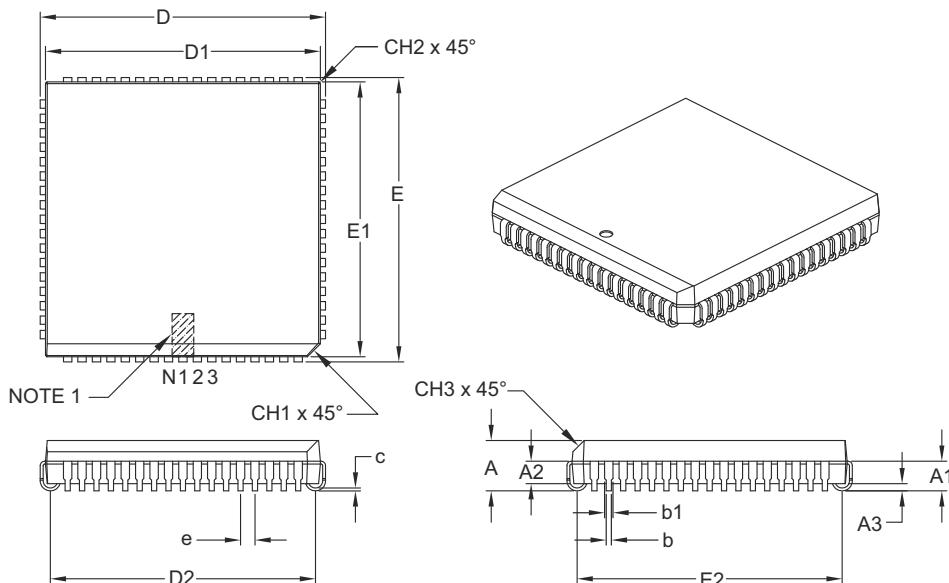
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2049A

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 | |

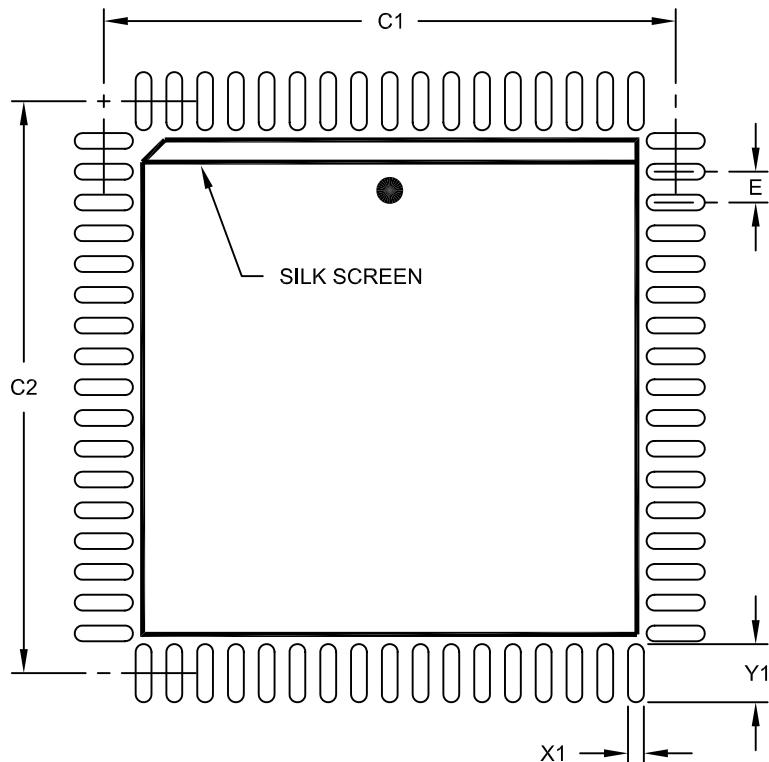
Notes:

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.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Dimension | Limits | Units INCHES | | |
|--------------------------|--------|--------------|----------|------|
| | | MIN | NOM | MAX |
| Contact Pitch | E | | .050 BSC | |
| Contact Pad Spacing | C1 | | .929 | |
| Contact Pad Spacing | C2 | | .929 | |
| Contact Pad Width (X68) | X1 | | | .026 |
| Contact Pad Length (X68) | Y1 | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

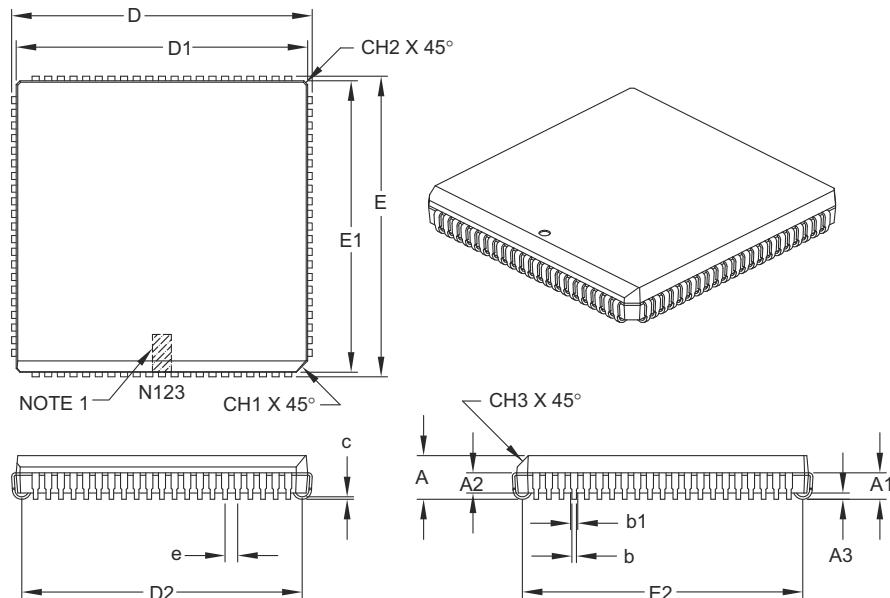
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2049A

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 |

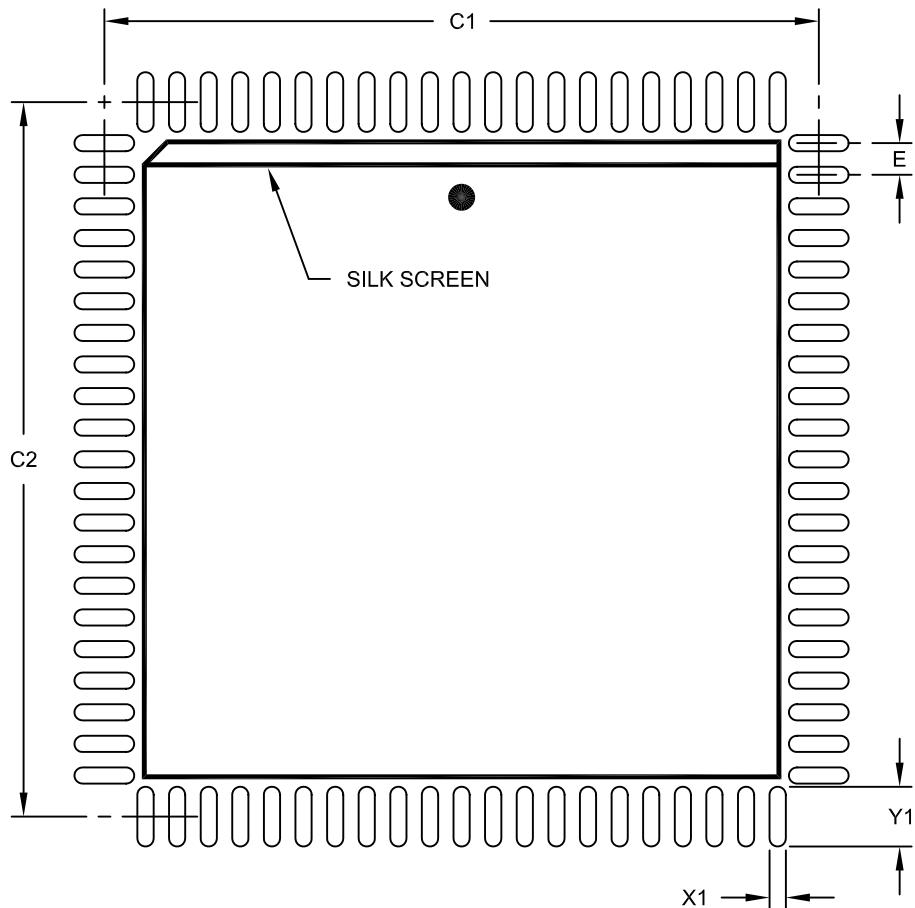
Notes:

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.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | INCHES | | |
|--------------------------|--------|--------|----------|------|
| Dimension | Limits | MIN | NOM | MAX |
| Contact Pitch | E | | .050 BSC | |
| Contact Pad Spacing | C1 | | 1.130 | |
| Contact Pad Spacing | C2 | | 1.130 | |
| Contact Pad Width (X84) | X1 | | | .026 |
| Contact Pad Length (X84) | Y1 | | | .094 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2093A

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

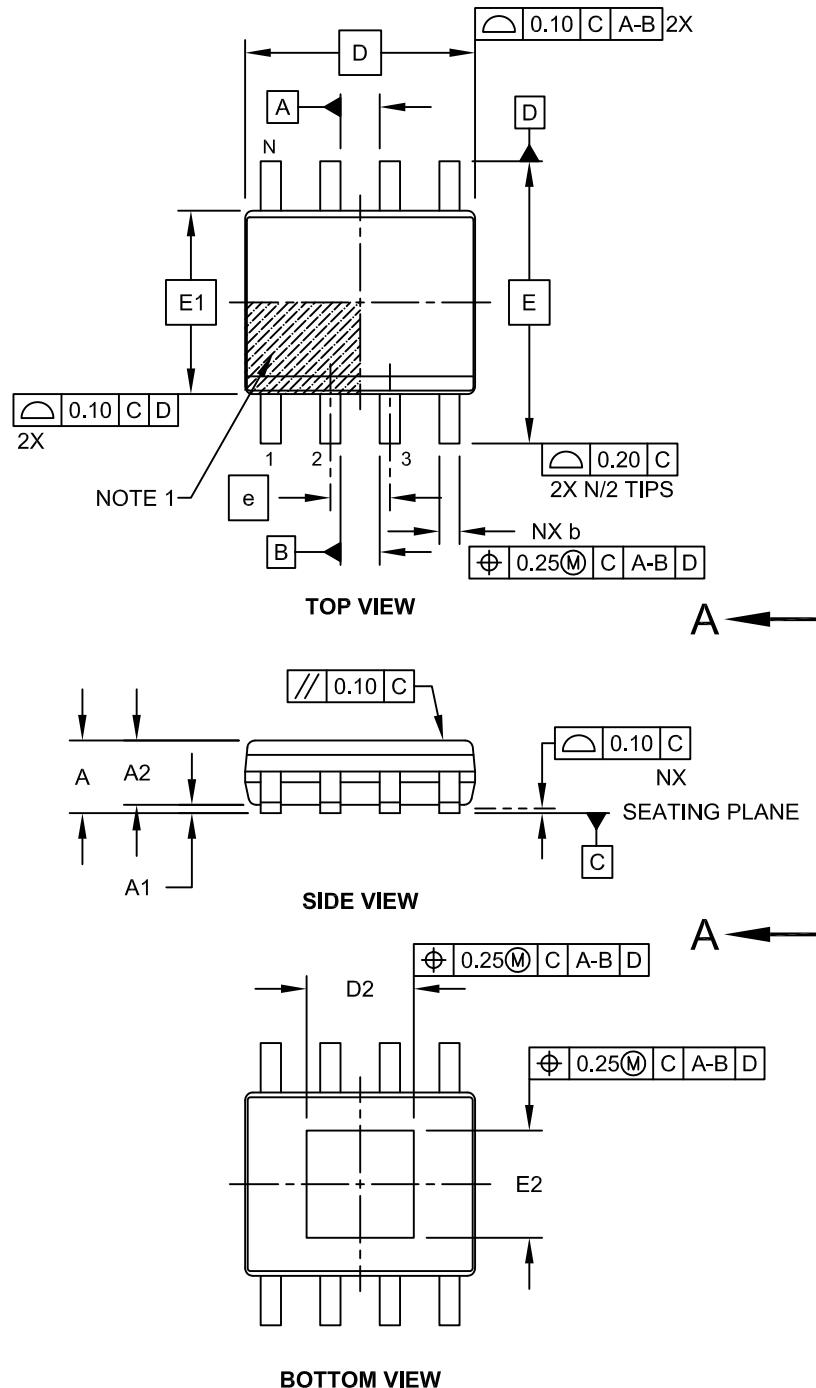
SOP Family

Small Outline Packages

Packaging Diagrams and Parameters

8-Lead Thermally Enhanced Plastic Small Outline (SE) - Narrow, 3.90 mm Body [SOP]

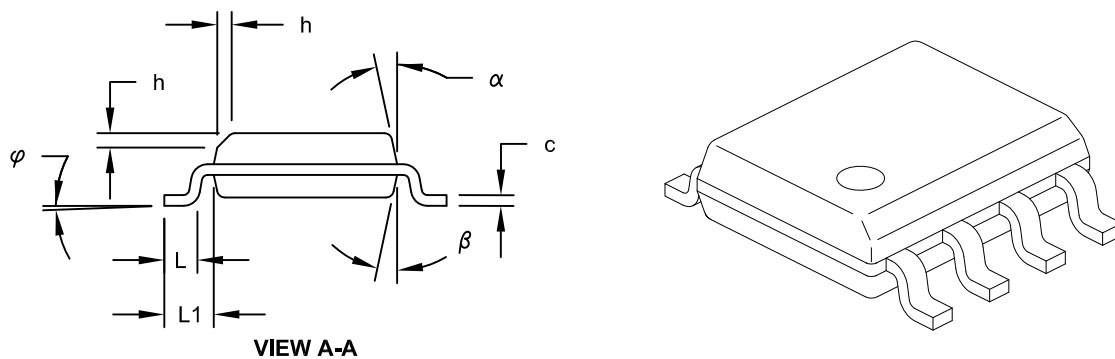
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

8-Lead Thermally Enhanced Plastic Small Outline (SE) - Narrow, 3.90 mm Body [SOP]

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 | |
| Overall Height | A | - | - | 1.75 |
| Molded Package Thickness | A2 | 1.25 | - | - |
| Standoff § | A1 | 0.00 | - | 0.15 |
| Overall Width | E | 5.80 | 6.00 | 6.20 |
| Molded Package Width | E1 | 3.80 | 3.90 | 4.00 |
| Overall Length | D | 4.70 | 4.90 | 5.10 |
| Exposed Pad Width | E2 | 2.19 | 2.29 | 2.39 |
| Exposed Pad Length | D2 | 2.19 | 2.29 | 2.39 |
| Chamfer (Optional) | h | 0.25 | - | 0.50 |
| Foot Length | L | 0.40 | - | 1.27 |
| Footprint | L1 | 1.04 | 1.04 | 1.04 |
| 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:

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

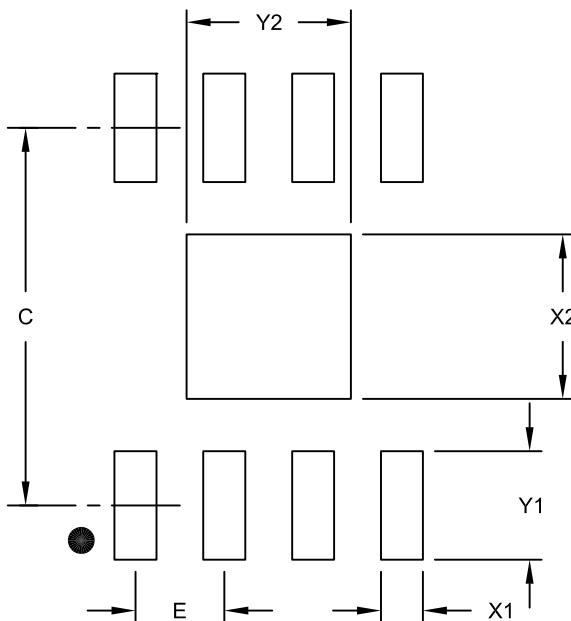
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

8-Lead Thermally Enhanced Plastic Small Outline (SE) - Narrow, 3.90 mm Body [SOP]

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 | |
| Exposed Pad Width | X2 | | 2.35 | |
| Exposed Pad Length | Y2 | | 2.35 | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2121A

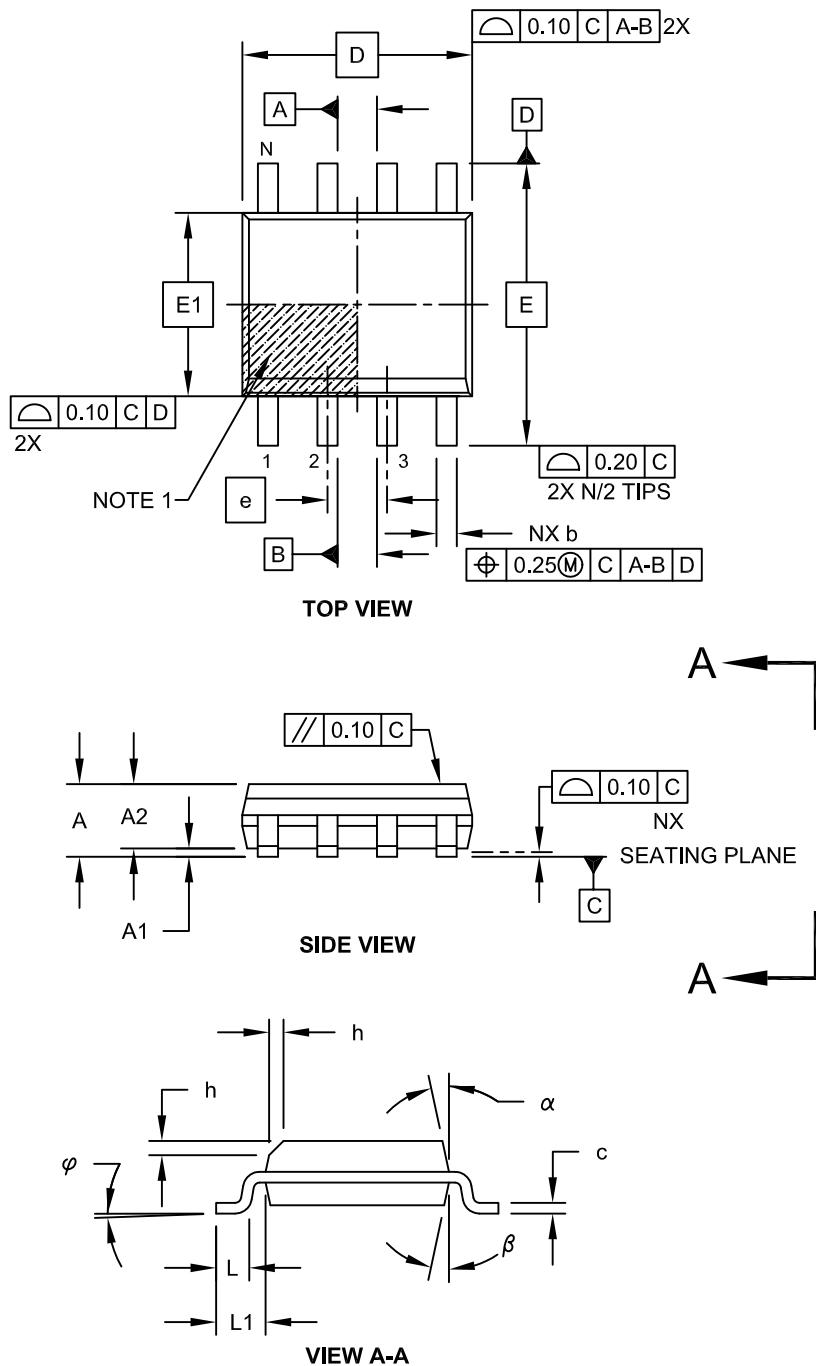
Packaging Diagrams and Parameters

SOIC Family
Small Outline Plastic Packages

Packaging Diagrams and Parameters

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

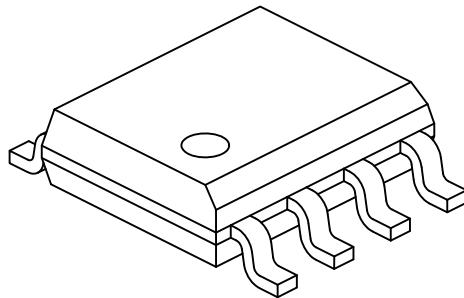
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 | 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 0.15mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M

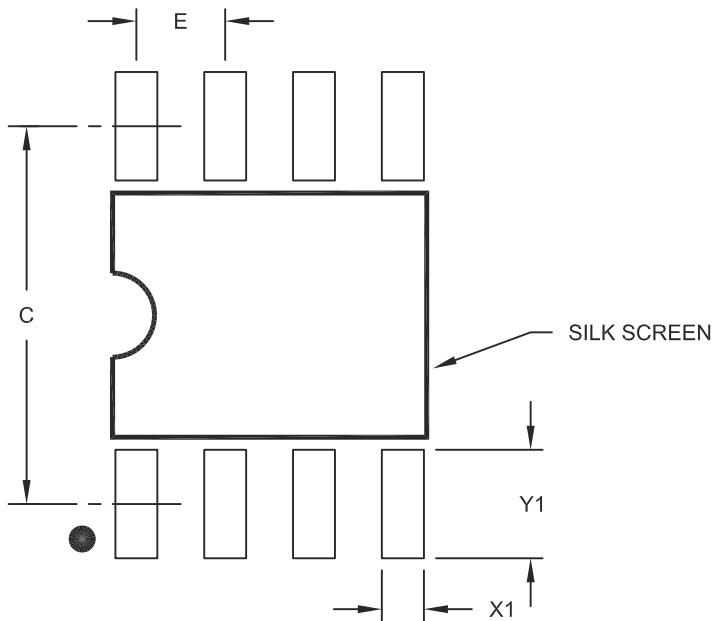
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

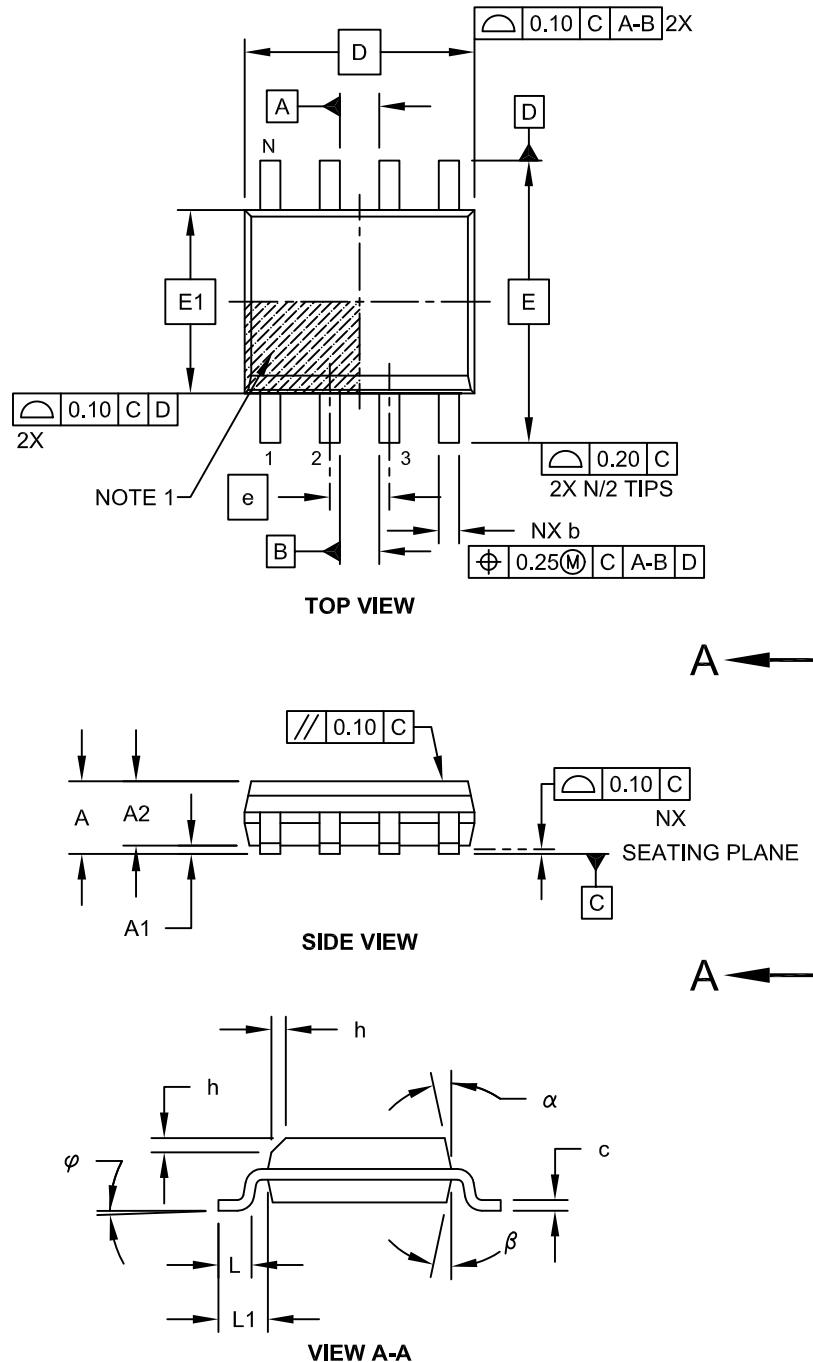
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

Packaging Diagrams and Parameters

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

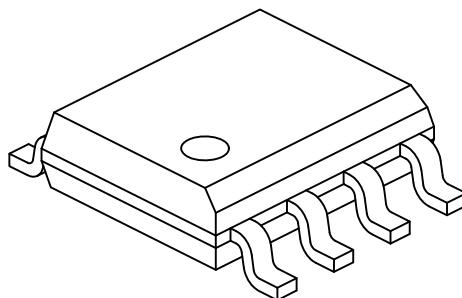
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 | 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 0.15mm per side.
4. Dimensioning and tolerancing per ASME Y14.5M

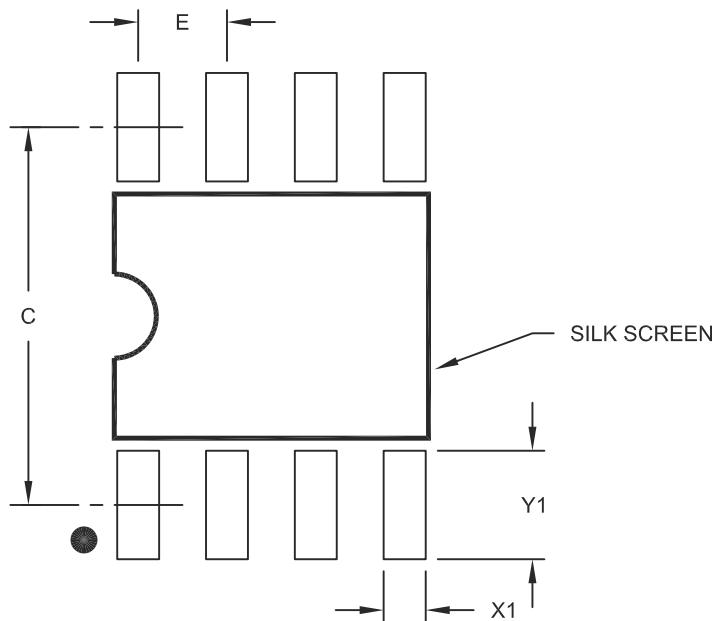
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

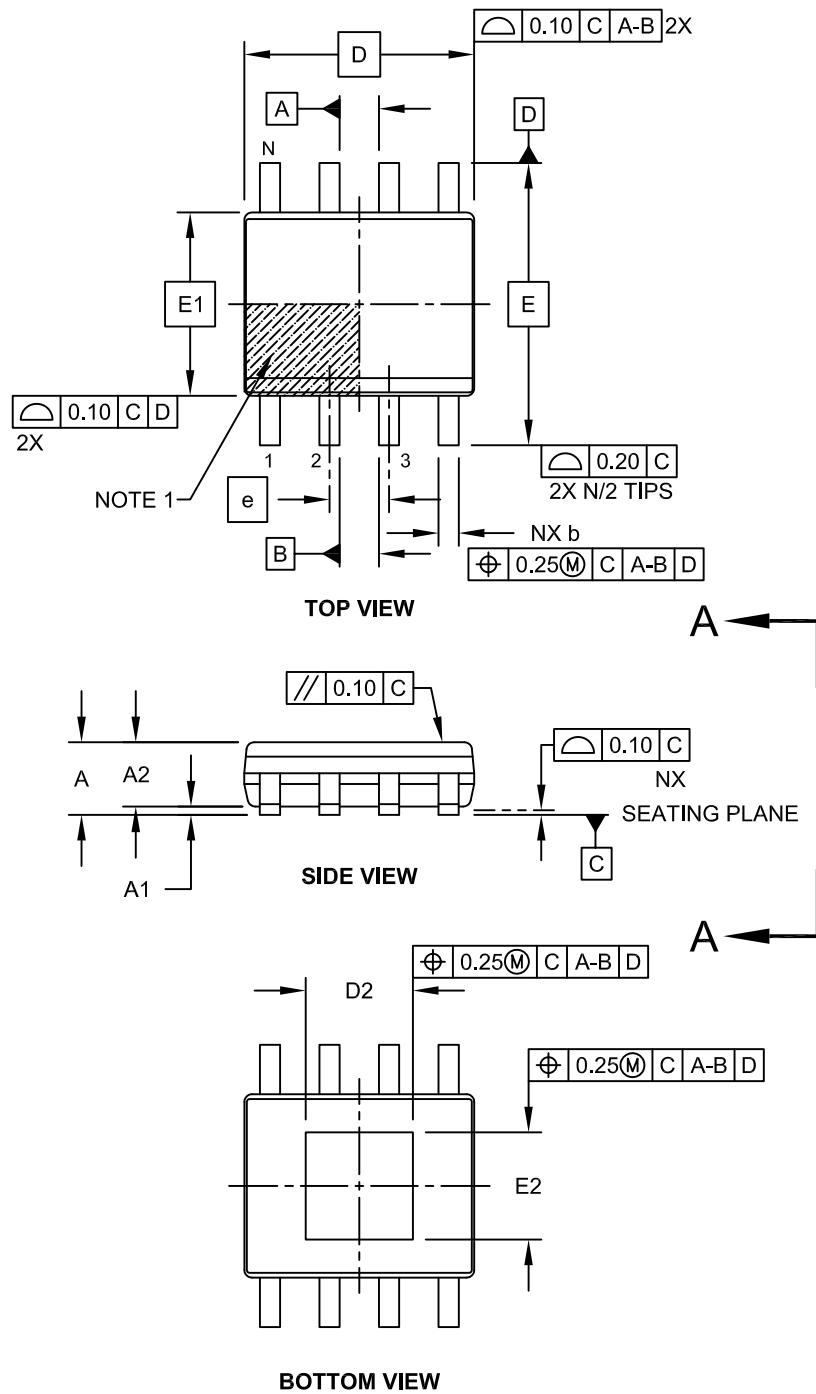
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2057A

Packaging Diagrams and Parameters

8-Lead Thermally Enhanced Plastic Small Outline (SE) - 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>

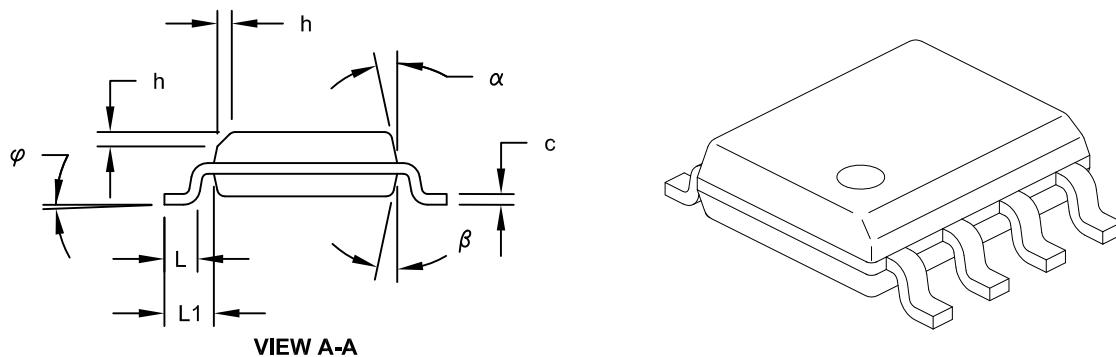


Microchip Technology Drawing No. C04-162B Sheet 1 of 2

Packaging Diagrams and Parameters

8-Lead Thermally Enhanced Plastic Small Outline (SE) - 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>



| Dimension | Limits | Units | | |
|--------------------------|--------|-------------|------|------|
| | | MILLIMETERS | | |
| Number of Pins | N | | MIN | NOM |
| Pitch | e | | 1.27 | BSC |
| Overall Height | A | - | - | 1.75 |
| Molded Package Thickness | A2 | 1.25 | - | - |
| Standoff § | A1 | 0.10 | - | 0.15 |
| Overall Width | E | 6.00 | BSC | |
| Molded Package Width | E1 | 3.90 | BSC | |
| Overall Length | D | 4.90 | BSC | |
| Exposed Pad Width | E2 | 2.19 | 2.29 | 2.39 |
| Exposed Pad Length | D2 | 2.19 | 2.29 | 2.39 |
| 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 0.15mm per side.

4. Dimensioning and tolerancing per ASME Y14.5M

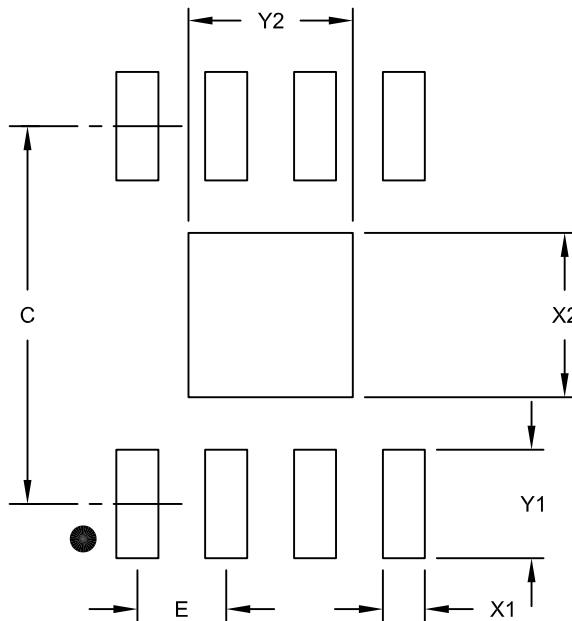
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

8-Lead Thermally Enhanced Plastic Small Outline (SE) - 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 |
| Exposed Pad Width | X2 | | | 2.35 |
| Exposed Pad Length | Y2 | | | 2.35 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

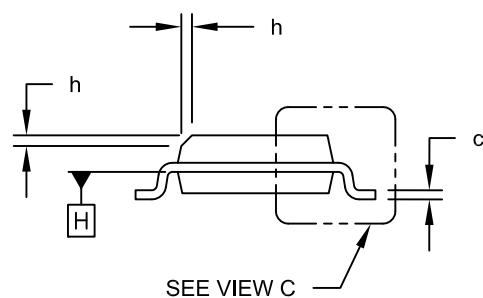
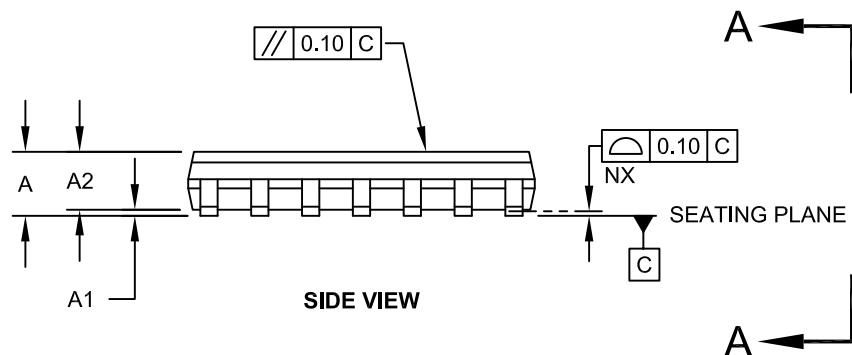
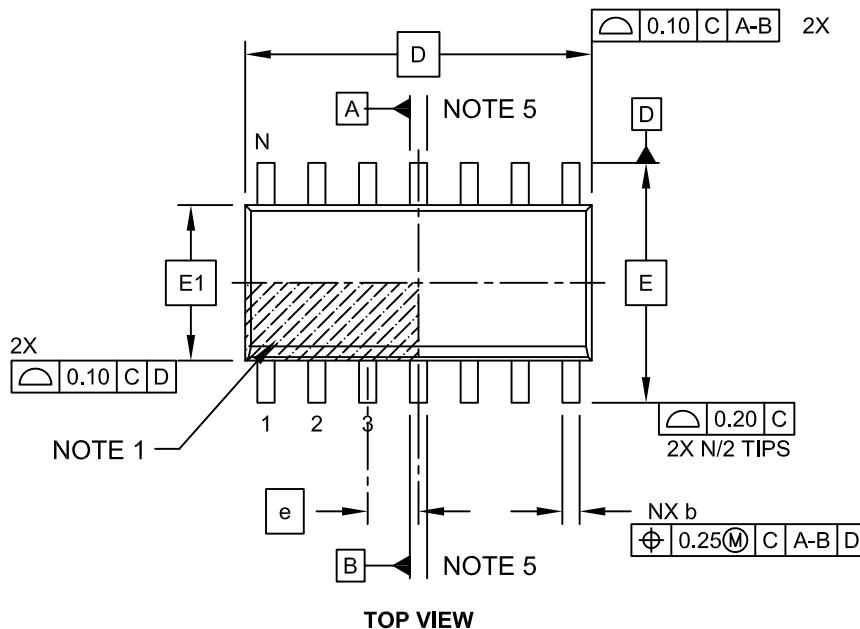
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2162A

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>

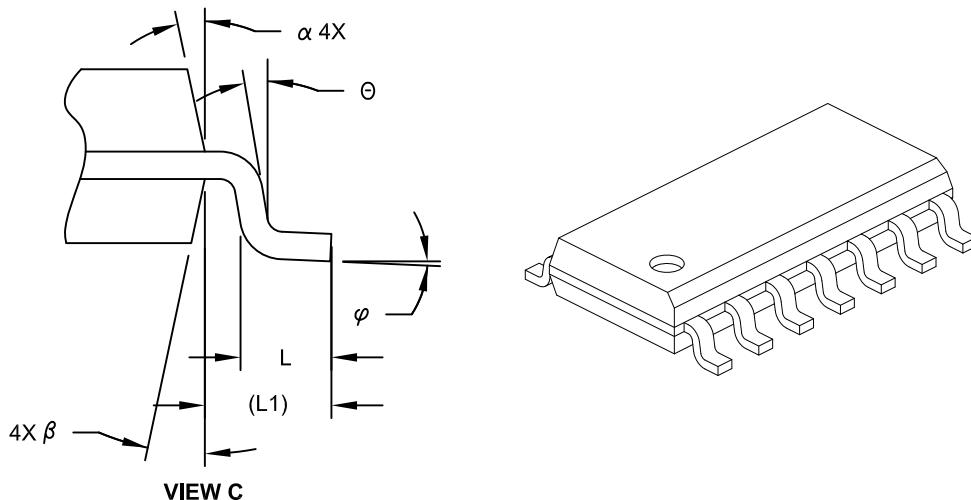


Microchip Technology Drawing No. C04-065C Sheet 1 of 2

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 | | |
| Lead Angle | Θ | 0° | | - | - |
| Foot Angle | φ | 0° | | - | 8° |
| Lead Thickness | c | 0.10 | | - | 0.25 |
| Lead Width | b | 0.31 | | - | 0.51 |
| Mold Draft Angle Top | α | 5° | | - | 15° |
| Mold Draft Angle Bottom | β | 5° | | - | 15° |

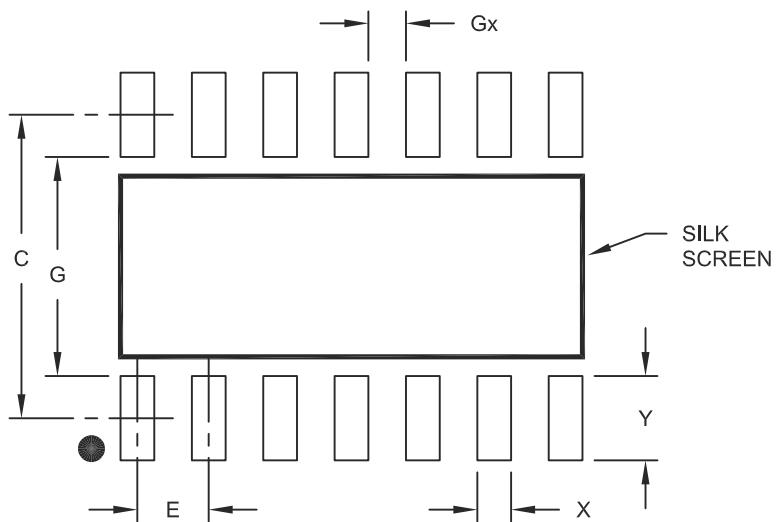
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
 2. § Significant Characteristic
 3. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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. Datums A & B to be determined at Datum H.

Land Pattern (Footprint)

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>



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

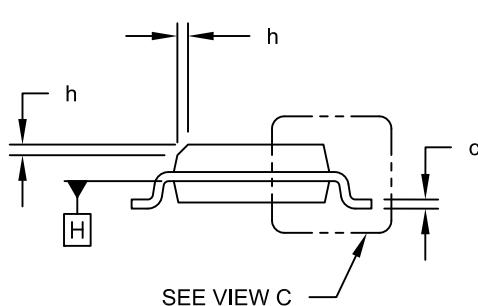
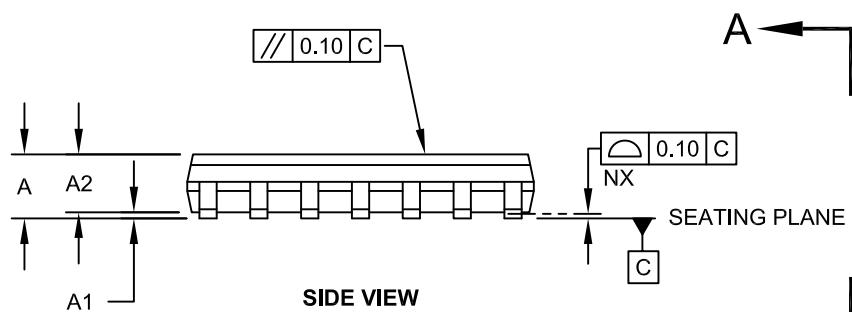
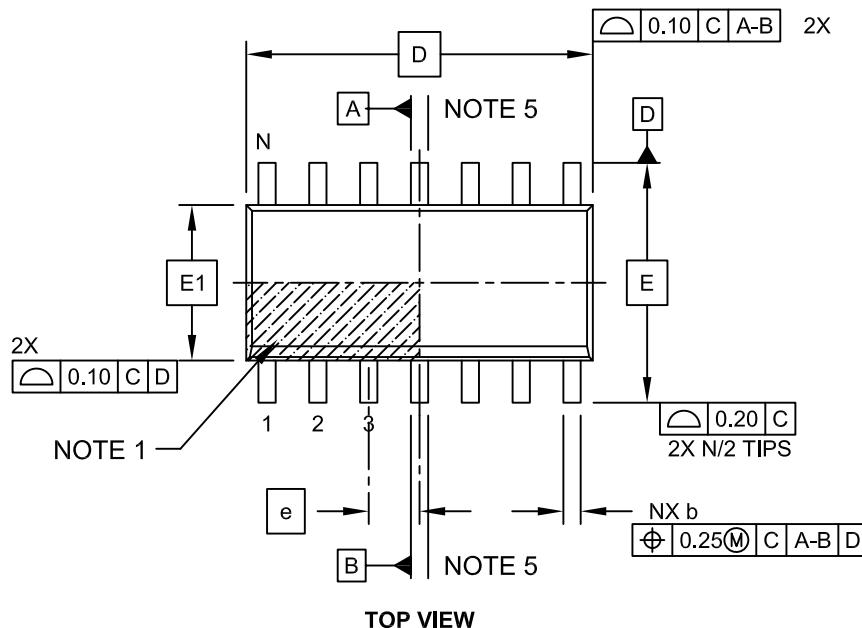
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2065A

Packaging Diagrams and Parameters

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>



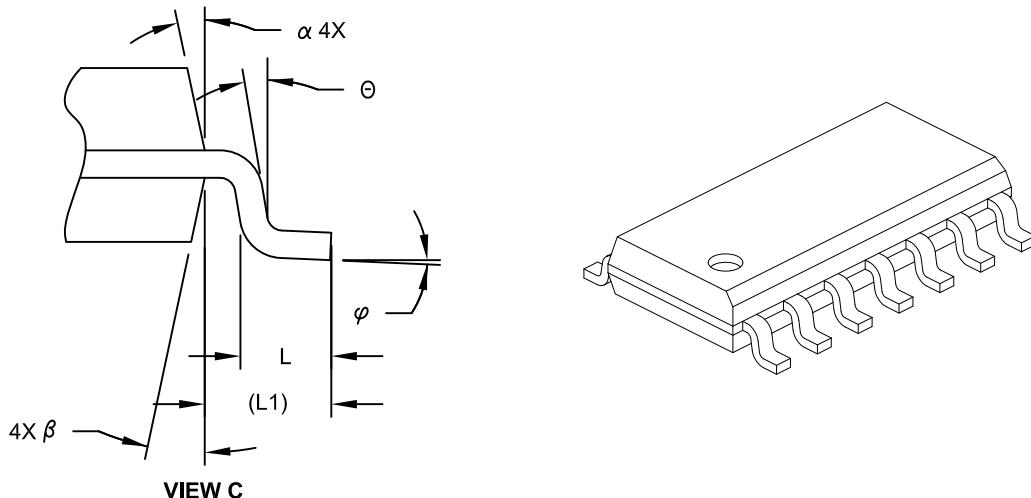
VIEW A-A

Microchip Technology Drawing No. C04-065C Sheet 1 of 2

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 | |
| Lead Angle | θ | | 0° | - | - |
| Foot Angle | φ | | 0° | - | 8° |
| Lead Thickness | c | | 0.10 | - | 0.25 |
| Lead Width | b | | 0.31 | - | 0.51 |
| Mold Draft Angle Top | α | | 5° | - | 15° |
| Mold Draft Angle Bottom | β | | 5° | - | 15° |

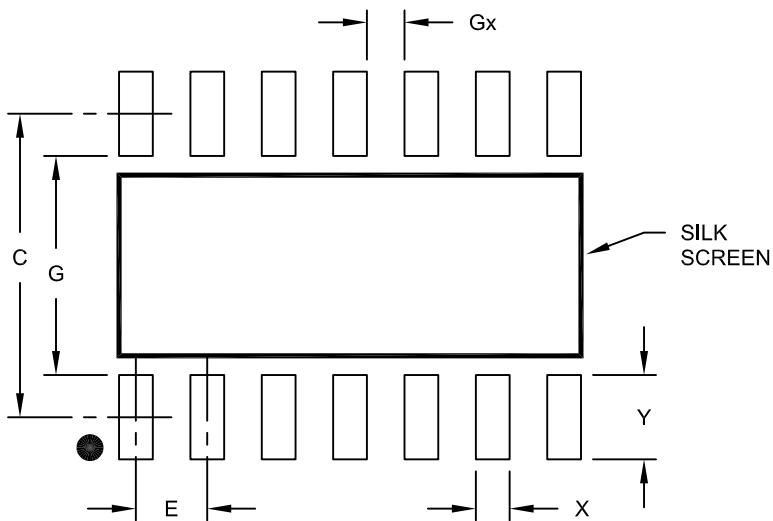
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
 2. § Significant Characteristic
 3. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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. Datums A & B to be determined at Datum H.

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

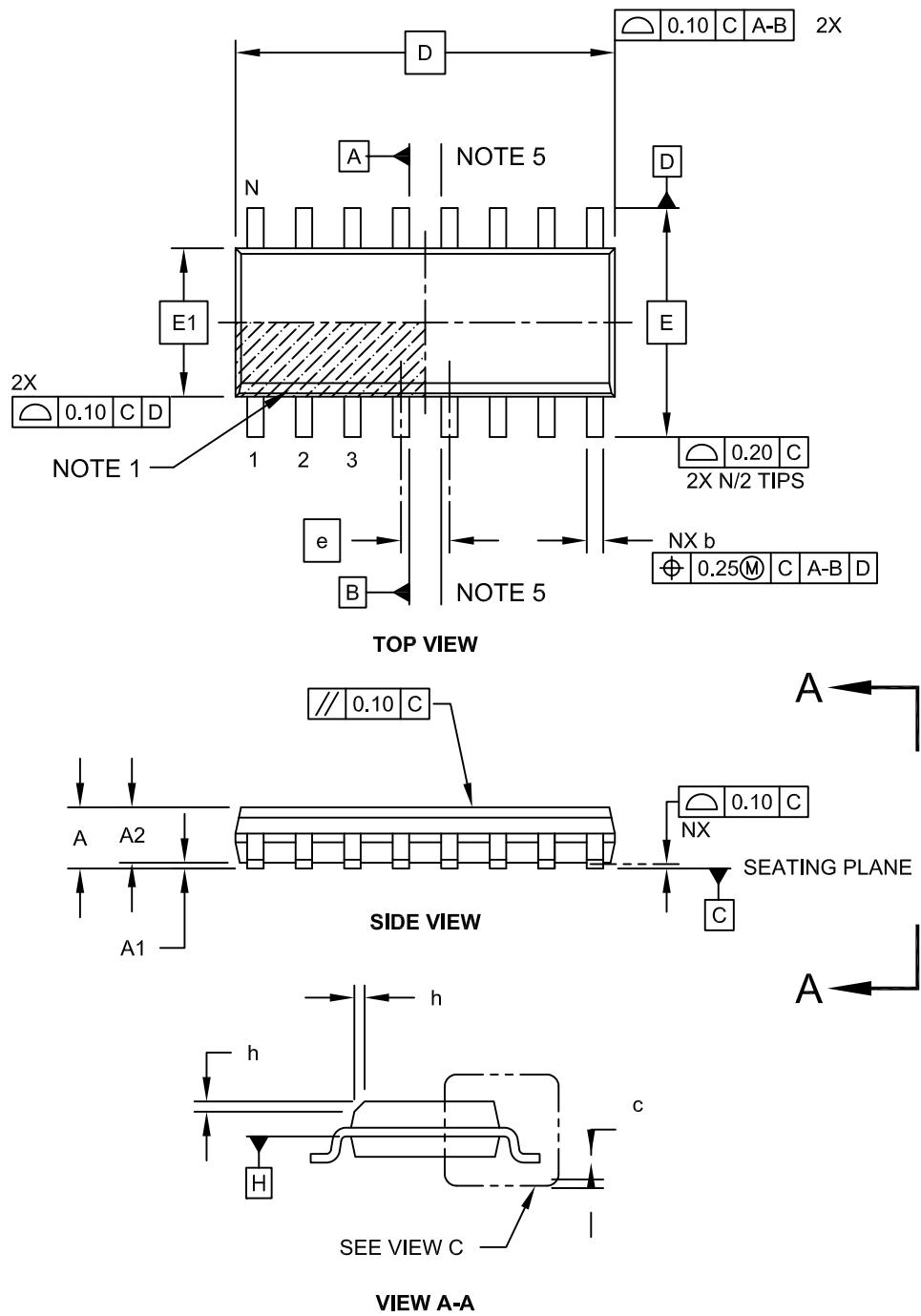
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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>



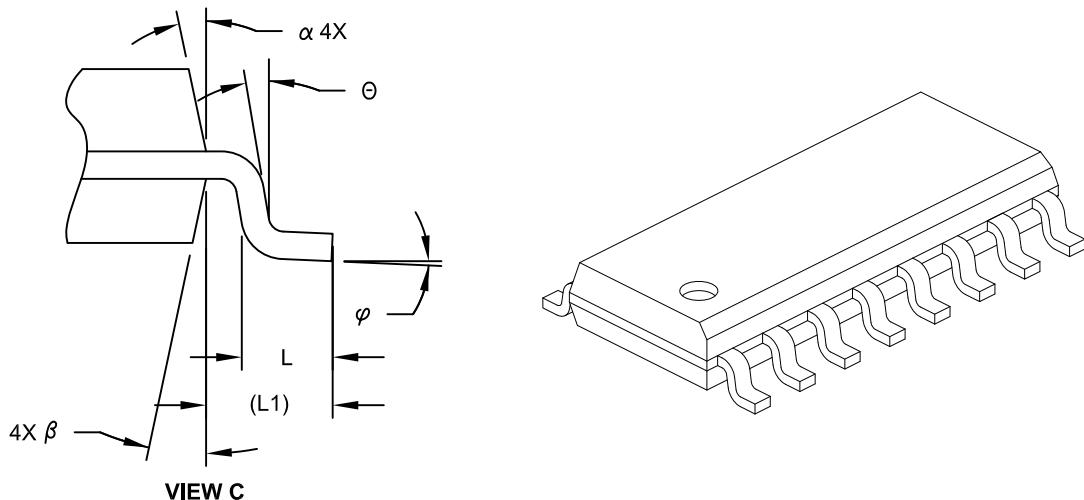
VIEW A-A

Microchip Technology Drawing No. C04-108C Sheet 1 of 2

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 | | |
| Lead Angle | θ | 0° | - | - |
| Foot Angle | φ | 0° | - | 8° |
| Lead Thickness | c | 0.10 | - | 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. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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.

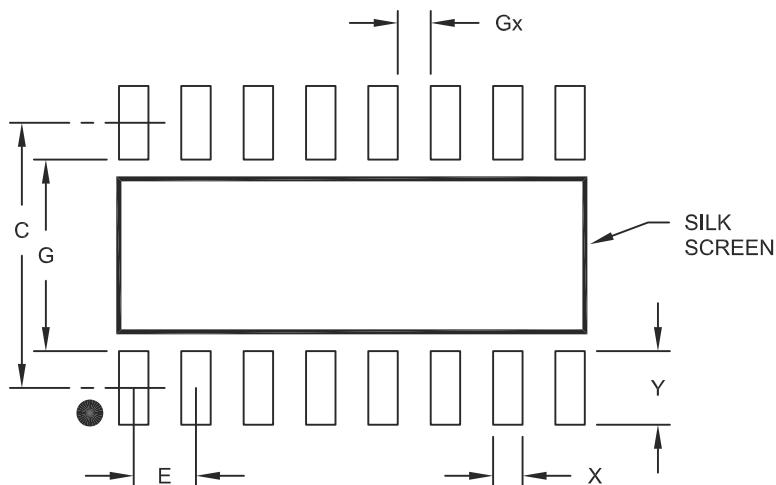
5. Datums A & B to be determined at Datum H.

Microchip Technology Drawing No. C04-108C Sheet 2 of 2

Land Pattern (Footprint)

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>



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

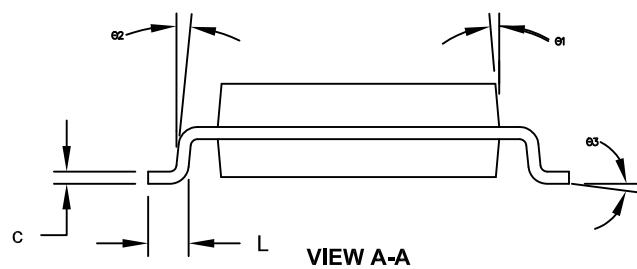
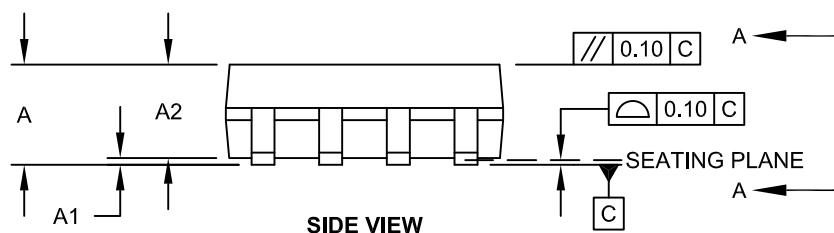
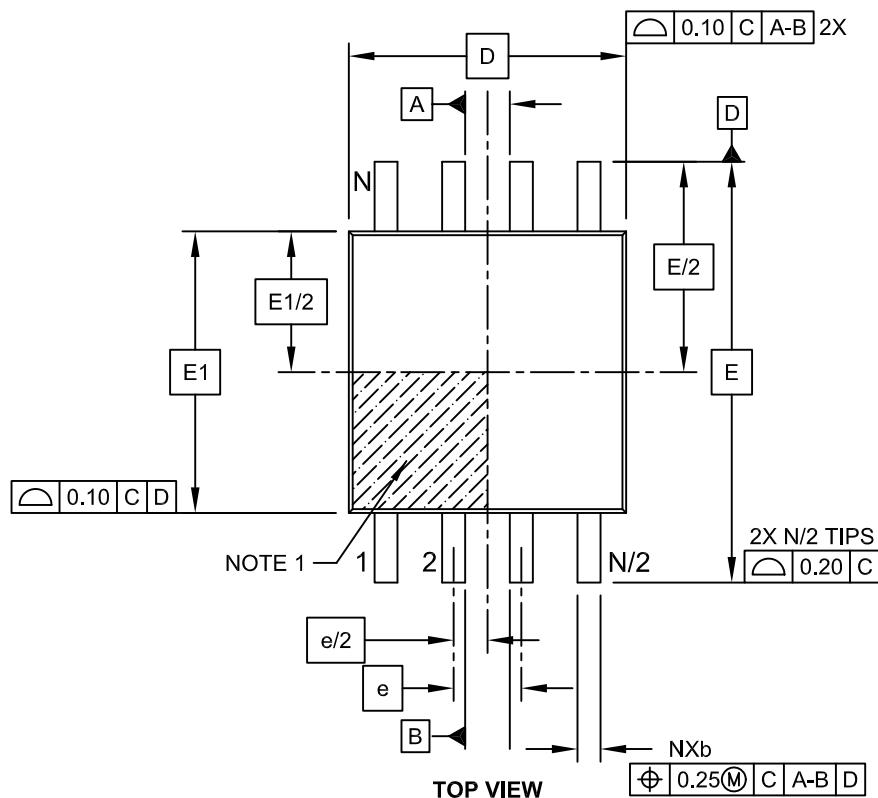
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2108A

Packaging Diagrams and Parameters

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

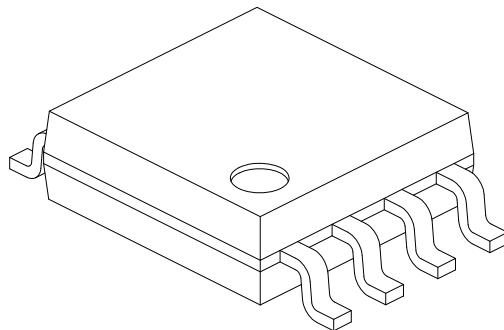
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 | |
| Standoff § | A1 | 0.05 | | 0.25 | |
| Molded Package Thickness | A2 | 1.75 | - | 1.98 | |
| Overall Width | E | | 7.94 | BSC | |
| Molded Package Width | E1 | | 5.25 | BSC | |
| Overall Length | D | | 5.26 | BSC | |
| Foot Length | L | 0.51 | - | 0.76 | |
| Lead Thickness | c | 0.15 | - | 0.25 | |
| Lead Width | b | 0.36 | - | 0.51 | |
| Mold Draft Angle | Θ1 | - | - | 15° | |
| Lead Angle | Θ2 | 0° | - | 8° | |
| Foot Angle | Θ3 | 0° | - | 8° | |

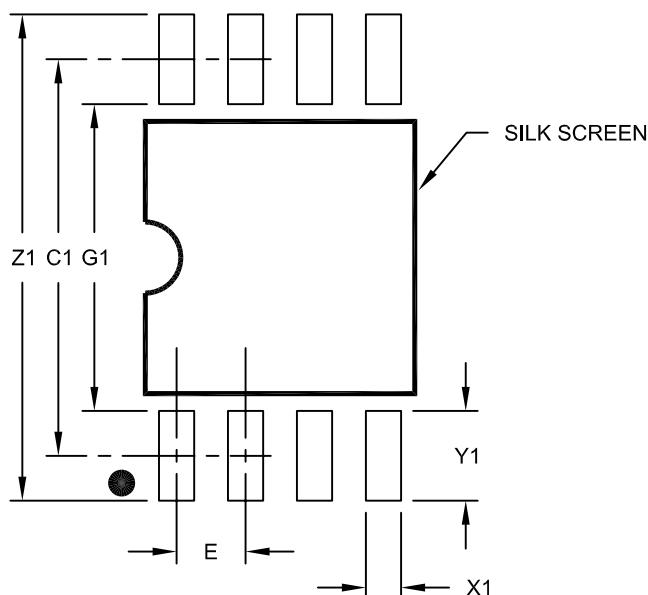
Notes:

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 0.25mm per side.

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>



| 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 (X8) | X1 | | | 0.65 |
| Contact Pad Length (X8) | Y1 | | | 1.70 |
| Distance Between Pads | G1 | 5.60 | | |
| Distance Between Pads | G | 0.62 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

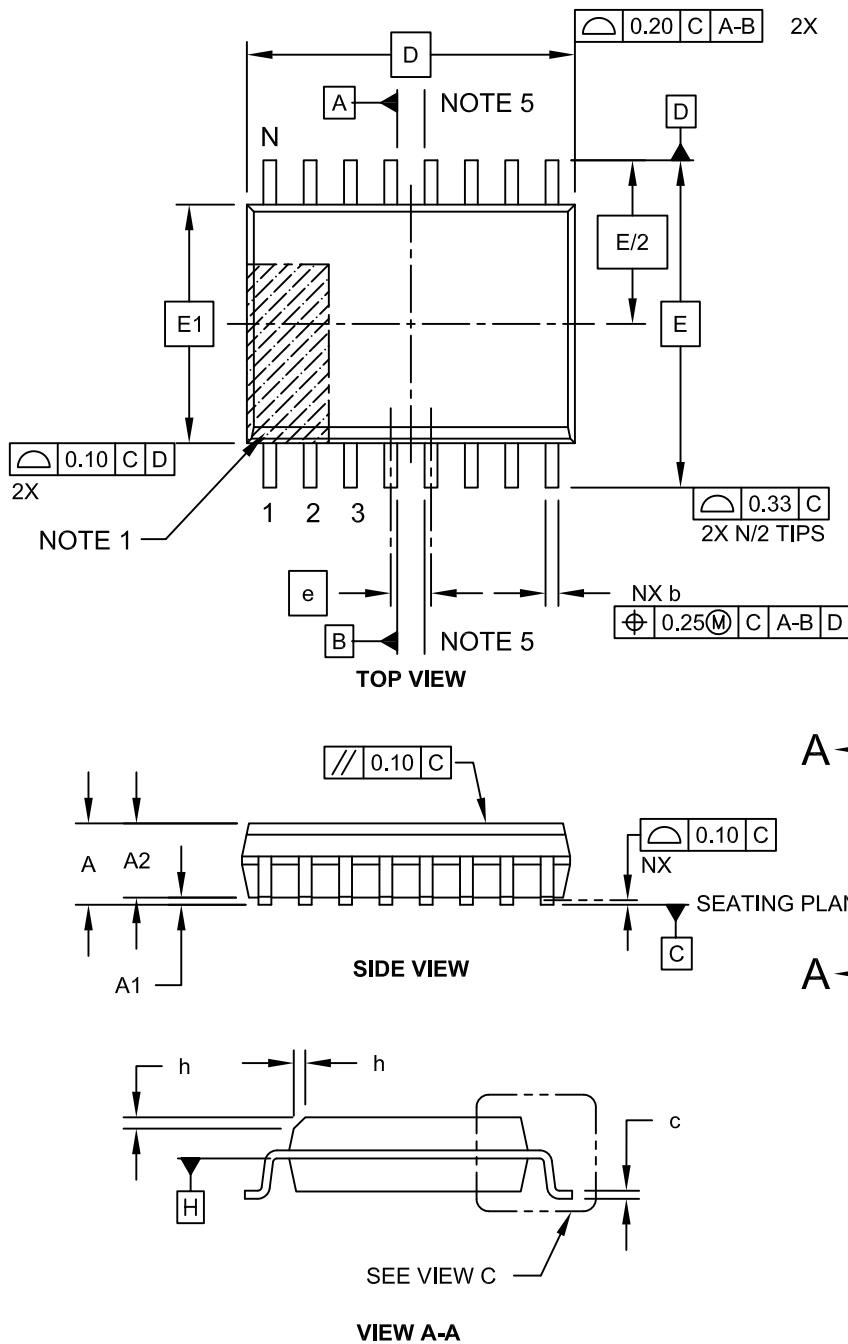
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2056C

Packaging Diagrams and Parameters

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

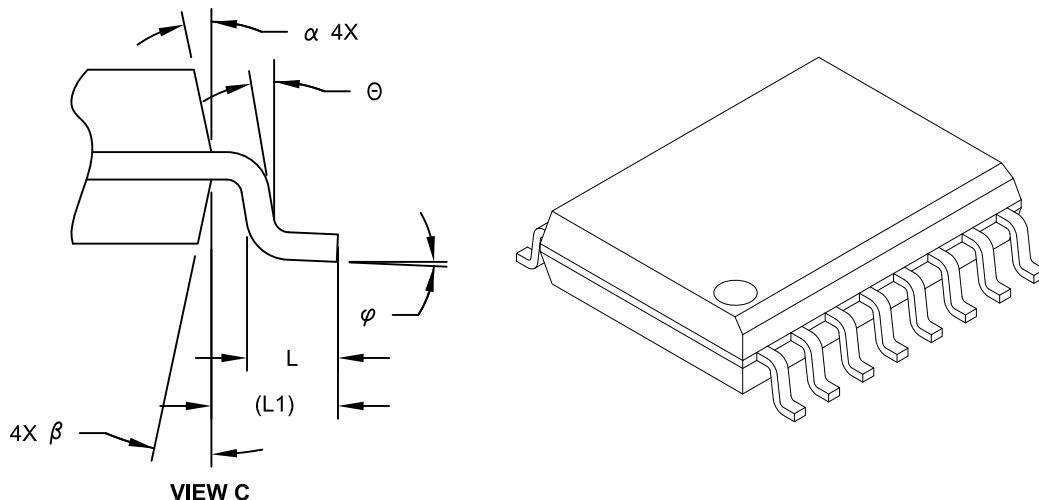
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 | | |
| Lead Angle | Θ | 0° | - | - | |
| 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. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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.

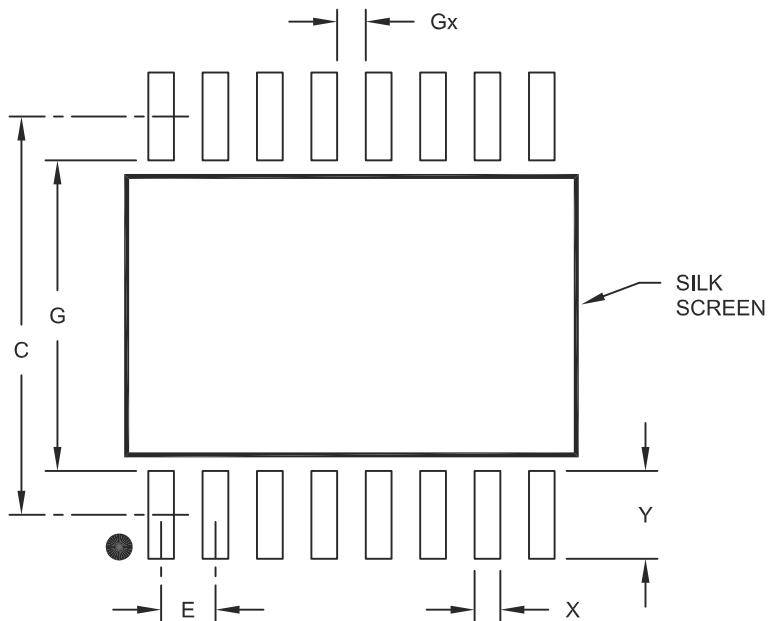
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. Datums A & B to be determined at Datum H.

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

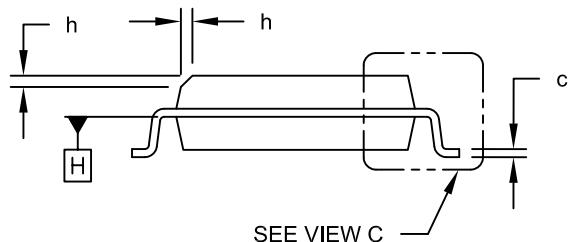
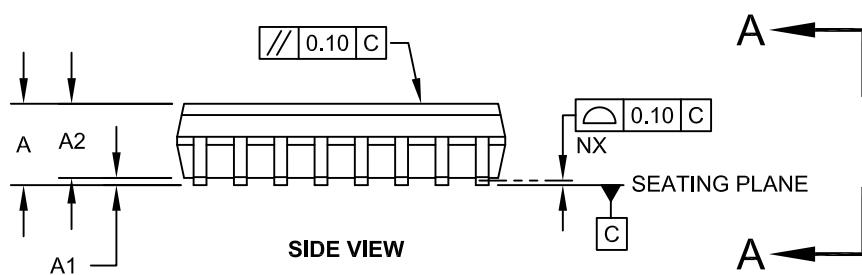
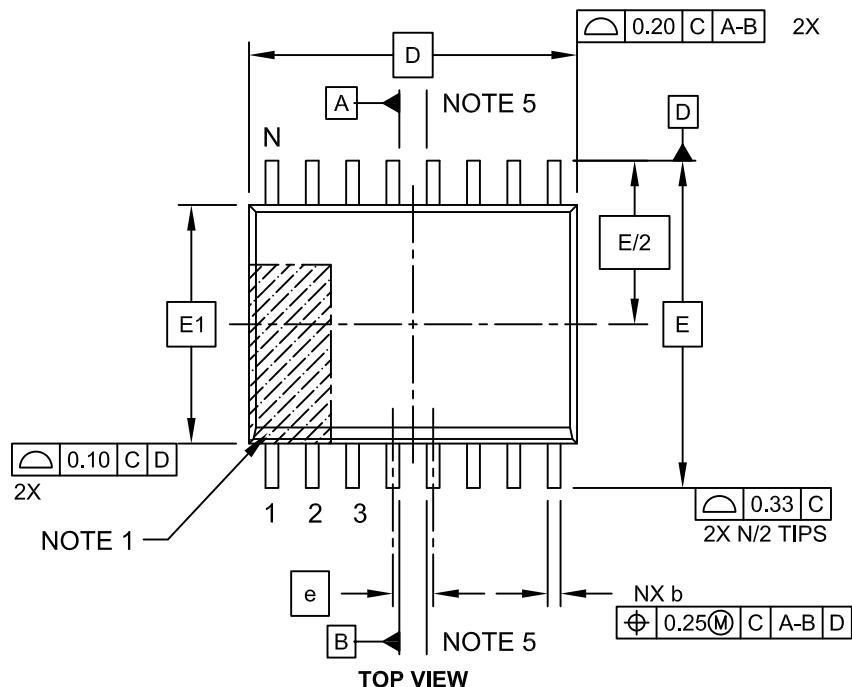
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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>

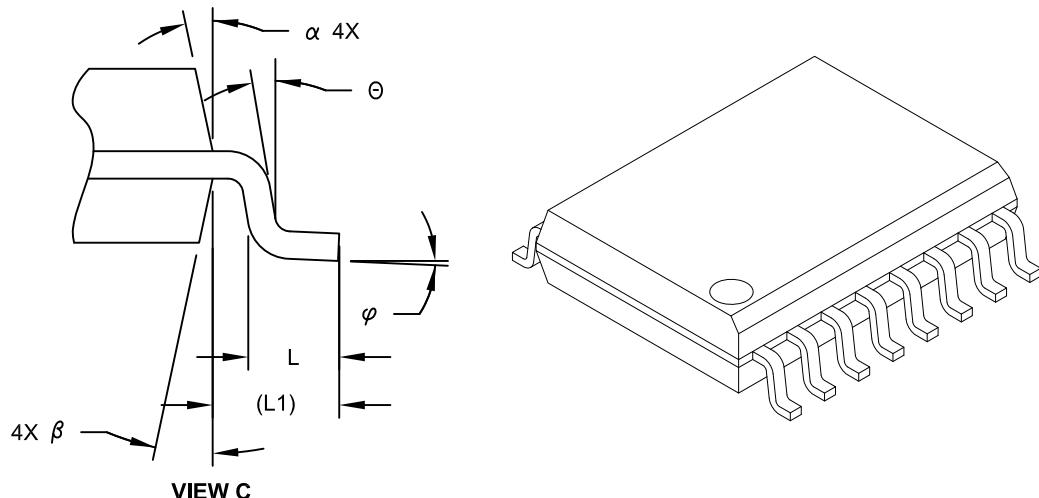


VIEW A-A

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 | - |
| 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 | |
| Lead Angle | Θ | 0° | - | - |
| 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. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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.

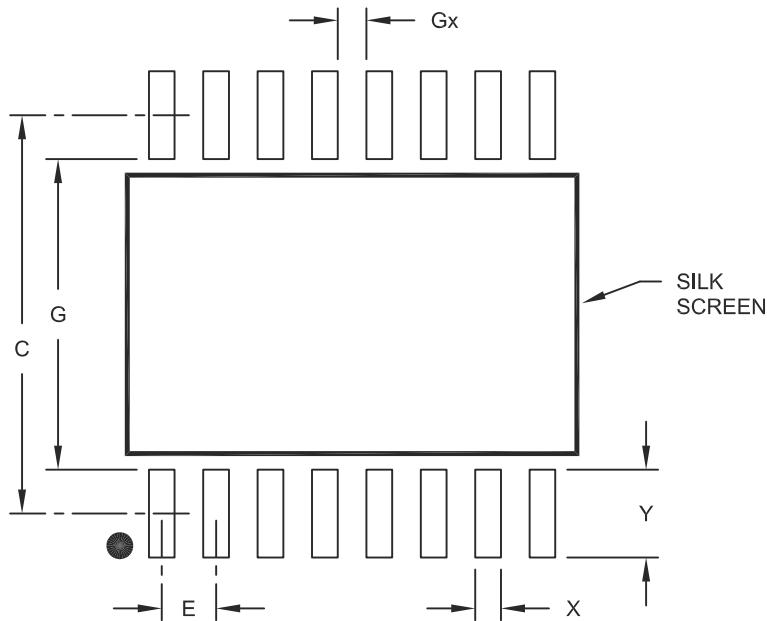
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. Datums A & B to be determined at Datum H.

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

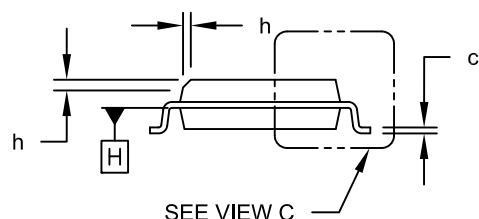
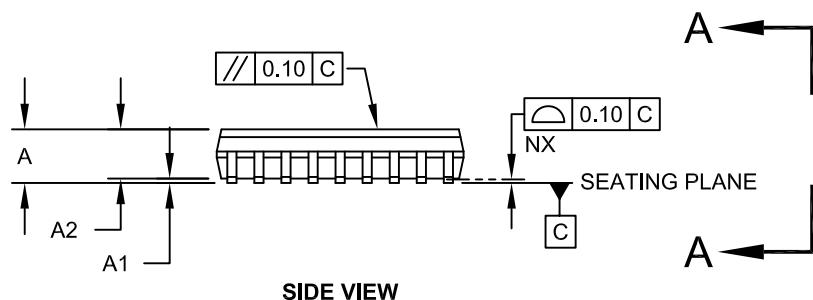
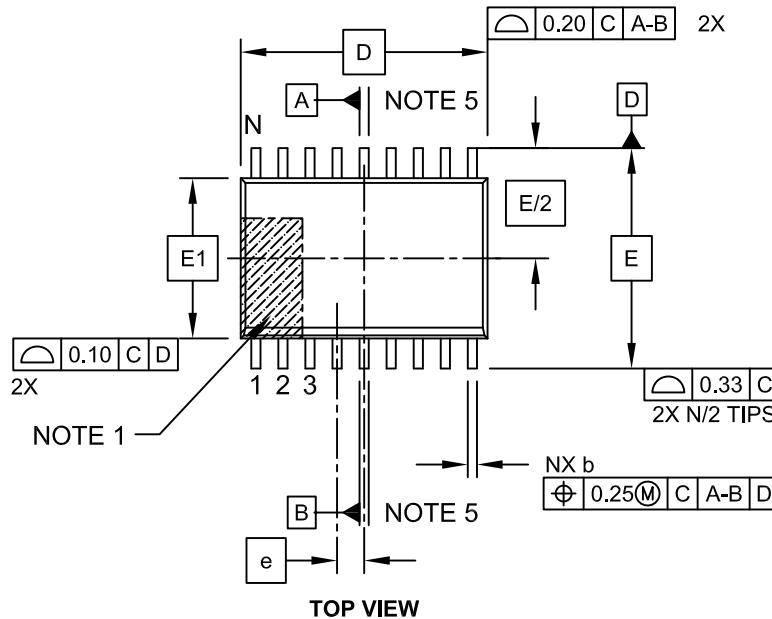
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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>

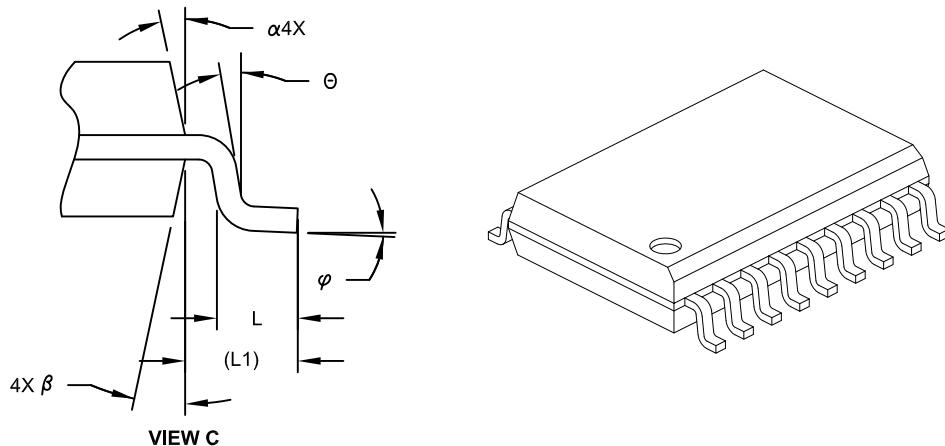


VIEW A-A

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>



| | | 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 | - |
| 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 | | |
| Lead Angle | θ | 0° | - | - |
| 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. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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.

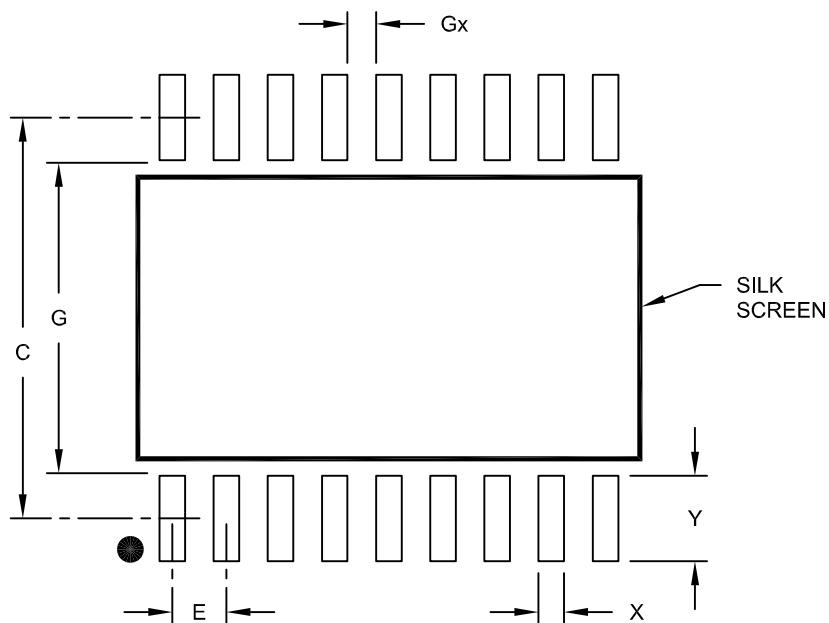
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. Datums A & B to be determined at Datum H.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Dimension | Limits | UNITS MILLIMETERS | | |
|-----------------------|--------|-------------------|------|------|
| | | 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

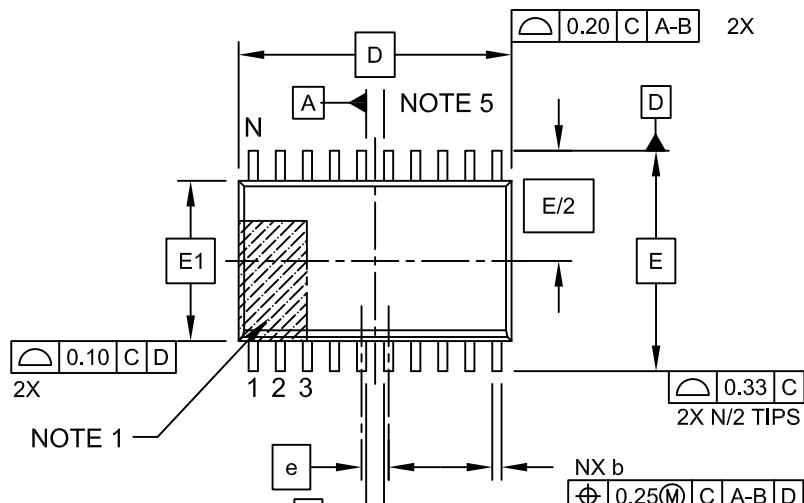
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2051A

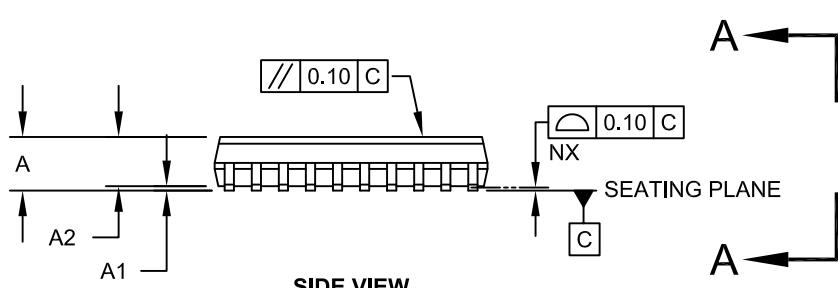
Packaging Diagrams and Parameters

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

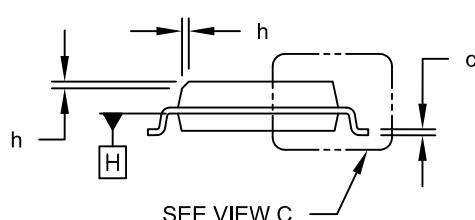
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



TOP VIEW



SIDE VIEW

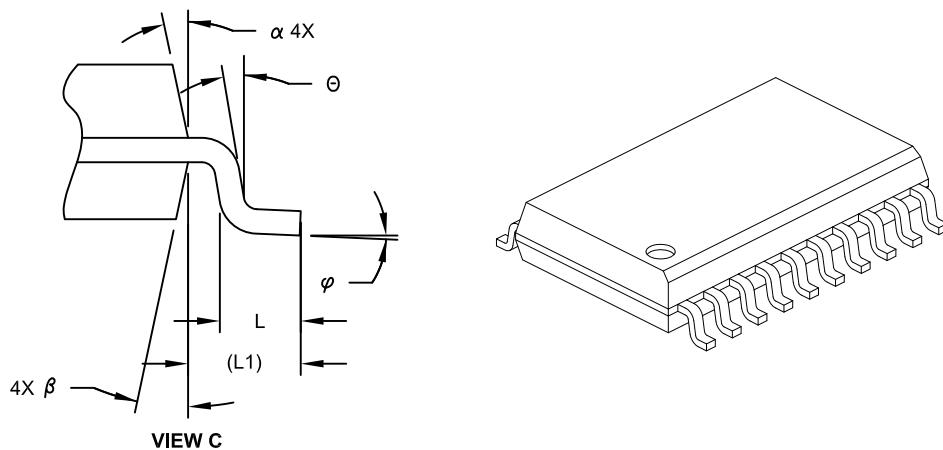


VIEW A-A

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>



| Dimension Limits | Units | MILLIMETERS | | |
|--------------------------|-------|-------------|------|------|
| | | 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 | - |
| 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 | | |
| Lead Angle | Θ | 0° | - | - |
| 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. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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.

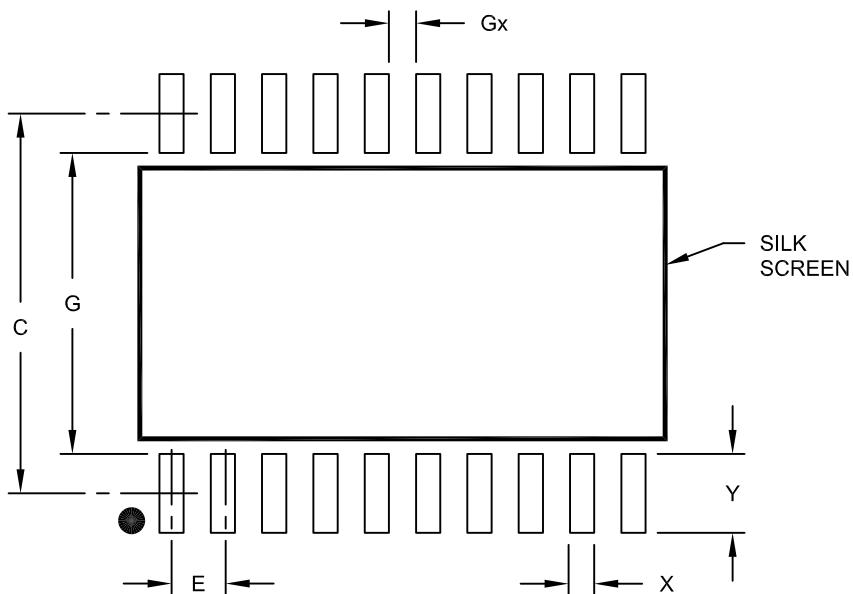
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. Datums A & B to be determined at Datum H.

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|--------------------------|----|-------------|------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | | 1.27 BSC | | |
| Contact Pad Spacing | C | | 9.40 | |
| Contact Pad Width (X20) | X | | | 0.60 |
| Contact Pad Length (X20) | Y | | | 1.95 |
| Distance Between Pads | Gx | 0.67 | | |
| Distance Between Pads | G | 7.45 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

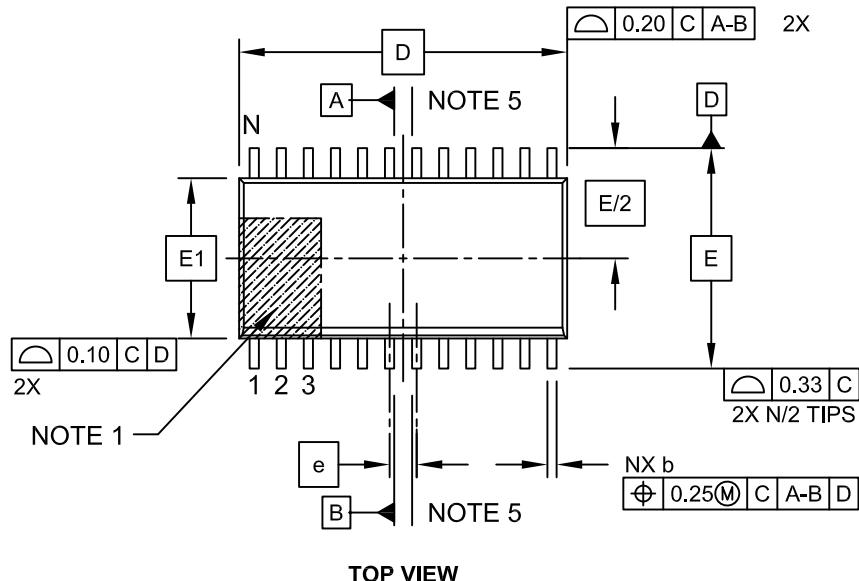
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2094A

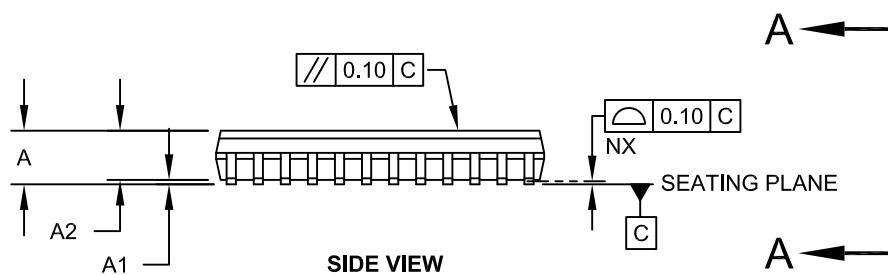
Packaging Diagrams and Parameters

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

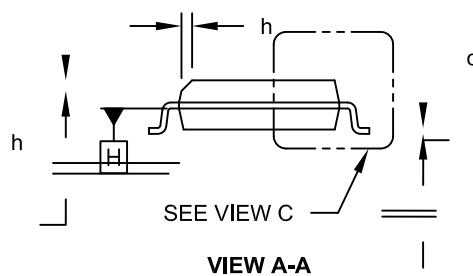
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



TOP VIEW



SIDE VIEW

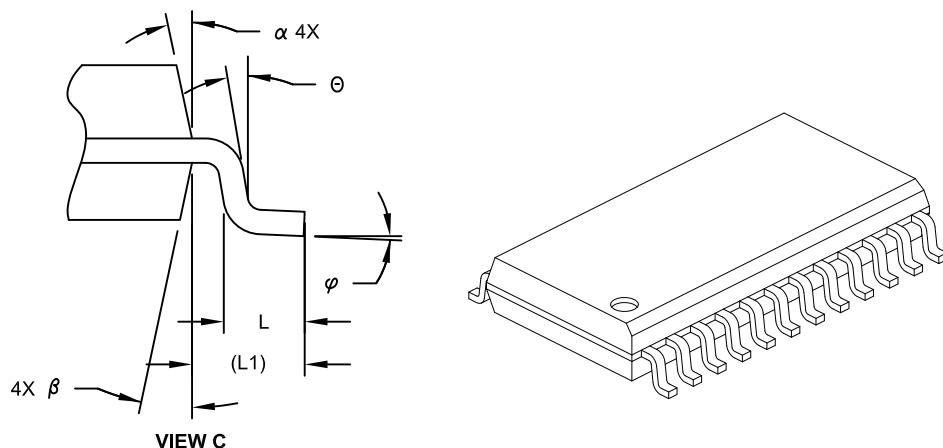


VIEW A-A

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 | | 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 | - |
| 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 | | |
| Lead Angle | θ | 0° | - | - |
| 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. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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.

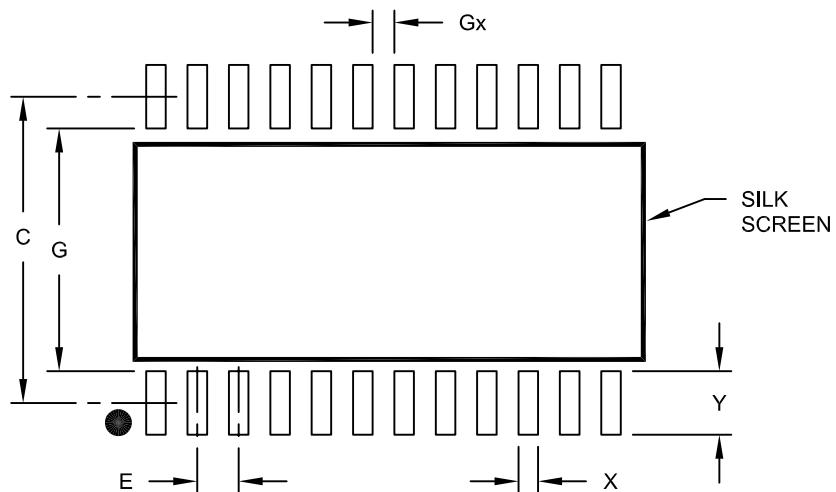
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. Datums A & B to be determined at Datum H.

Land Pattern (Footprint)

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>



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 (X24) | X | | | 0.60 |
| Contact Pad Length (X24) | Y | | | 2.00 |
| Distance Between Pads | Gx | 0.67 | | |
| Distance Between Pads | G | 7.40 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

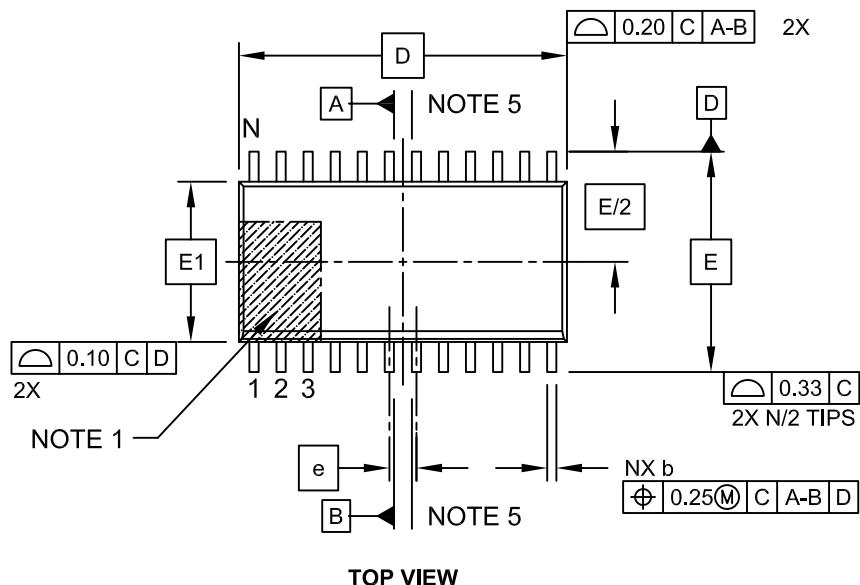
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2025A

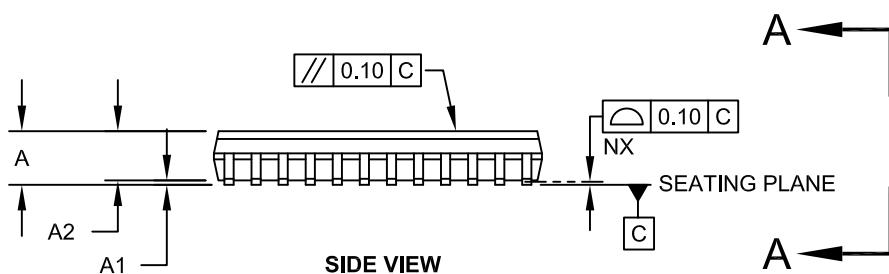
Packaging Diagrams and Parameters

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

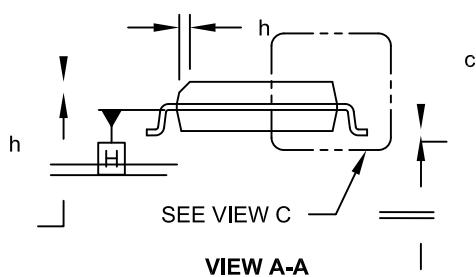
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



TOP VIEW



SIDE VIEW



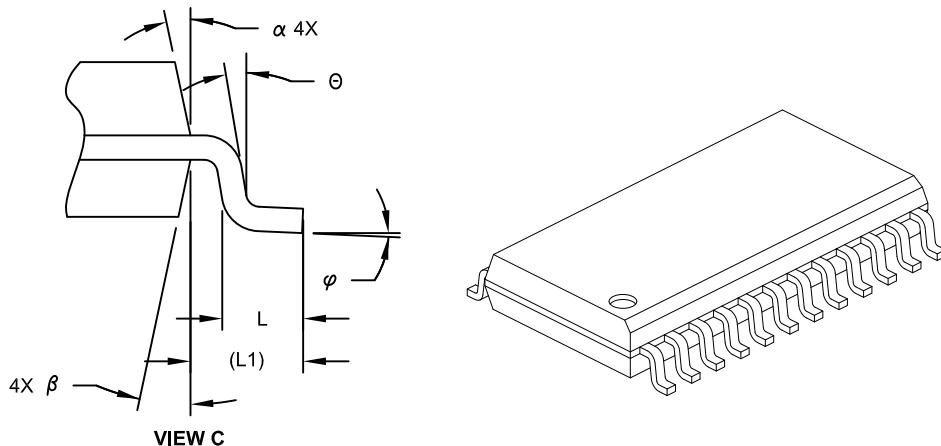
VIEW A-A

Microchip Technology Drawing C04-025C Sheet 1 of 2

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 | | | |
| Lead Angle | θ | 0° | - | - | |
| 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. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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.

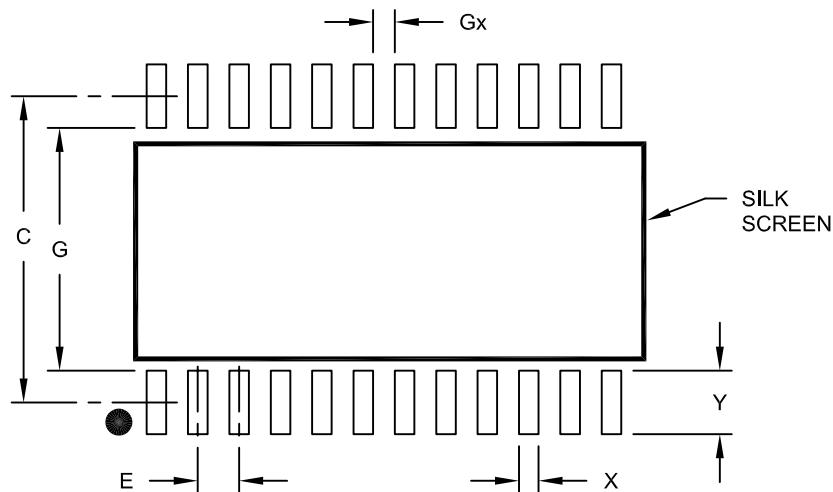
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. Datums A & B to be determined at Datum H.

Land Pattern (Footprint)

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>



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 (X24) | X | | | 0.60 |
| Contact Pad Length (X24) | Y | | | 2.00 |
| Distance Between Pads | Gx | 0.67 | | |
| Distance Between Pads | G | 7.40 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

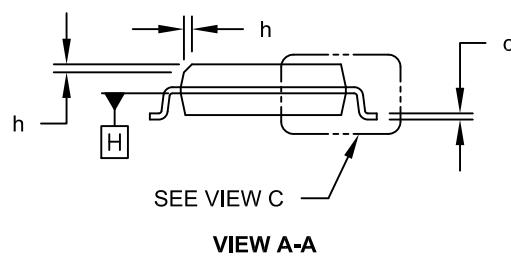
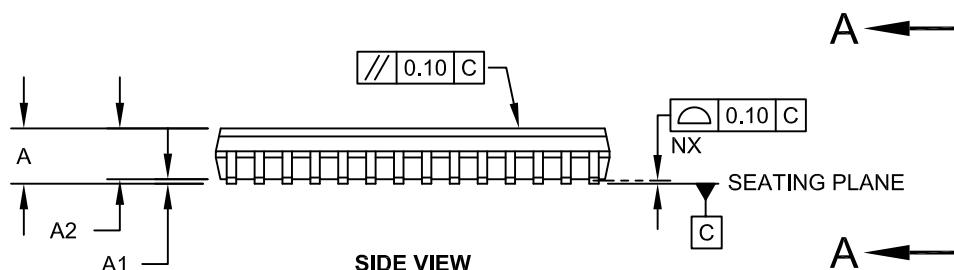
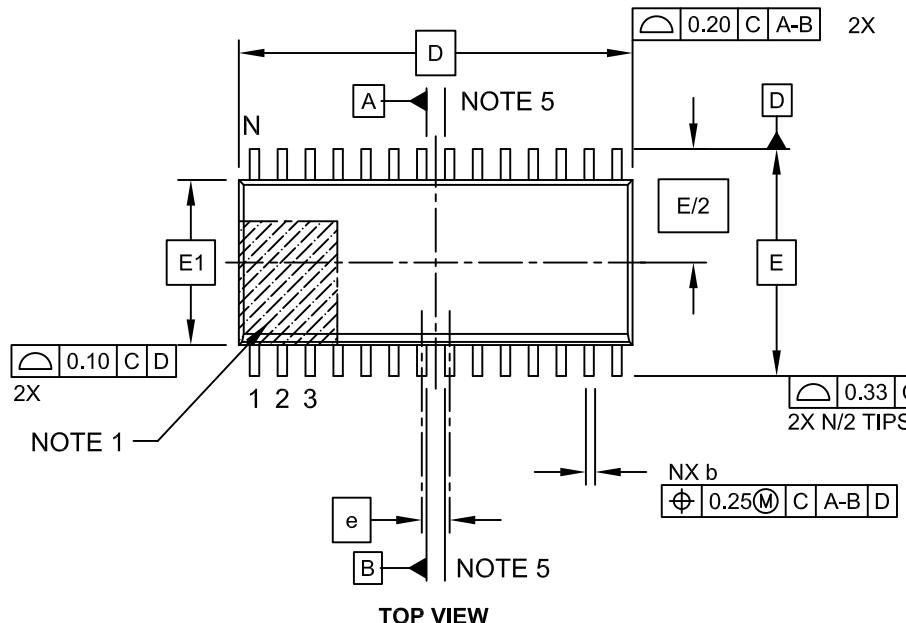
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2025A

Packaging Diagrams and Parameters

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

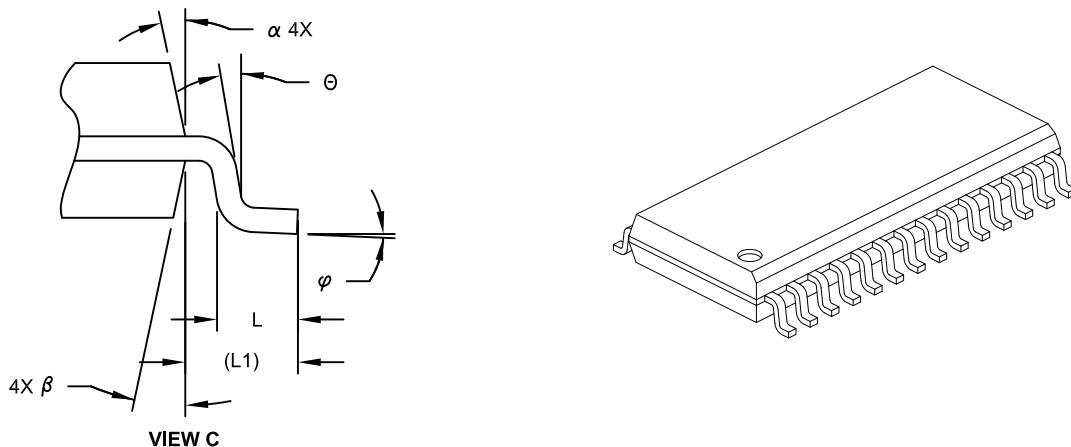
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 | 28 | | |
| Pitch | e | 1.27 | BSC | |
| Overall Height | A | - | - | 2.65 |
| Molded Package Thickness | A2 | 2.05 | - | - |
| Standoff | § | 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 | | |
| Lead Angle | θ | 0° | - | - |
| Foot Angle | 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° |

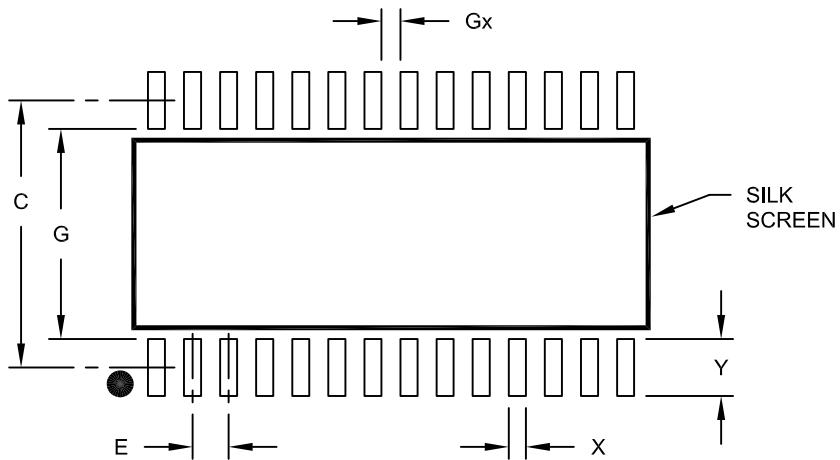
Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
 2. § Significant Characteristic
 3. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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. Datums A & B to be determined at Datum H.

Land Pattern (Footprint)

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>



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 (X28) | X | | | 0.60 |
| Contact Pad Length (X28) | Y | | | 2.00 |
| Distance Between Pads | Gx | 0.67 | | |
| Distance Between Pads | G | 7.40 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

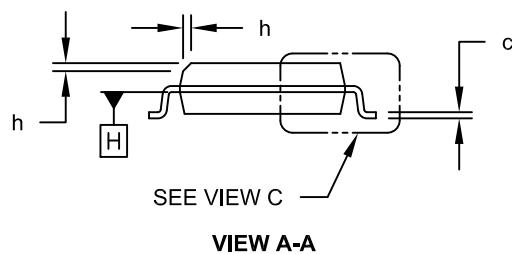
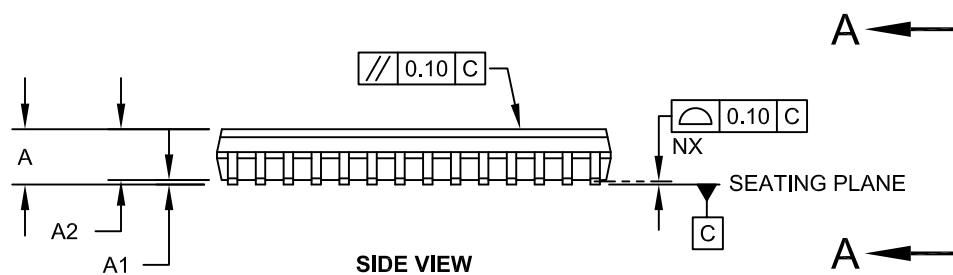
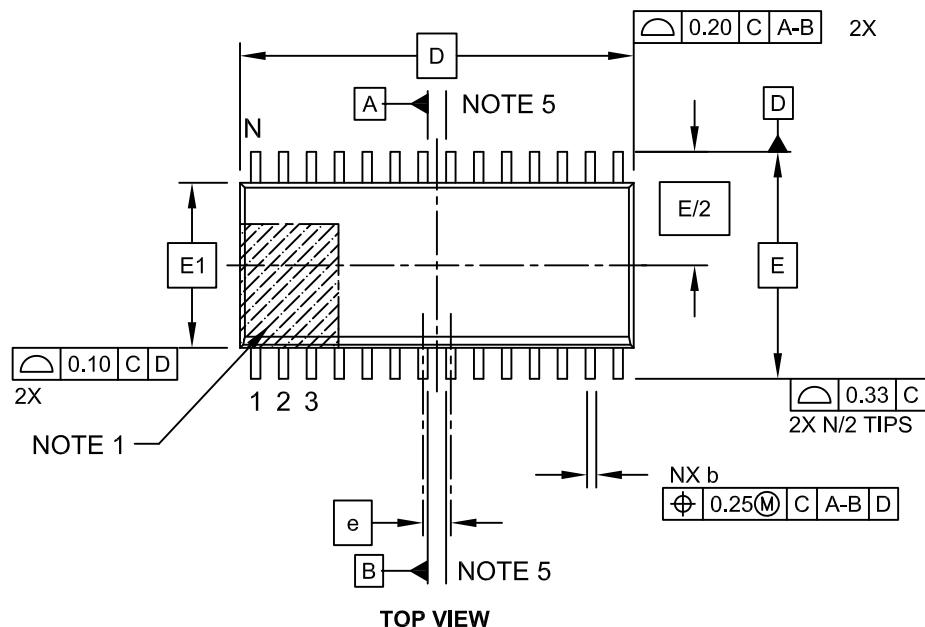
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2052A

Packaging Diagrams and Parameters

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

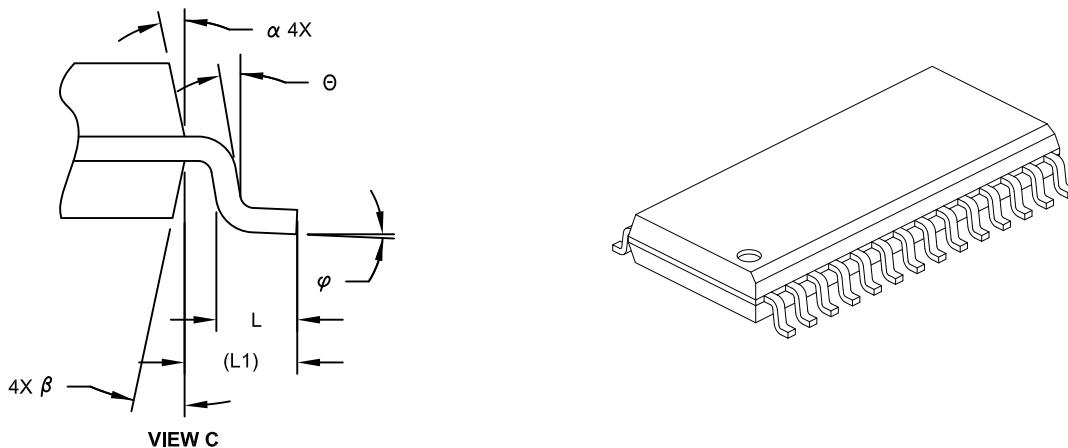
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

28-Lead Plastic Small Outline (O) - 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 | | 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 | |
| Lead Angle | θ | 0° | - | - | |
| Foot Angle | 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. Dimension D does not include mold flash, protrusions or gate burrs, which shall not exceed 0.15 mm per end. Dimension E1 does not include interlead flash or protrusion, which 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.

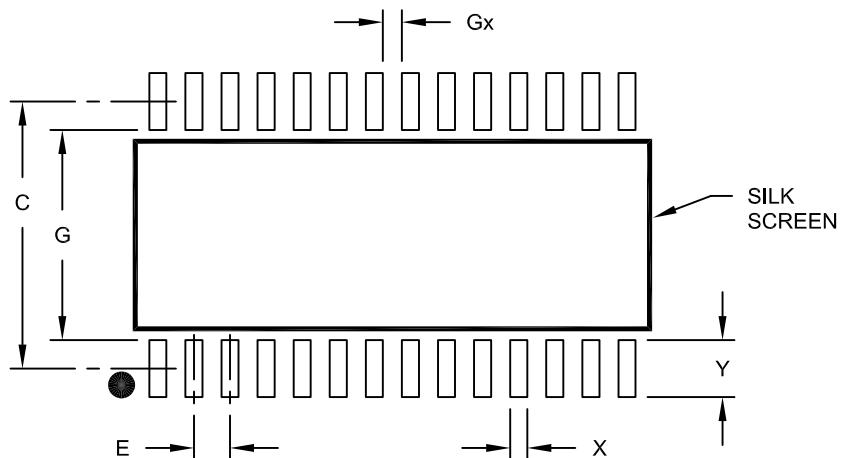
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. Datums A & B to be determined at Datum H.

Land Pattern (Footprint)

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>



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 (X28) | X | | | | 0.60 |
| Contact Pad Length (X28) | 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.

Microchip Technology Drawing No. C04-2052A

Packaging Diagrams and Parameters

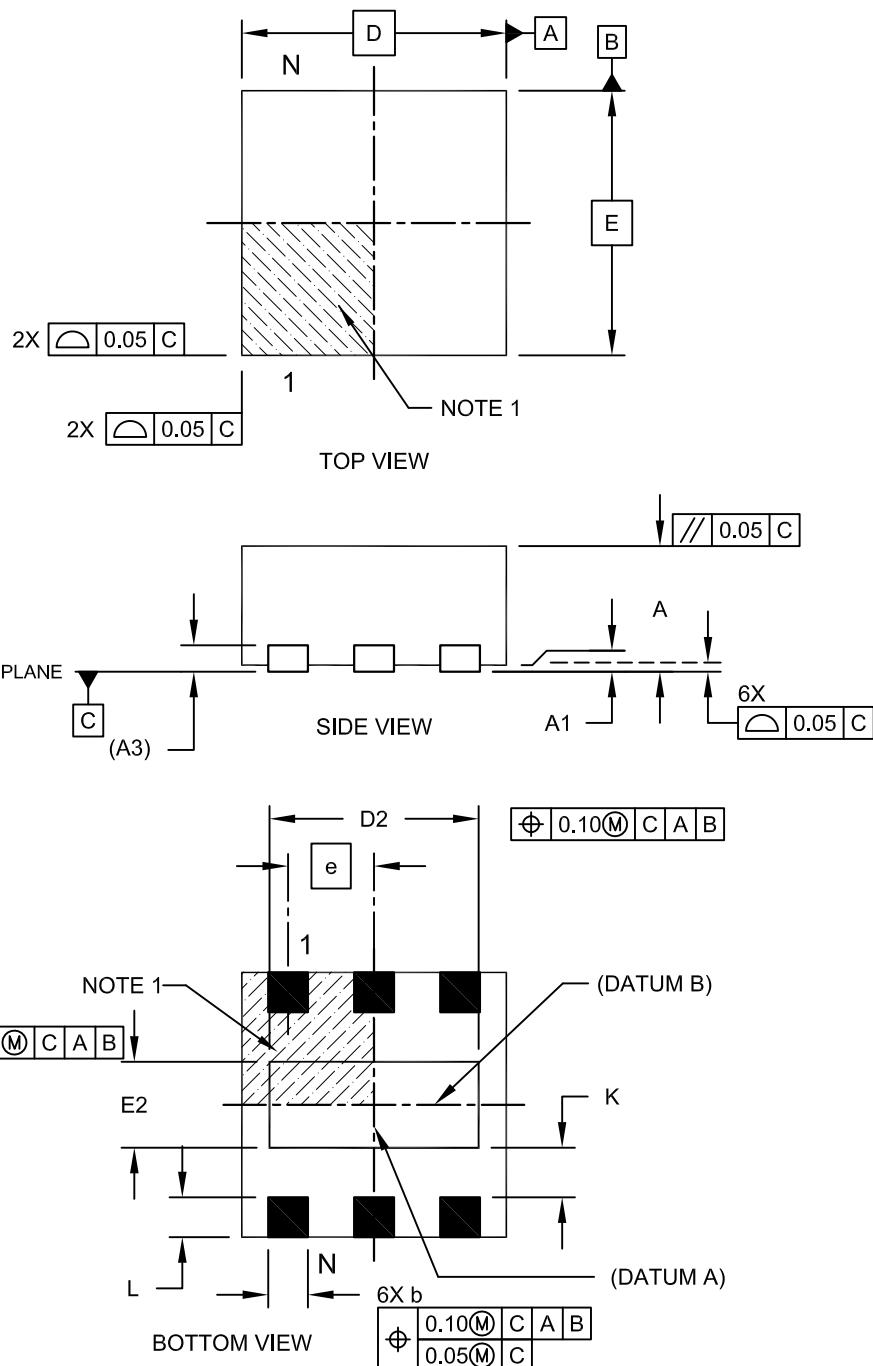
DFN Family

Dual Flat, No Lead Packages

Packaging Diagrams and Parameters

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

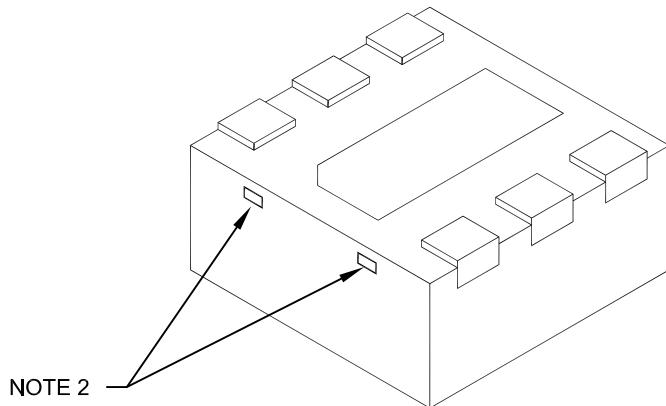
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

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

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 | | 6 | |
| Pitch | e | | 0.65 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 Length | D | 2.00 BSC | | |
| Overall Width | E | 2.00 BSC | | |
| Exposed Pad Length | D2 | 1.50 | 1.60 | 1.70 |
| Exposed Pad Width | E2 | 0.90 | 1.00 | 1.10 |
| Contact Width | b | 0.25 | 0.30 | 0.35 |
| Contact Length | L | 0.20 | 0.25 | 0.30 |
| 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.

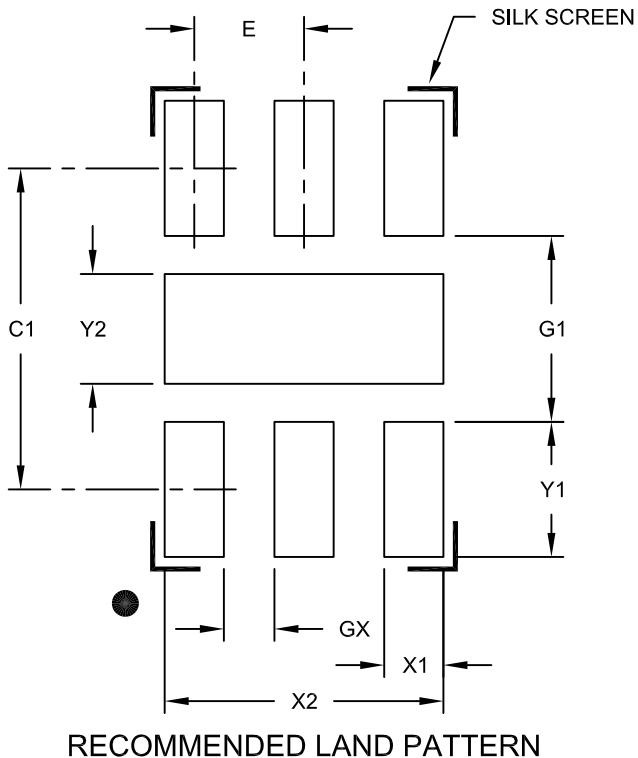
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

6-Lead Plastic Dual Flat, No Lead Package (MA) - 2x2x0.9mm 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 |
| Contact Pitch | | 0.65 BSC | | |
| Optional Center Pad Width | Y2 | | | 1.00 |
| Optional Center Pad Length | X2 | | | 1.70 |
| Contact Pad Spacing | C1 | | 2.10 | |
| Contact Pad Width (X6) | X1 | | | 0.35 |
| Contact Pad Length (X6) | Y1 | | | 0.65 |
| Distance Between Pads | GX | 0.20 | | |
| Distance Between Pads | G1 | 1.10 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

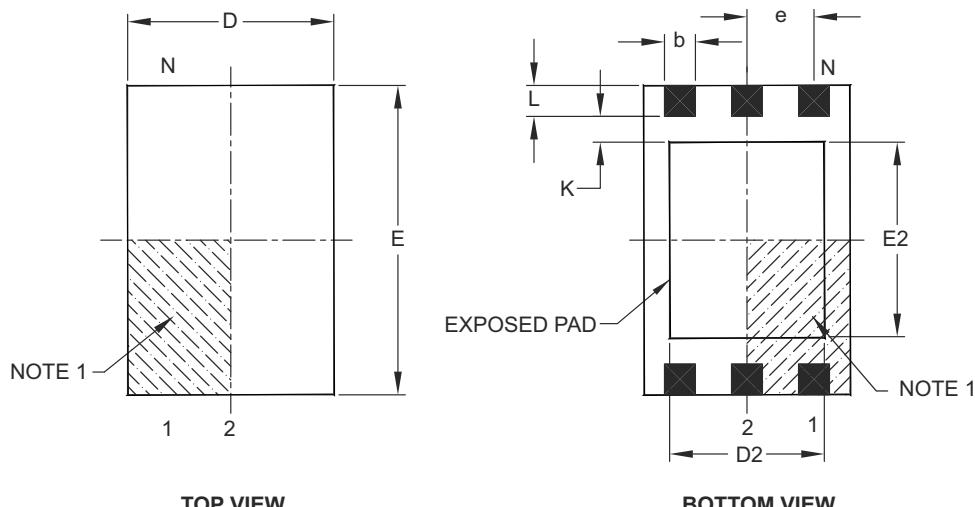
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2120A

Packaging Diagrams and Parameters

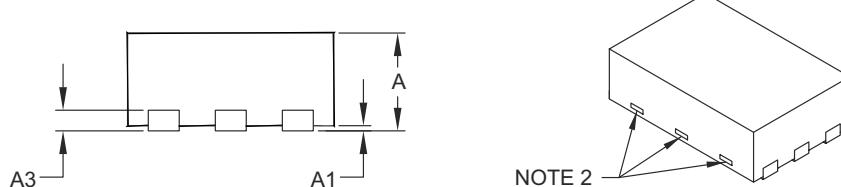
6-Lead Plastic Dual Flat, No Lead Package (ME) – 2x3x0.9 mm Body [DFN]

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



TOP VIEW

BOTTOM VIEW



| | | 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.

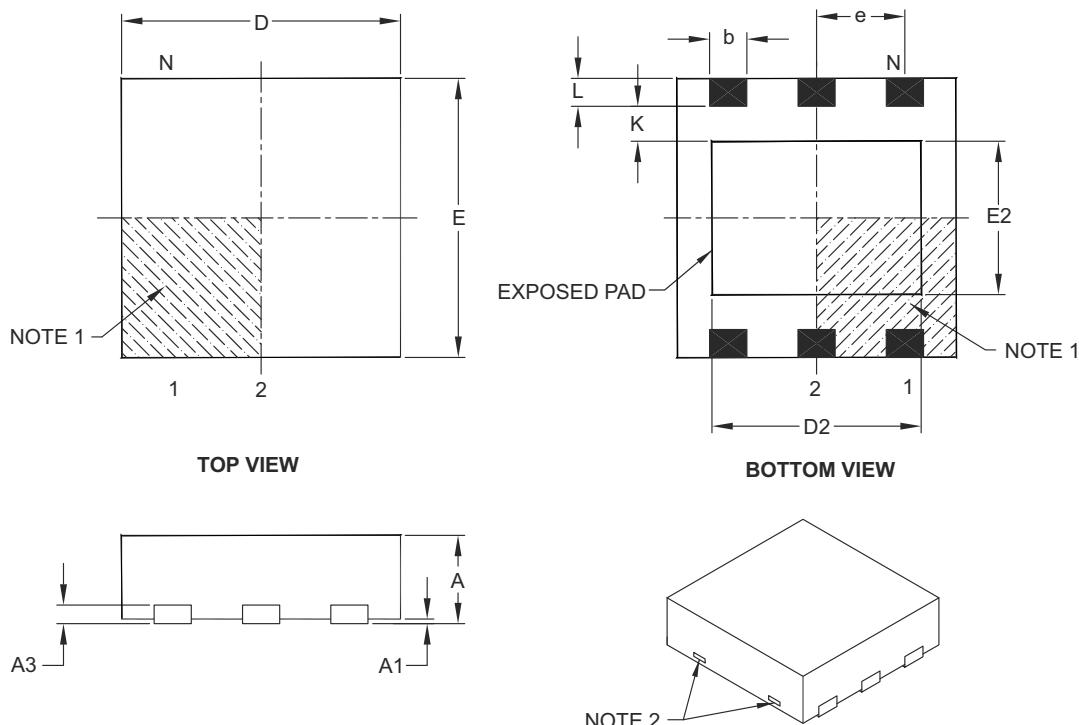
REF: Reference Dimension, usually without tolerance, for information purposes only.

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.

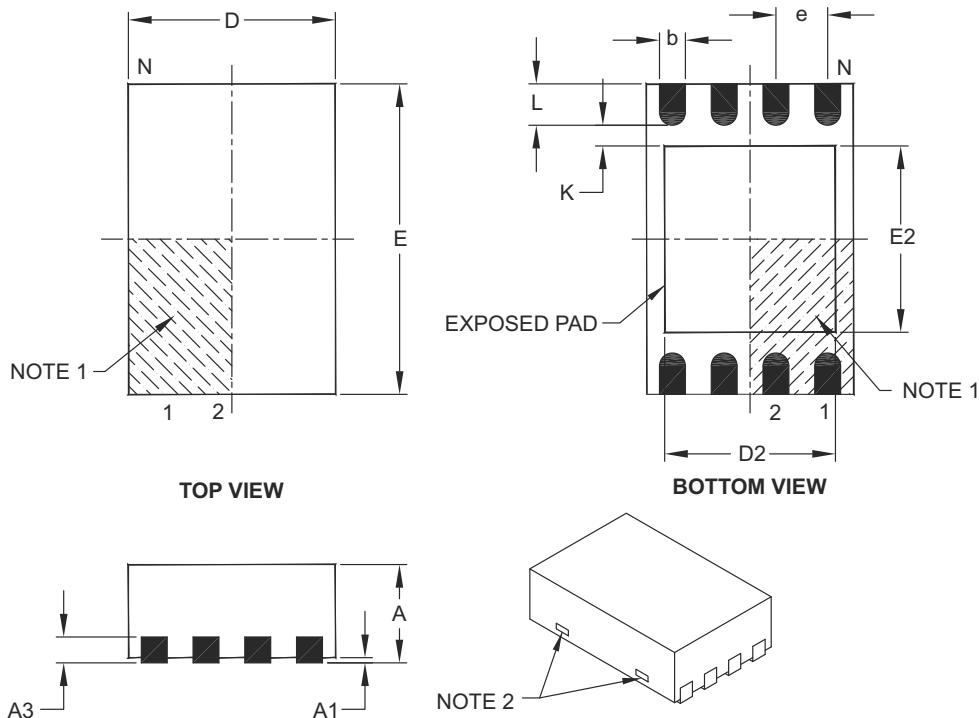
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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.

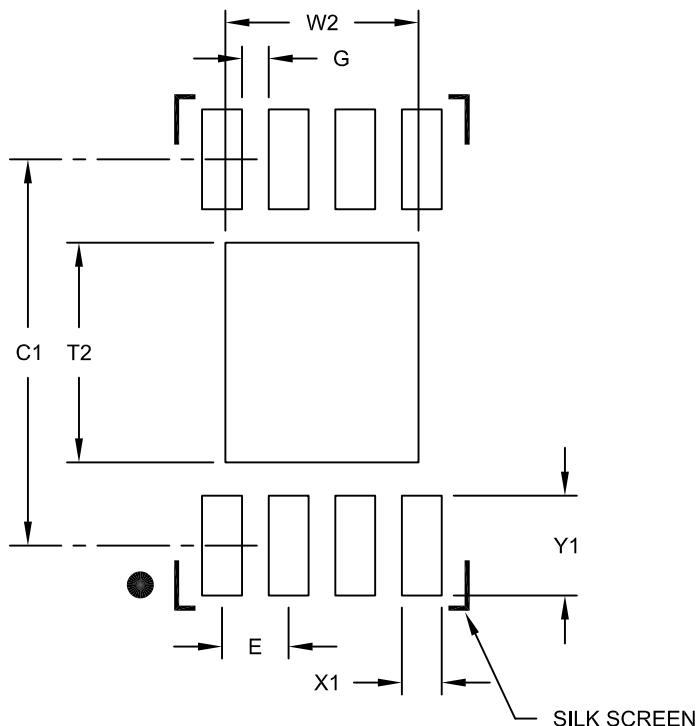
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MC) - 2x3x0.9mm 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

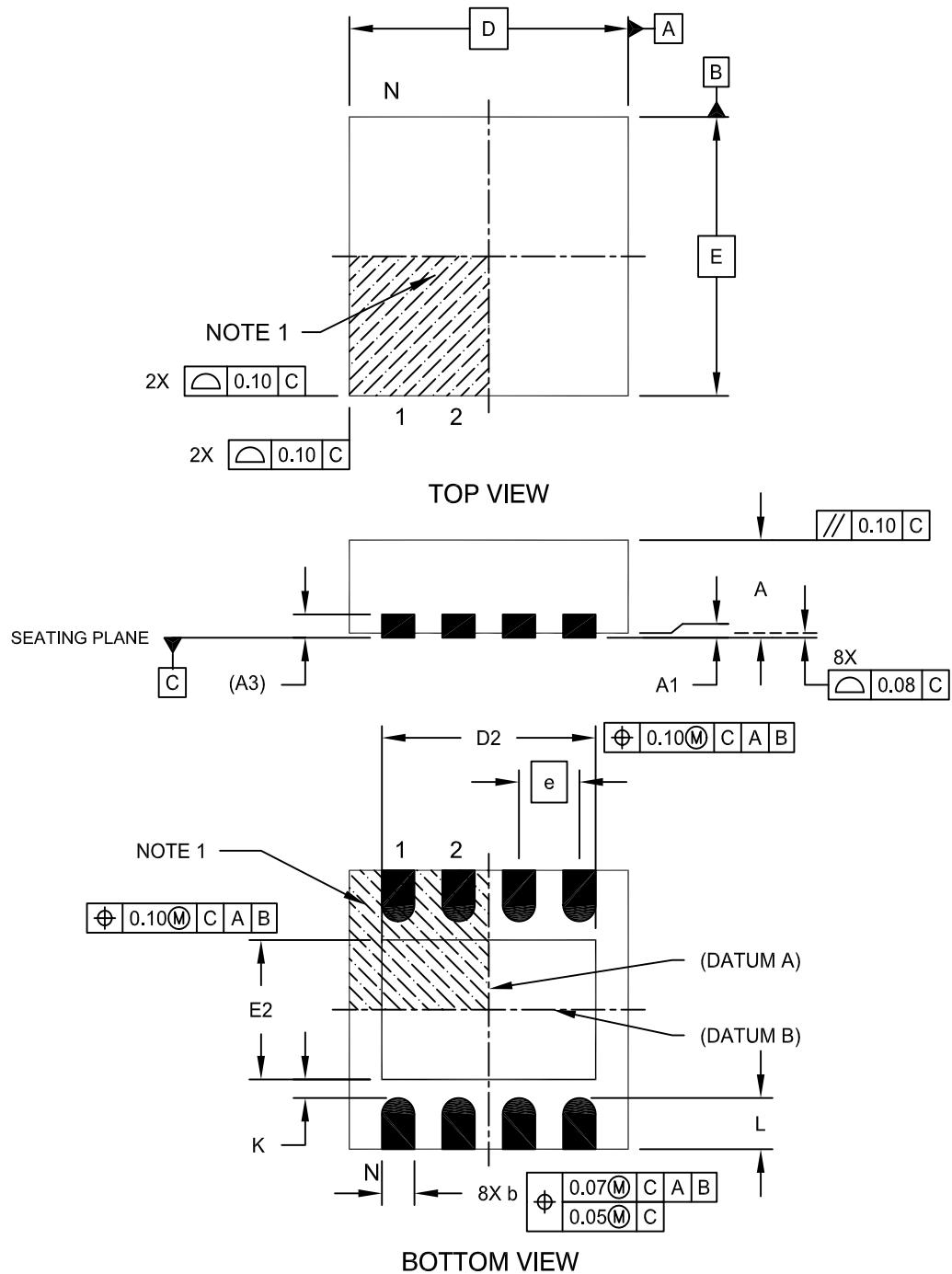
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2123B

Packaging Diagrams and Parameters

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

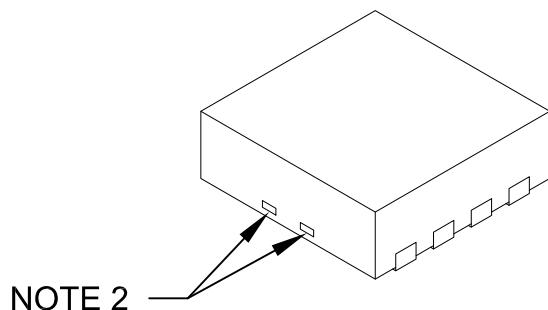
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9mm 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 | 1.34 | - | 1.60 | |
| Overall Width | E | | 3.00 | BSC | |
| Exposed Pad Length | D2 | 1.60 | - | 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

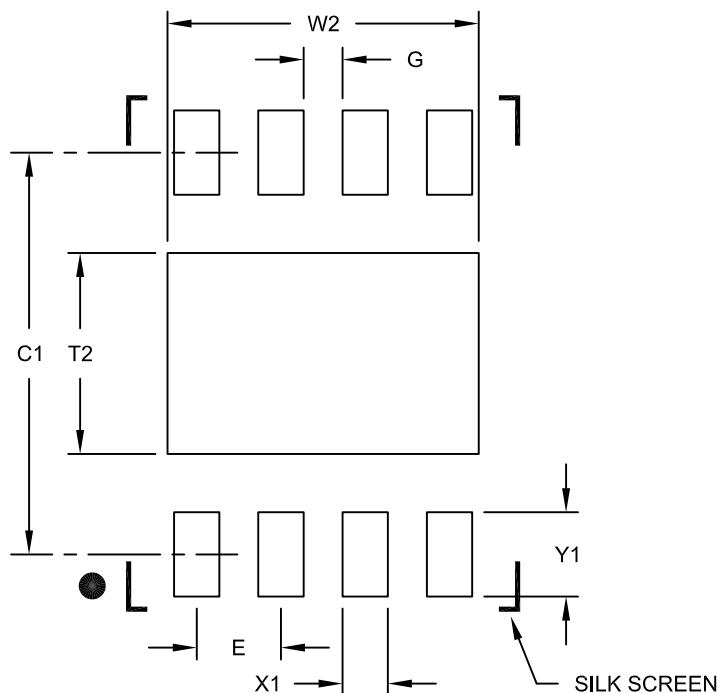
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

8-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9mm 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

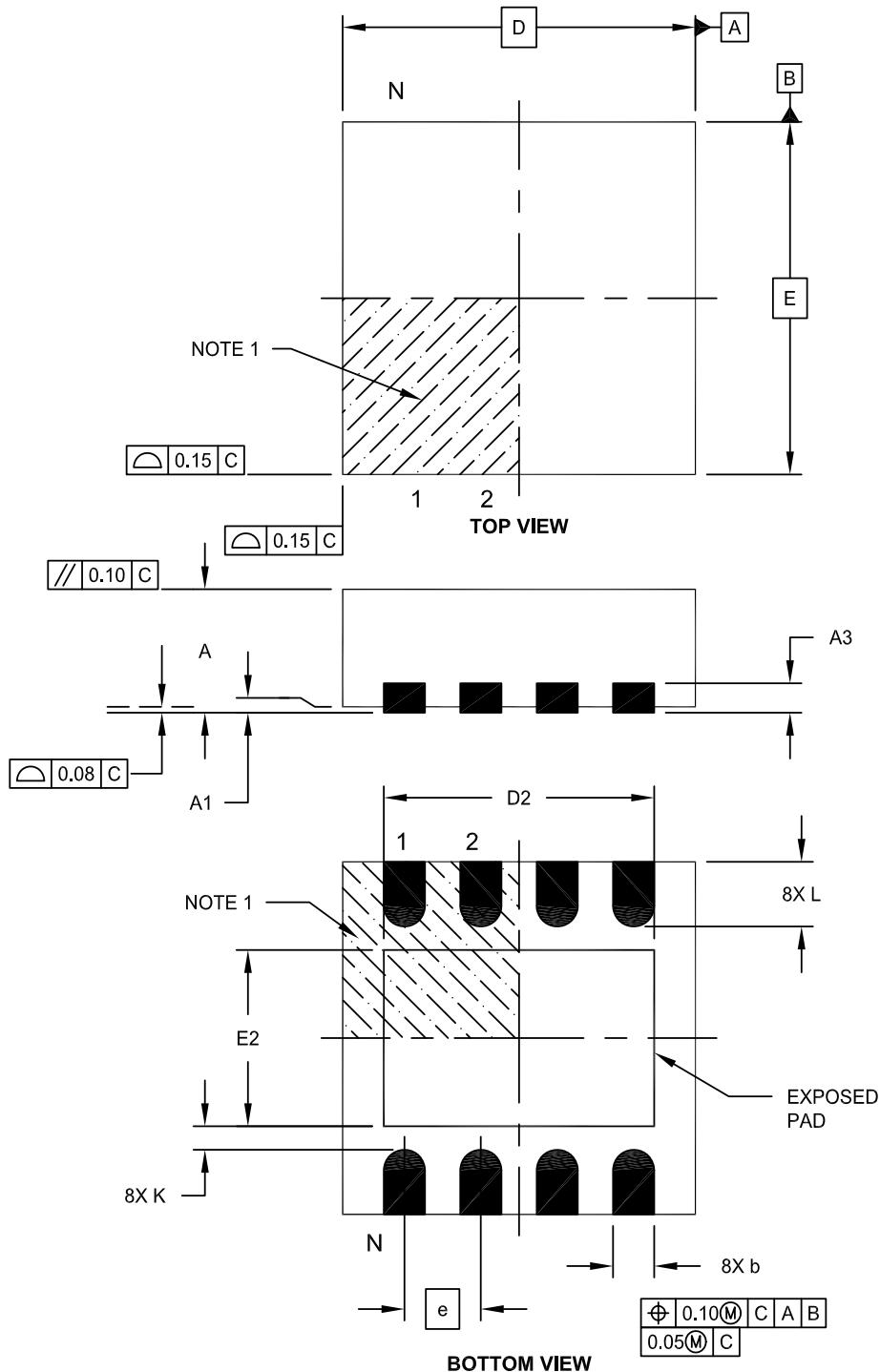
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2062B

Packaging Diagrams and Parameters

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

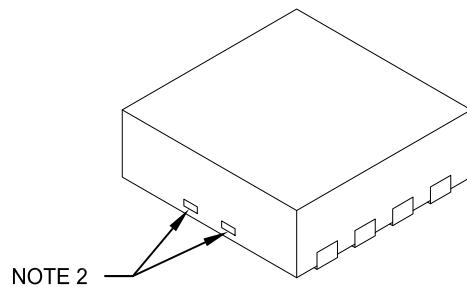
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 | 2.60 | 2.70 | 2.80 |
| Overall Width | E | | 4.00 BSC | |
| Exposed Pad Length | D2 | 3.40 | 3.50 | 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

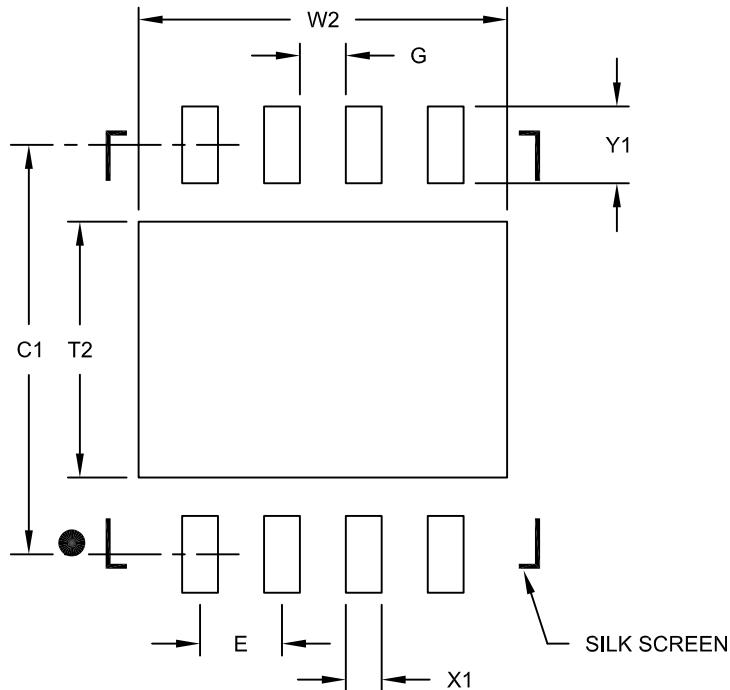
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

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

| Units | | MILLIMETERS | | |
|----------------------------|----|-------------|----------|------|
| Dimension Limits | | 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

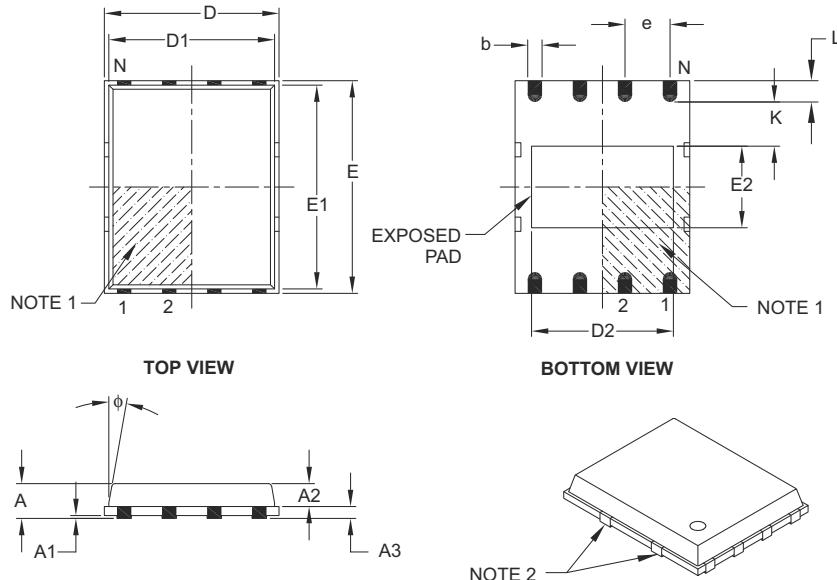
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2131C

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.

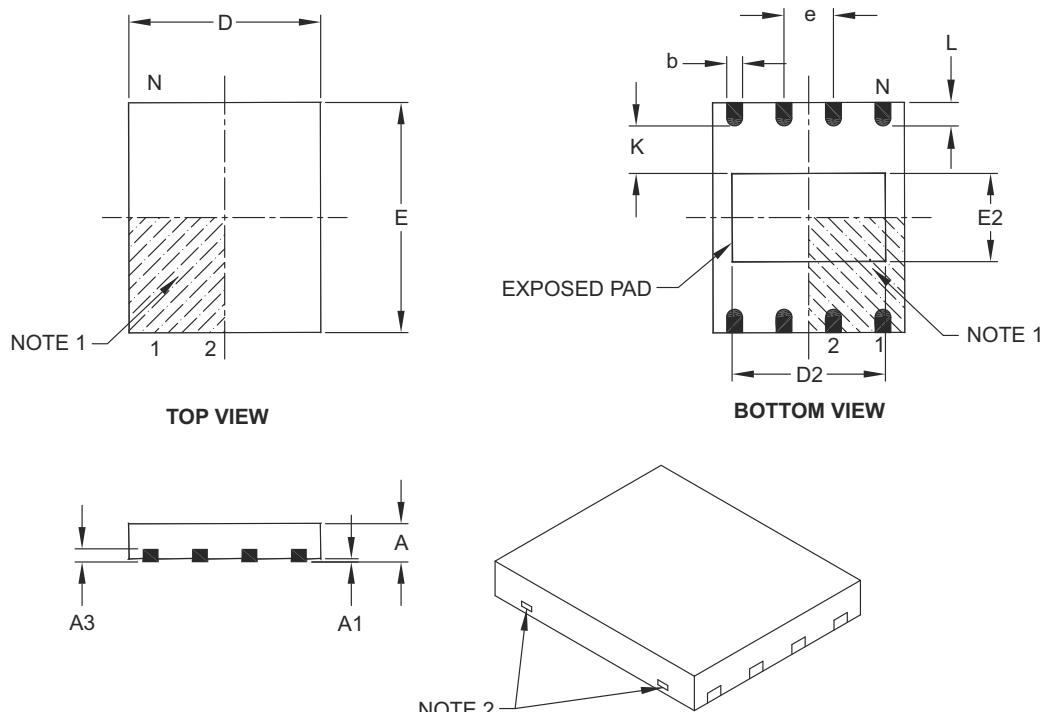
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

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.

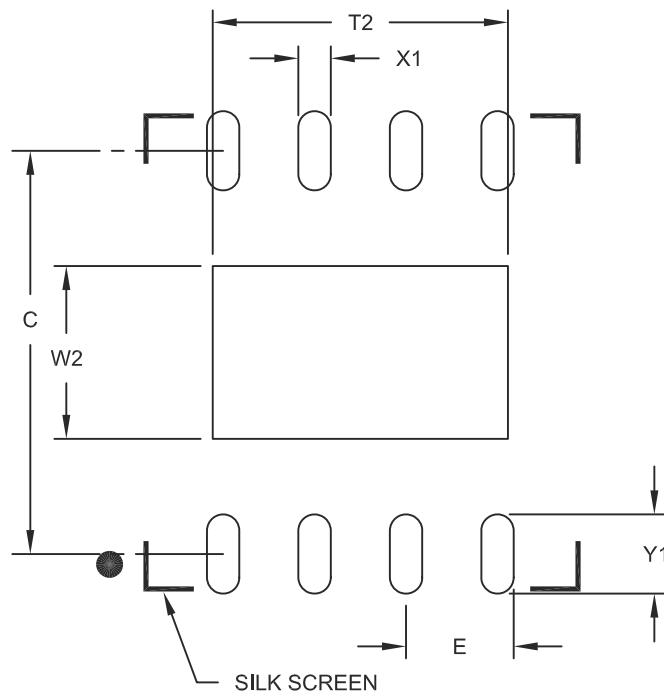
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-122B

Land Pattern (Footprint)

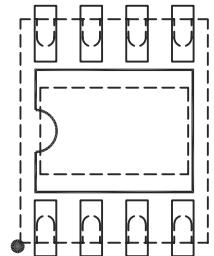
8-Lead Plastic Dual Flat, No Lead Package (MF) - 6x5 mm Body [DFN-S]

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



RECOMMENDED LAND PATTERN

NOTE: THIS PACKAGE MAY ALSO BE
USED WITH THE 8L SOIC (3.90 mm)
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

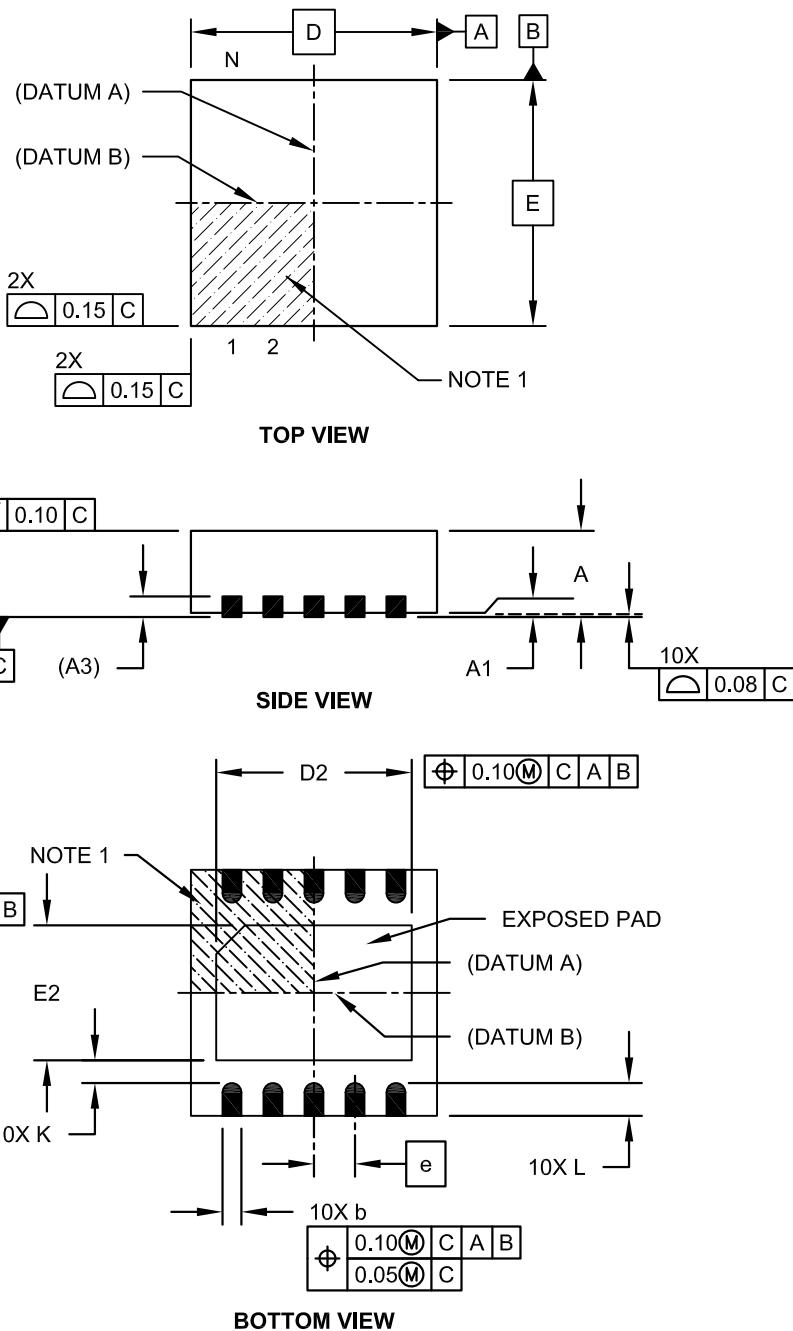
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2122A

Packaging Diagrams and Parameters

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

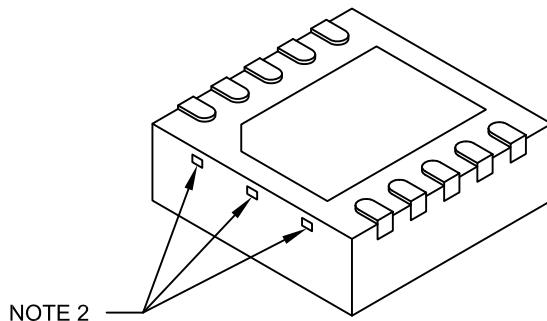
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

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

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 | 10 | | |
| 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 | 3.00 | BSC | |
| Exposed Pad Length | D2 | 2.15 | 2.35 | 2.45 |
| Overall Width | E | 3.00 | BSC | |
| Exposed Pad Width | E2 | 1.40 | 1.50 | 1.75 |
| 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 may have one or more exposed tie bars at ends.
3. Package is saw singulated.
4. Dimensioning and tolerancing per ASME Y14.5M.

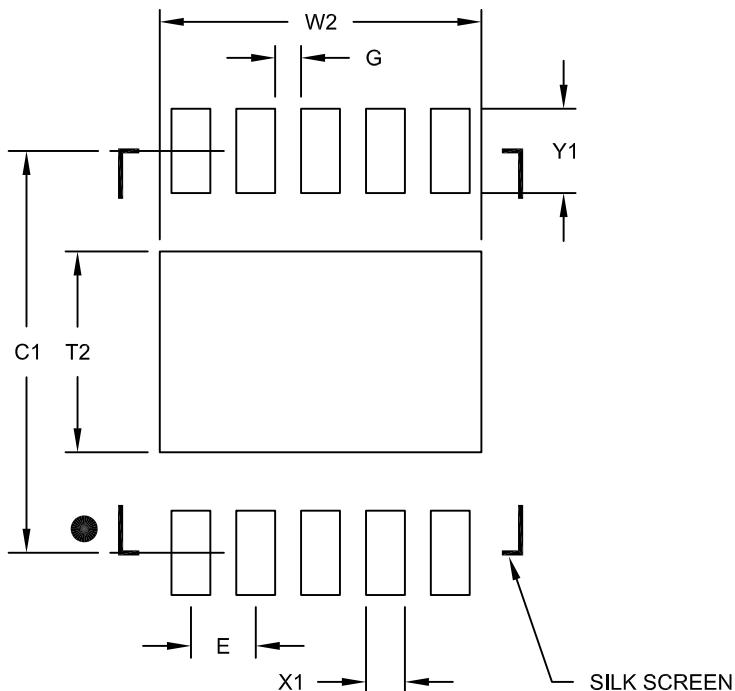
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

10-Lead Plastic Dual Flat, No Lead Package (MF) - 3x3x0.9mm 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 (X10) | X1 | | | 0.30 |
| Contact Pad Length (X10) | 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. C04-2063B

Packaging Diagrams and Parameters

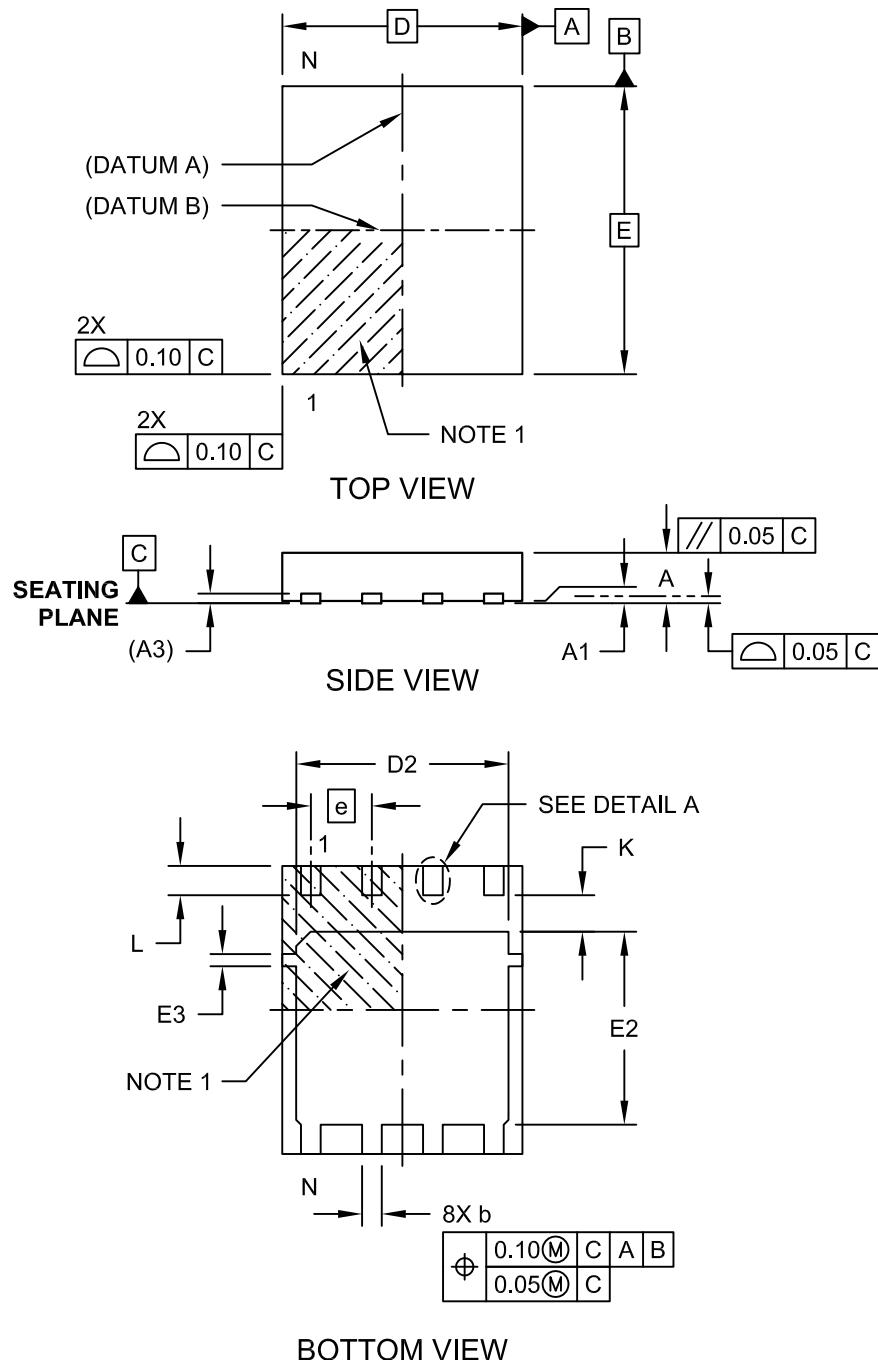
PDFN Family

High Power Dual Flat, No Lead Packages

Packaging Diagrams and Parameters

8-Lead Power Dual Flatpack No Lead Package (MF) – 5x6x1.0 mm Body [PDFN]

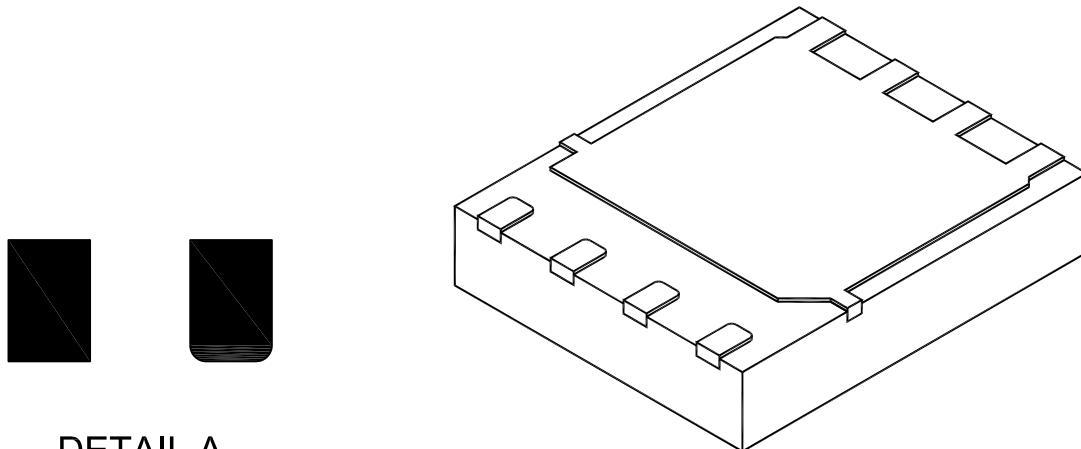
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

8-Lead Power Dual Flatpack No Lead Package (MF) – 5x6x1.0 mm Body [PDFN]

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



DETAIL A

ALTERNATE
CONTACT
SHAPES

| Dimension | Limits | MILLIMETERS | | |
|-------------------------|--------|-------------|----------|------|
| | | MIN | NOM | MAX |
| Number of Pins | N | | 8 | |
| Pitch | e | | 1.27 BSC | |
| Overall Height | A | 0.80 | 1.00 | 1.03 |
| Standoff | A1 | 0.00 | - | 0.05 |
| Terminal Thickness | (A3) | | 0.20 REF | |
| Overall Length | D | | 5.00 BSC | |
| Overall Width | E | | 6.00 BSC | |
| Exposed Pad length | D2 | 4.27 | 4.42 | 4.52 |
| Exposed Pad Width | E2 | 3.87 | 4.02 | 4.12 |
| Tab Width | E3 | 0.20 | 0.25 | 0.30 |
| Terminal Width | b | 0.36 | 0.41 | 0.46 |
| Terminal Length | L | 0.51 | 0.61 | 0.71 |
| Terminal to Exposed Pad | K | 0.71 | 0.76 | 0.81 |

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. Package is saw singulated.
3. Package dimension does not include mold flash, protrusions, burrs or metal smearing.
4. Dimensioning and tolerancing per ASME Y14.5M.

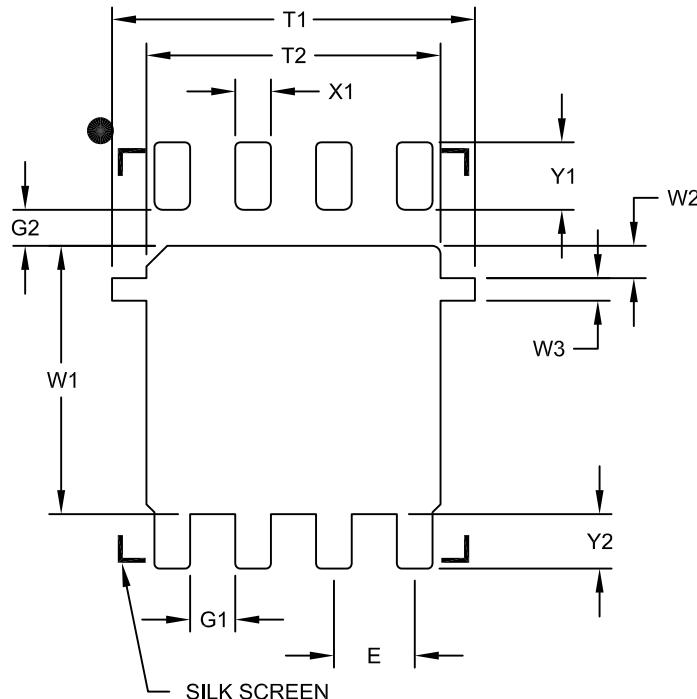
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

8-Lead Power Dual Flatpack No Lead Package (MF) – 5x6x1.0 mm Body [PDFN]

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 | |
| Center Pad Width | W1 | | | 4.22 |
| Pad Edge to Tab | W2 | | 0.51 | |
| Tab Width | W3 | | 0.35 | |
| Center Pad Length With Tabs | T1 | | | 5.70 |
| Center Pad Length | T2 | | | 4.62 |
| Distance Between Terminals | G1 | 0.71 | | |
| Terminal To Center Pad (X4) | G2 | 0.57 | | |
| Terminal Pad Width (X8) | X1 | | | 0.56 |
| Terminal Pad Length (X4) | Y1 | | | 1.06 |
| Terminal Pad Length (X8) | Y2 | | | 0.86 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

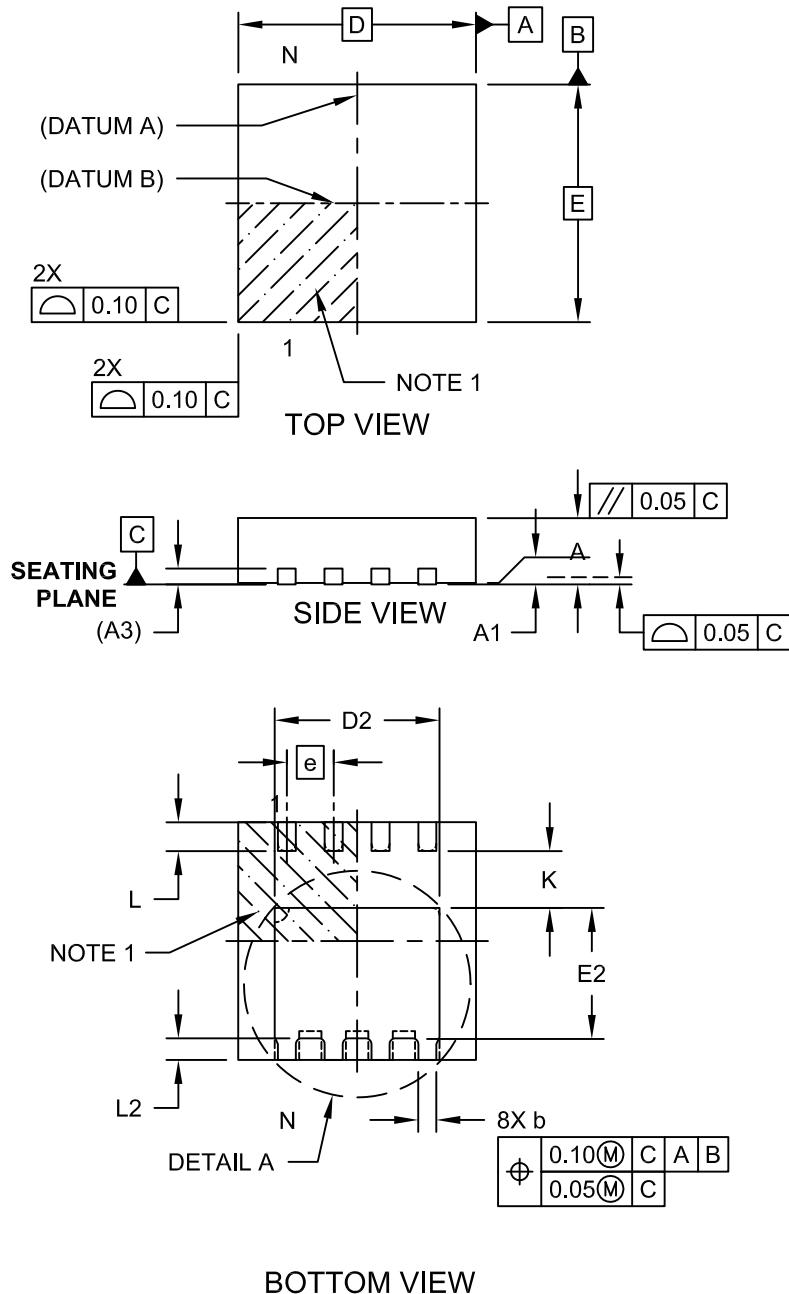
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2188A

Packaging Diagrams and Parameters

8-Lead Power Dual Flatpack No Lead Package (LC) – 3.3x3.3x1.0 mm Body [PDFN]

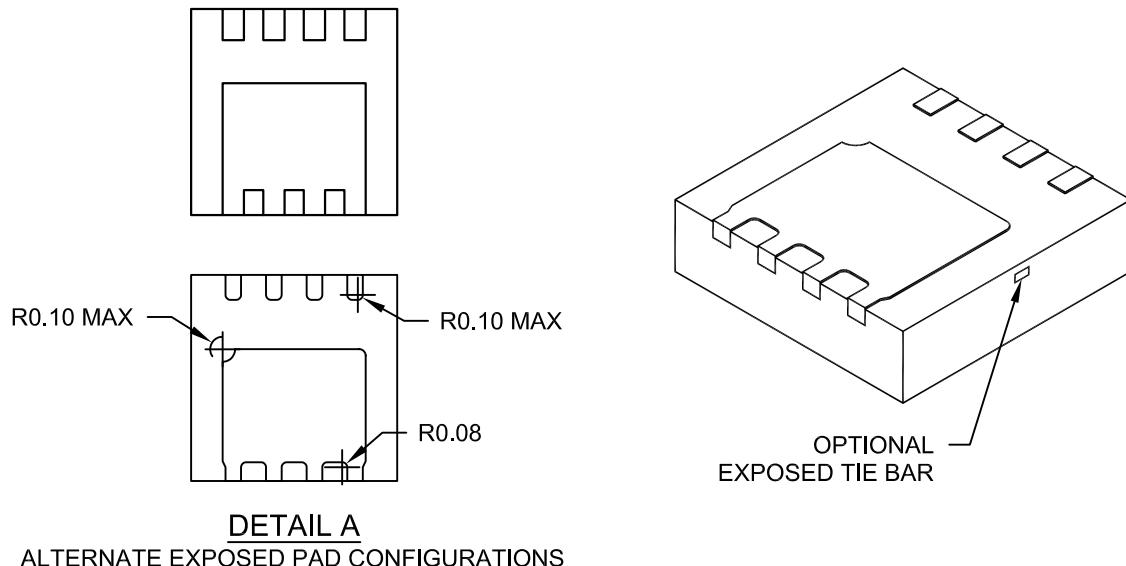
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

8-Lead Power Dual Flatpack No Lead Package (LC) – 3.3x3.3x1.0 mm Body [PDFN]

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



DETAIL A
ALTERNATE EXPOSED PAD CONFIGURATIONS

| Dimension | Limits | MILLIMETERS | | |
|-------------------------|--------|-------------|------|------|
| | | MIN | NOM | MAX |
| Number of Pins | N | 8 | | |
| Pitch | e | 0.65 | BSC | |
| Overall Height | A | 0.80 | 1.00 | 1.03 |
| Standoff | A1 | 0.00 | - | 0.05 |
| Terminal Thickness | (A3) | 0.20 REF | | |
| Overall Length | D | 3.30 BSC | | |
| Overall Width | E | 3.30 BSC | | |
| Exposed Pad length | D2 | 2.14 | 2.29 | 2.39 |
| Exposed Pad Width | E2 | 1.66 | 1.81 | 1.91 |
| Terminal Width | b | 0.25 | 0.30 | 0.35 |
| Terminal Length | L | 0.30 | 0.40 | 0.50 |
| Terminal Length | L2 | 0.30 | - | 0.40 |
| Terminal to Exposed Pad | K | 0.60 | - | - |

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.
3. Package is saw singulated.
4. Package dimension does not include mold flash, protrusions, burrs or metal smearing.
5. Dimensioning and tolerancing per ASME Y14.5M.

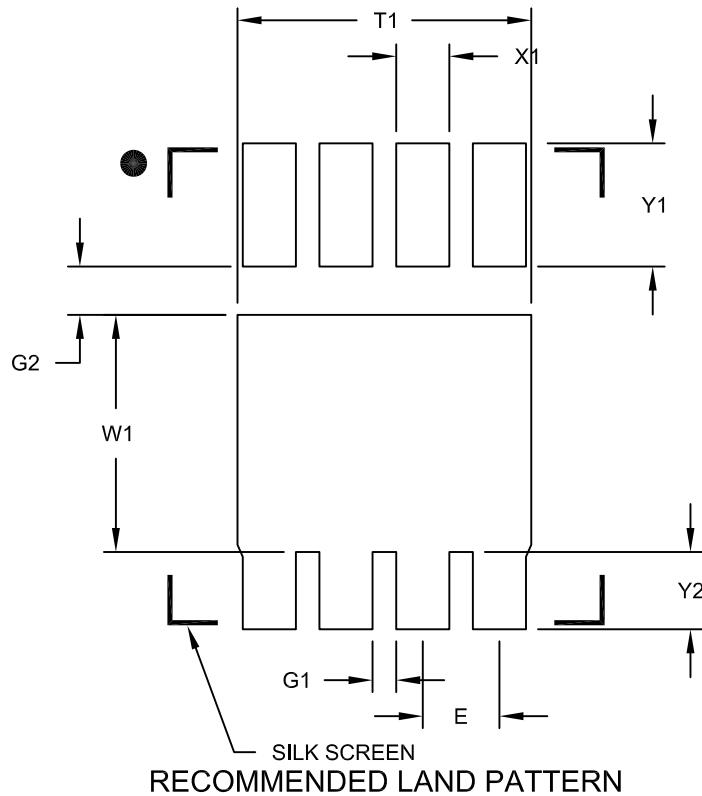
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

8-Lead Power Dual Flatpack No Lead Package (LC) – 3.3x3.3x1.0 mm Body [PDFN]

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 | | 0.65 BSC | | |
| Center Pad Width | W1 | | | 2.01 |
| Center Pad Length | T1 | | | 2.49 |
| Distance Between Terminals | G1 | 0.20 | | |
| Terminal Edge to Center Pad | G2 | 0.41 | | |
| Terminal Pad Width (X8) | X1 | | | 0.45 |
| Terminal Pad Length (X4) | Y1 | | | 1.05 |
| Terminal Pad Length (X8) | Y2 | | | 0.66 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2195A



MICROCHIP

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

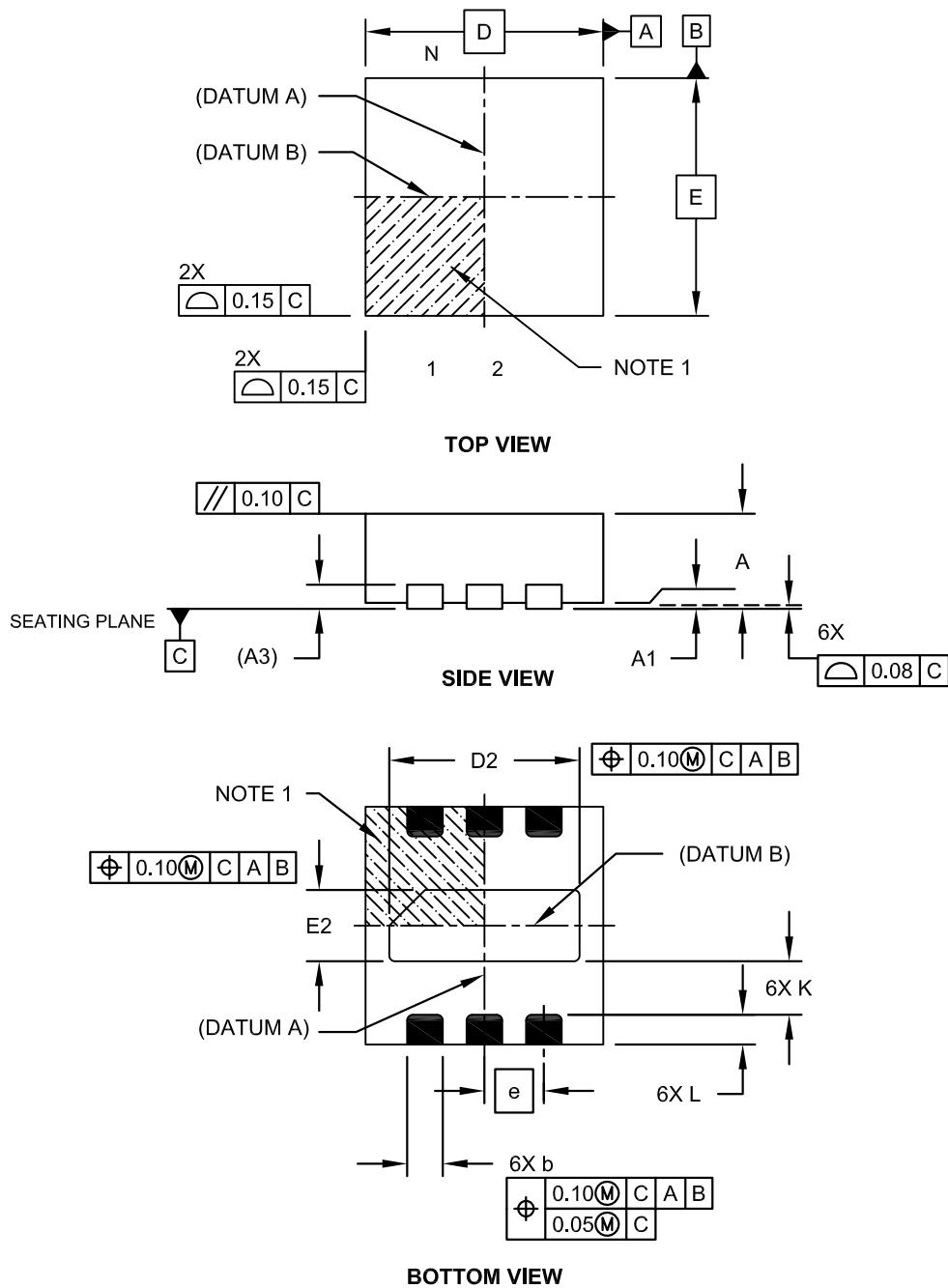
TDFN Family

Thin Dual Flat, No Lead Packages

Packaging Diagrams and Parameters

6-Lead Plastic Thin Dual Flat, No Lead Package (MY) – 2x2x0.8 mm Body [TDFN]

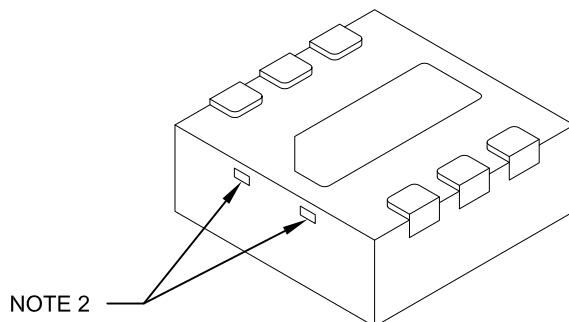
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

6-Lead Plastic Thin Dual Flat, No Lead Package (MY) – 2x2x0.8 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 | | 6 | | |
| 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 Width | E | | 2.00 | BSC | |
| Exposed Pad Width | E2 | 0.55 | 0.60 | 0.65 | |
| Overall Length | D | | 2.00 | BSC | |
| Exposed Pad Length | D2 | 1.55 | 1.60 | 1.65 | |
| Contact Width | b | 0.25 | 0.30 | 0.35 | |
| Contact Length | L | 0.20 | 0.25 | 0.30 | |
| 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.

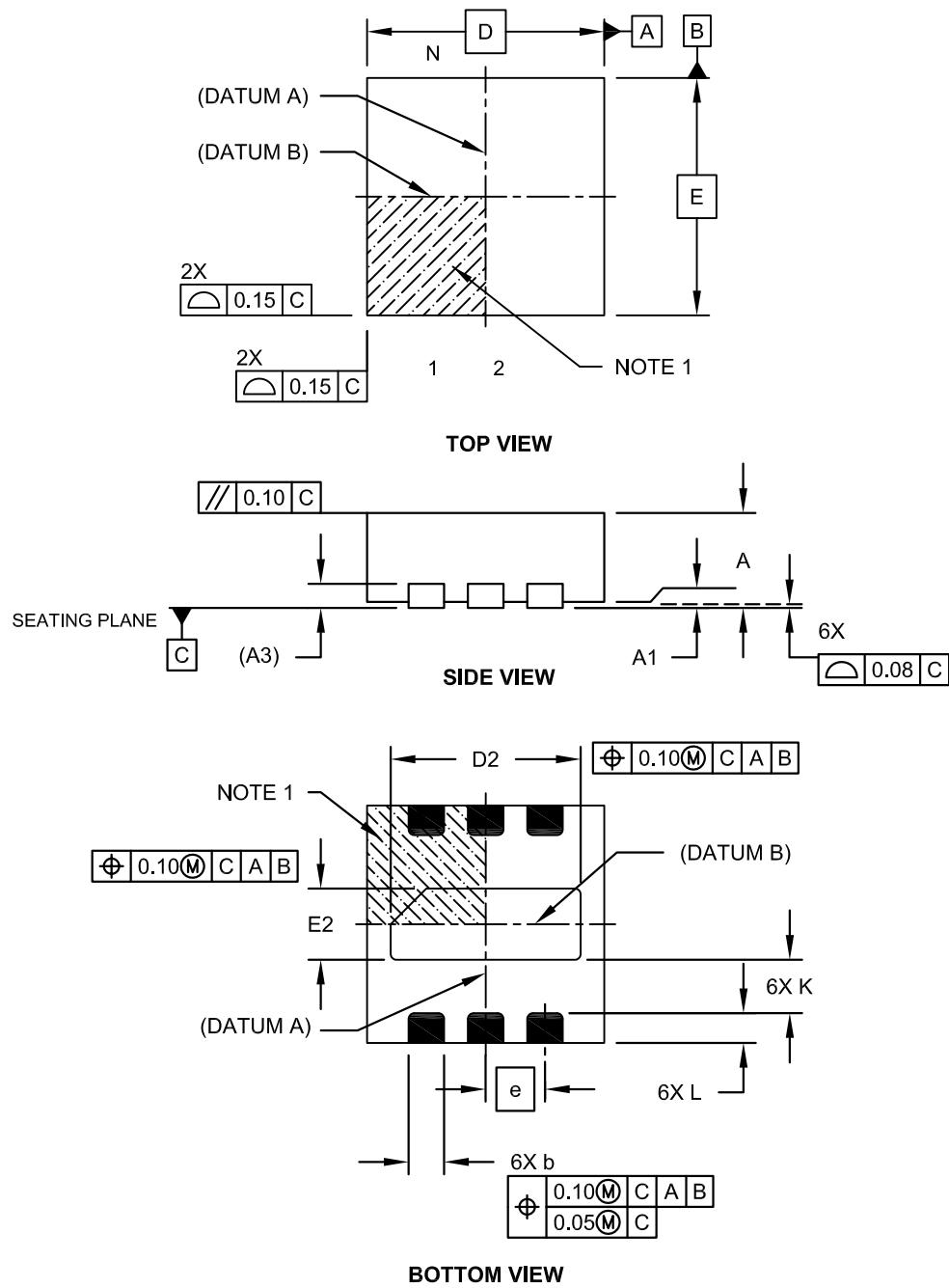
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

6-Lead Plastic Thin Dual Flat, No Lead Package (MYY) – 2x2x0.8 mm Body [TDFN]

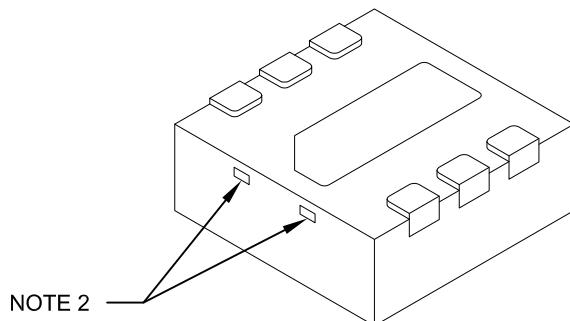
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

6-Lead Plastic Thin Dual Flat, No Lead Package (MYY) – 2x2x0.8 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 | | 6 | | |
| Pitch | e | | 0.50 | 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 | 0.20 | REF | |
| Overall Width | E | 2.00 | 2.00 | BSC | |
| Exposed Pad Width | E2 | 0.55 | 0.60 | 0.65 | |
| Overall Length | D | 2.00 | 2.00 | BSC | |
| Exposed Pad Length | D2 | 1.55 | 1.60 | 1.65 | |
| Contact Width | b | 0.25 | 0.30 | 0.35 | |
| Contact Length | L | 0.20 | 0.25 | 0.30 | |
| 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.

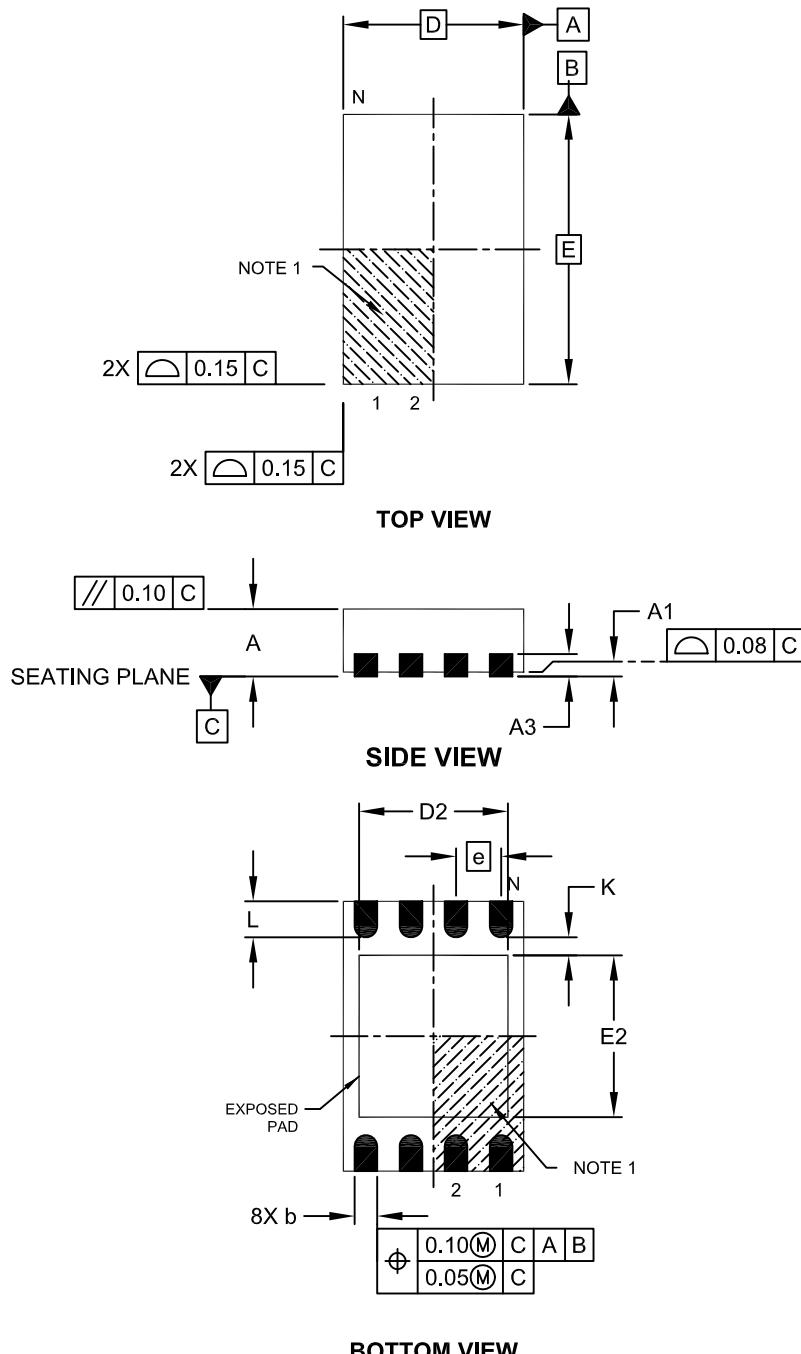
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

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

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

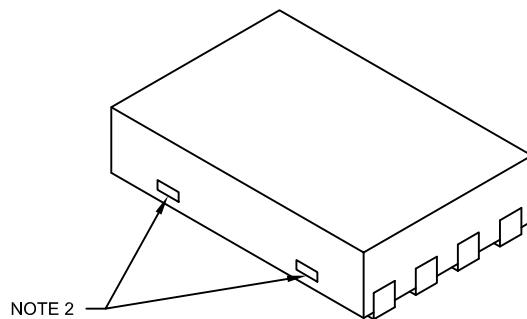


Microchip Technology Drawing No. C04-129C Sheet 1 of 2

Packaging Diagrams and Parameters

8-Lead Plastic Dual Flat, No Lead Package (MN) – 2x3x0.75mm 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 | | - - |

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

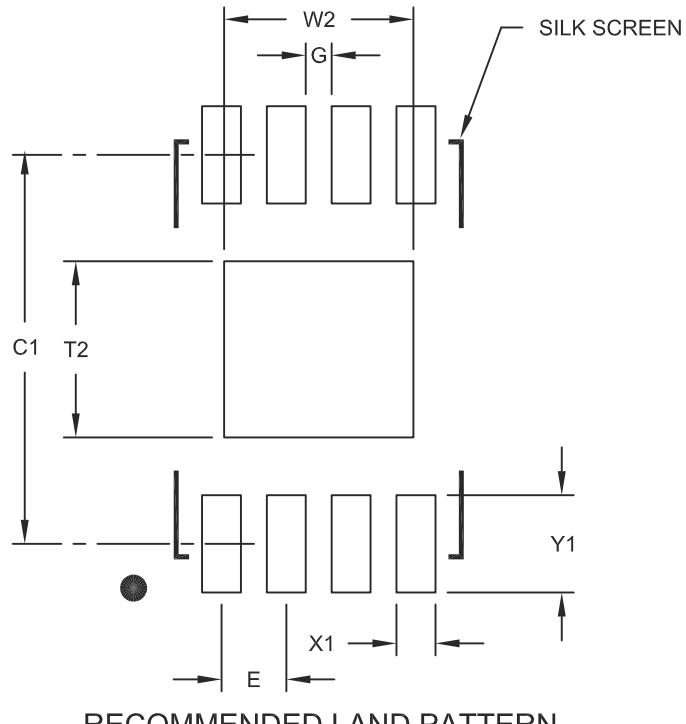
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

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

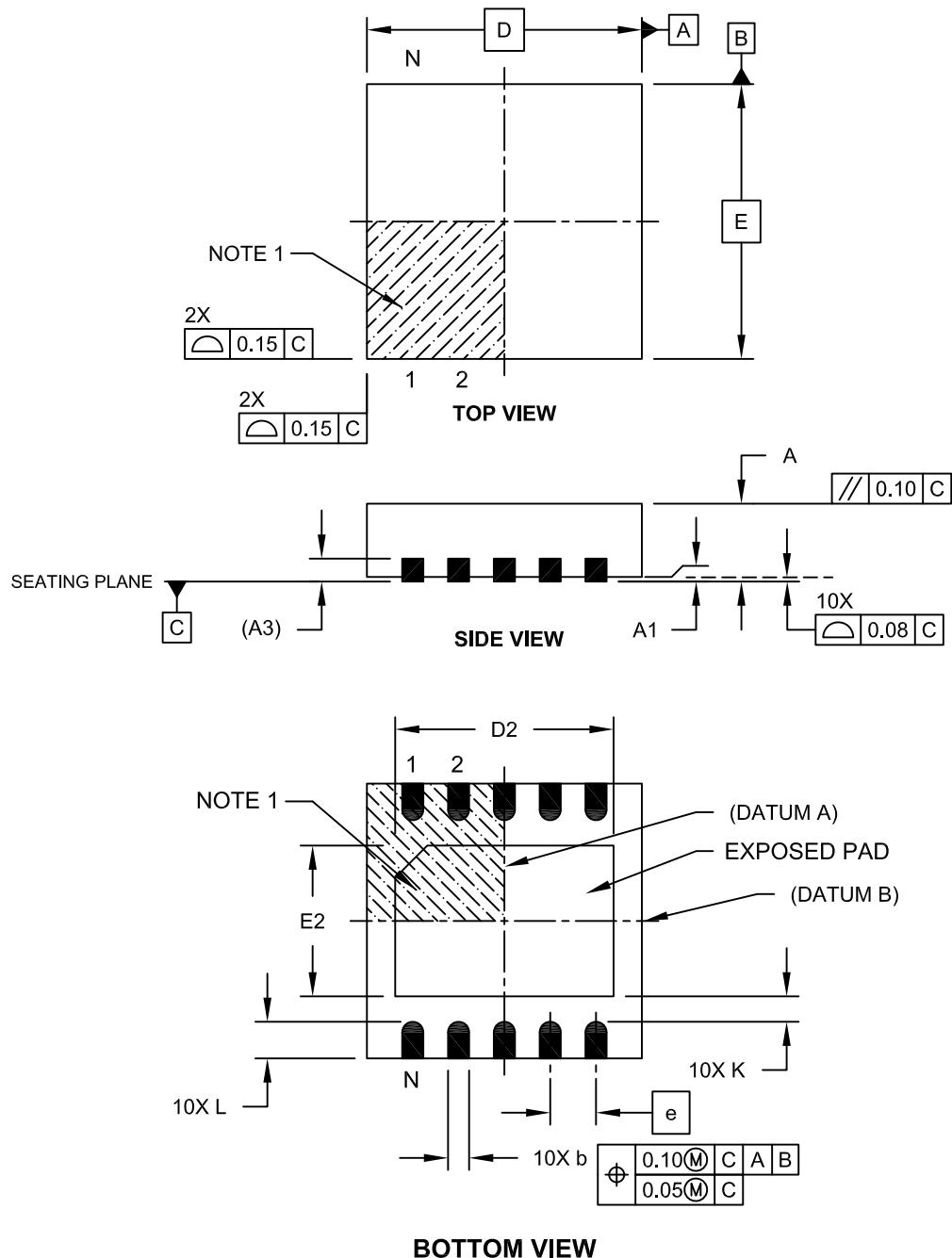
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2129A

Packaging Diagrams and Parameters

10-Lead Thin Plastic Dual Flat, No Lead Package (MN) - 3x3x0.8mm Body [TDFN]

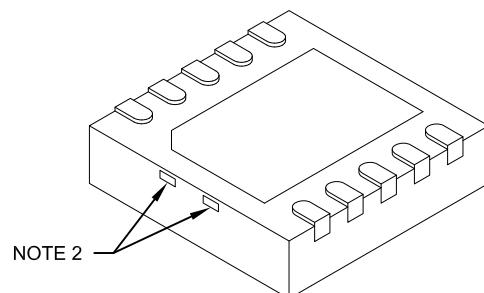
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

10-Lead Thin Plastic Dual Flat, No Lead Package (MN) - 3x3x0.8mm 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 | | | | 10 | | |
| 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 | 3.00 BSC | | | | | |
| Exposed Pad Length | D2 | 2.20 | 2.30 | 2.35 | | | |
| Overall Width | E | 3.00 BSC | | | | | |
| Exposed Pad Width | E2 | 1.55 | 1.65 | 1.70 | | | |
| 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 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

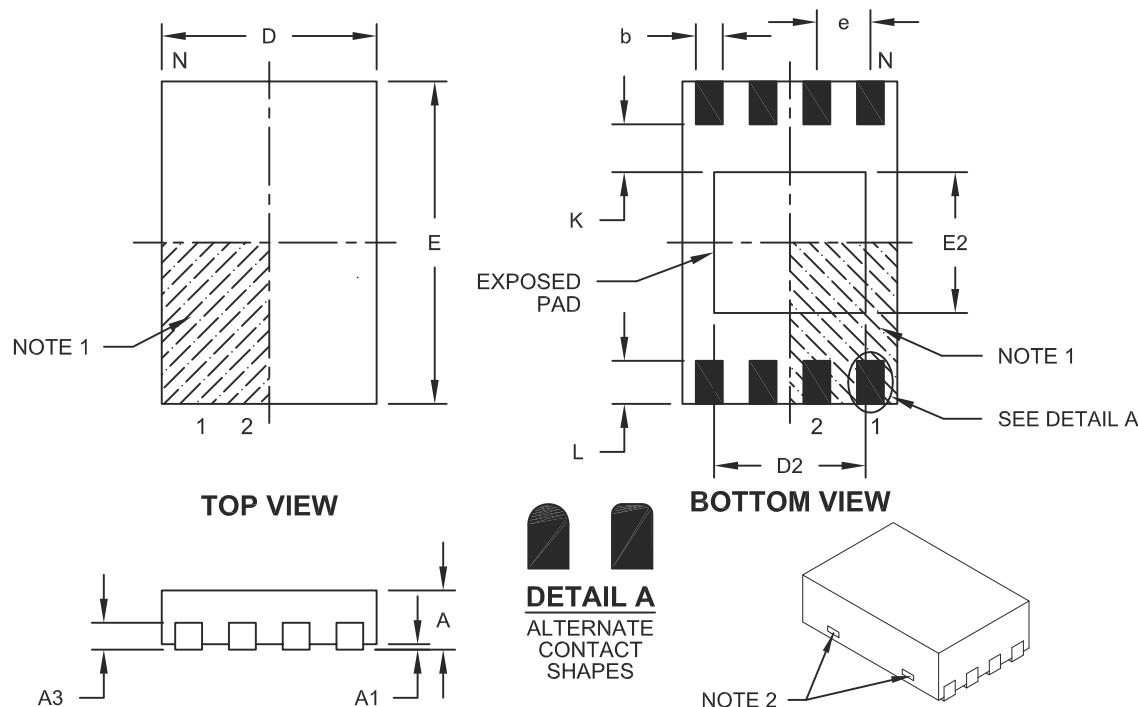
UDFN Family

Ultra Thin Dual Flat, No Lead Packages

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>



| Dimension | Units | MILLIMETERS | | |
|------------------------|-------|-------------|----------|------|
| | | 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.

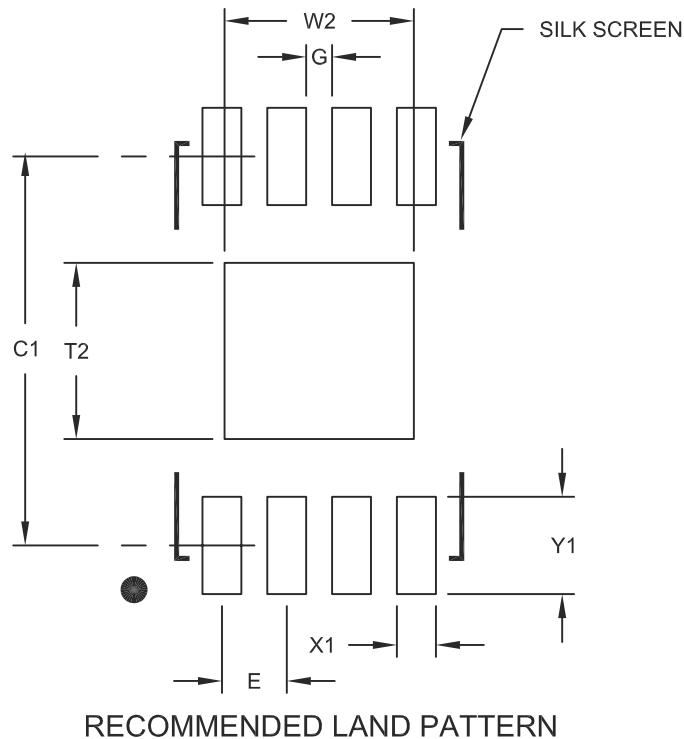
REF: Reference Dimension, usually without tolerance, for information purposes only.

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

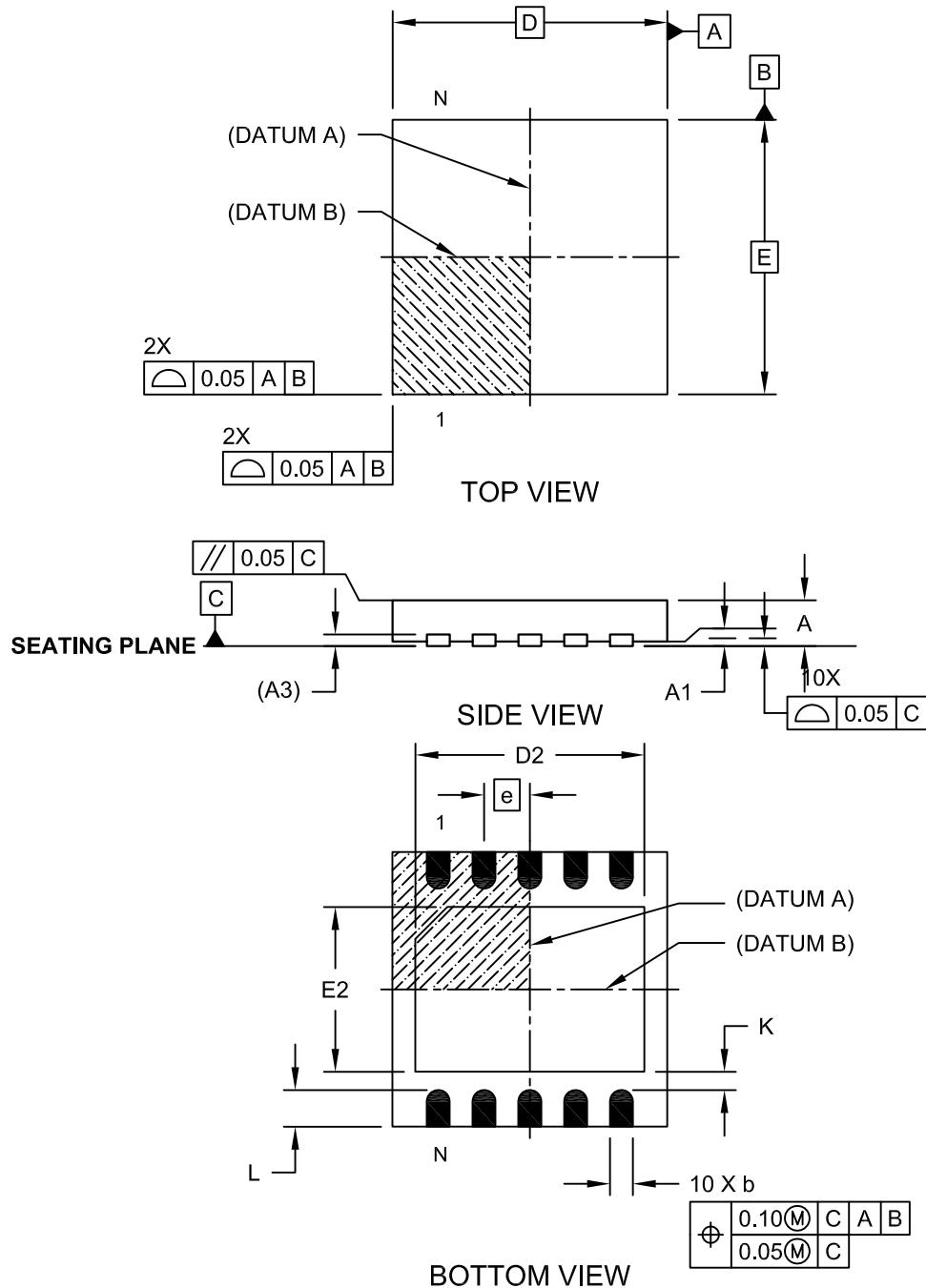
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2136A

Packaging Diagrams and Parameters

10-Lead Ultra-thin Dual Flatpack No-Lead (NA[Y]) – 3x3x0.5 mm Body [UDFN]

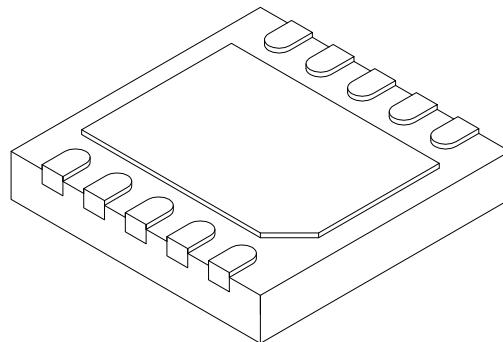
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

10-Lead Ultra-thin Dual Flatpack No-Lead (NA[Y]) – 3x3x0.5 mm Body [UDFN]

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



| Dimension | Units | MILLIMETERS | | |
|-------------------------|-------|-------------|-----------|------|
| | | MIN | NOM | MAX |
| Number of Pins | N | | 10 | |
| Pitch | e | | 0.50 BSC | |
| Overall Height | A | 0.45 | 0.50 | 0.55 |
| Standoff | A1 | 0.00 | - | 0.05 |
| Overall Length | D | | 3.00 BSC | |
| Overall Width | E | | 3.00 BSC | |
| Exposed Pad Length | D2 | 2.40 | 2.50 | 2.60 |
| Exposed Pad Width | E2 | 1.70 | 1.80 | 1.90 |
| Terminal Thickness | (A3) | | 0.127 REF | |
| Terminal Width | b | 0.20 | 0.25 | 0.30 |
| Terminal Length | L | 0.30 | 0.40 | 0.50 |
| Terminal-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.
2. 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

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

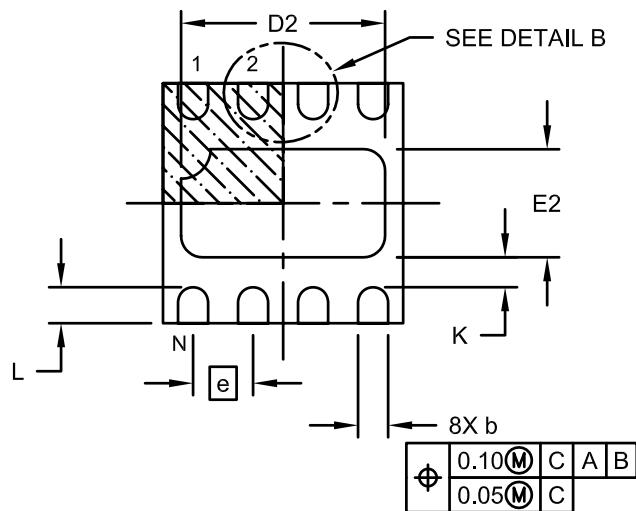
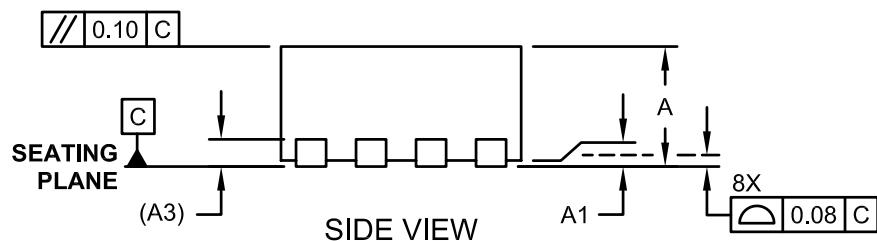
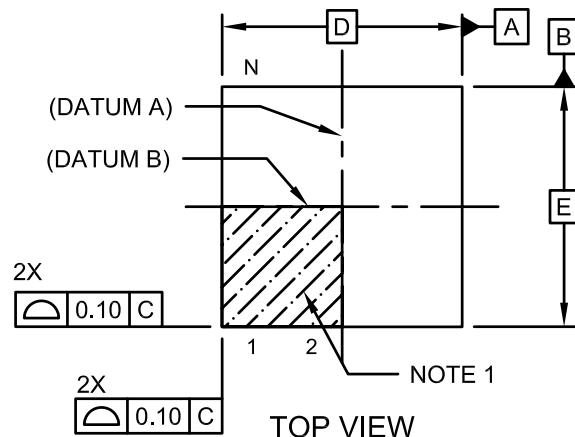
VDFN Family

Very Thin Dual Flat, No Lead Packages

Packaging Diagrams and Parameters

8-Lead Very Thin Dual Flatpack No-Lead (LZ) – 2x2x0.9 mm Body [VDFN]

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

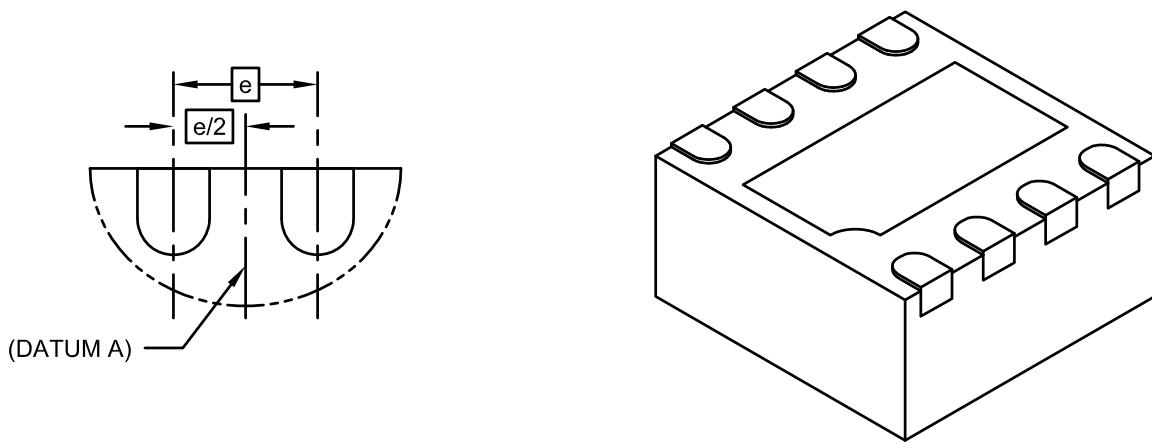


BOTTOM VIEW

Packaging Diagrams and Parameters

8-Lead Very Thin Dual Flatpack No-Lead (LZ) – 2x2x0.9 mm Body [VDFN]

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



DETAIL B

| Dimension | Limits | Units MILLIMETERS | | |
|--------------------------|--------|-------------------|-------|------|
| | | 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 |
| Terminal Thickness (REF) | (A3) | 0.20 | (REF) | |
| Overall Width | D | 2.00 | BSC | |
| Exposed Pad Width | D2 | 1.55 | 1.70 | 1.80 |
| Overall Length | E | 2.00 | BSC | |
| Exposed Pad Length | E2 | 0.75 | 0.90 | 1.00 |
| Terminal Width | b | 0.18 | 0.25 | 0.30 |
| Terminal Length | L | 0.20 | 0.30 | 0.40 |
| Terminal-to-Exposed Pad | K | 0.20 | - | - |

Notes:

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

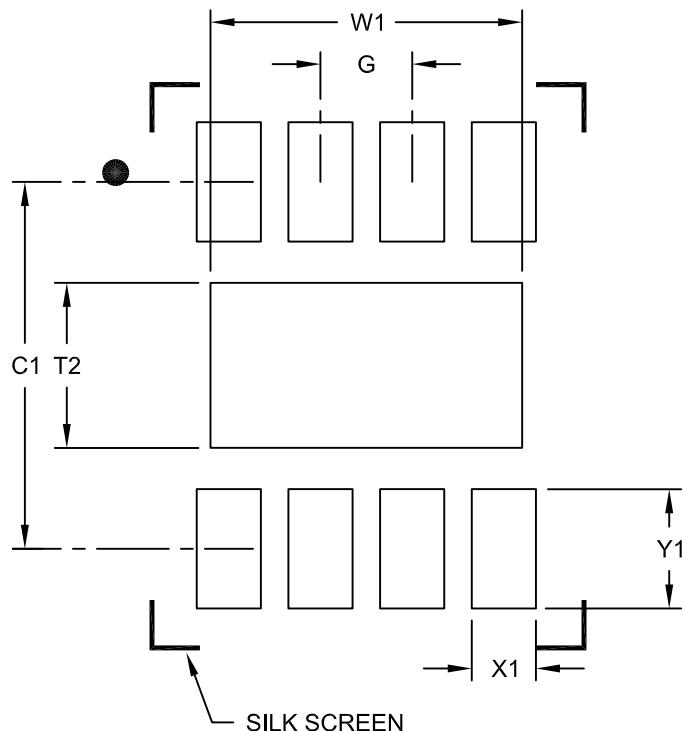
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

**8-Lead Plastic Very Thin Flat, No Lead Package (LZ) - 2x2 mm Body [VDFN]
With 0.55mm 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 | W1 | | | 1.70 |
| Optional Center Pad Length | T2 | | | 0.90 |
| Contact Pad Spacing | C1 | | 2.00 | |
| Contact Pad Width (X28) | X1 | | | 0.35 |
| Contact Pad Length (X28) | Y1 | | | 0.65 |
| Distance Between Pads | G | 0.15 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2198A

Packaging Diagrams and Parameters

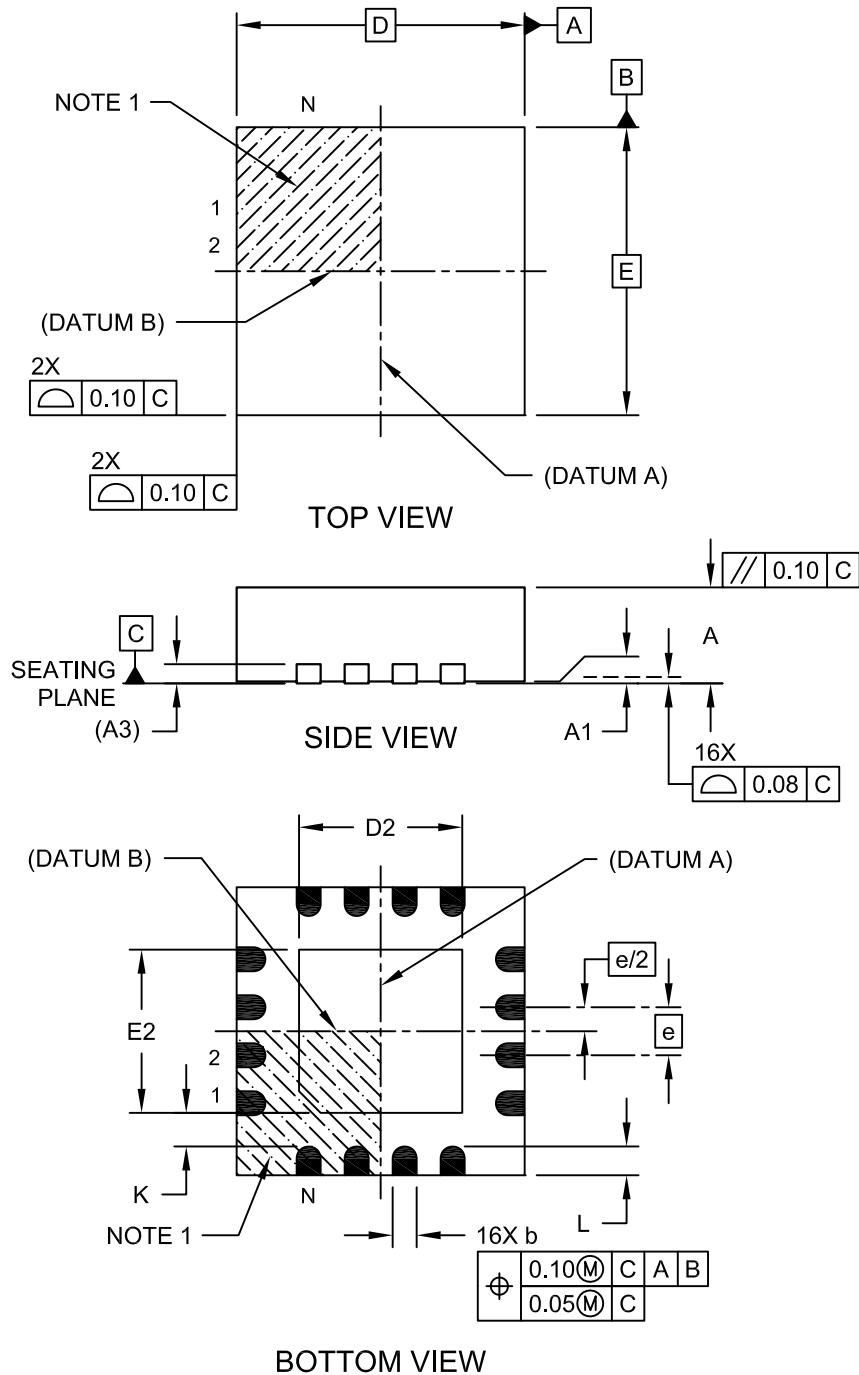
QFN Family

Quad Flat, No Lead Package

Packaging Diagrams and Parameters

16-Lead Plastic Quad Flat, No Lead Package (NG) - 3x3x0.9 mm Body [QFN]

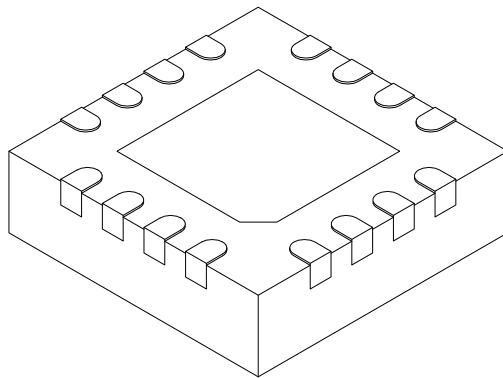
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

16-Lead Plastic Quad Flat, No Lead Package (NG) - 3x3x0.9 mm Body [QFN]

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 | | 16 | |
| Pitch | e | | 0.50 BSC | |
| Overall Height | A | 0.80 | 0.90 | 1.00 |
| Standoff | A1 | 0.00 | 0.02 | 0.05 |
| Terminal Thickness | A3 | | 0.20 REF | |
| Overall Width | E | | 3.00 BSC | |
| Exposed Pad Width | E2 | 1.55 | 1.70 | 1.80 |
| Overall Length | D | | 3.00 BSC | |
| Exposed Pad Length | D2 | 1.55 | 1.70 | 1.80 |
| Terminal Width | b | 0.18 | 0.25 | 0.30 |
| Terminal Length | L | 0.20 | 0.30 | 0.40 |
| Terminal-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.

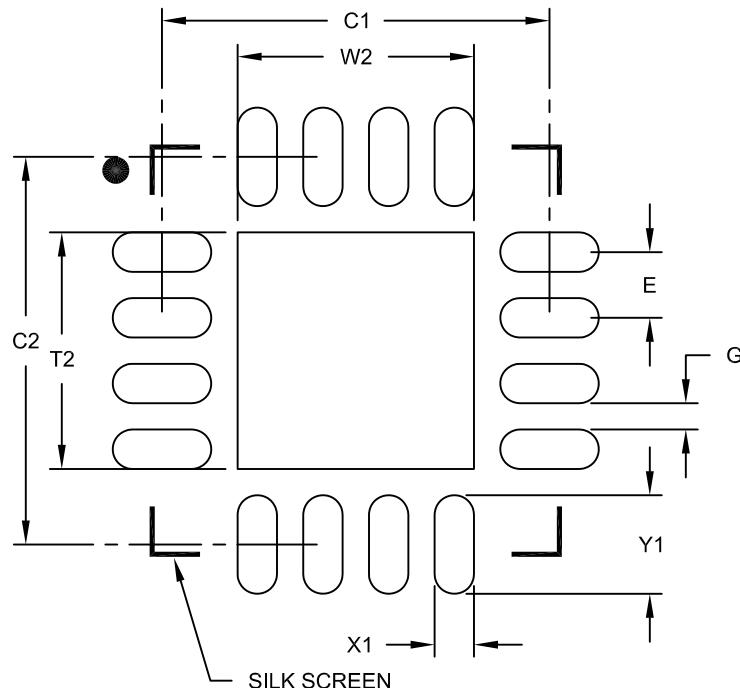
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

16-Lead Plastic Quad Flat, No Lead Package (NG) – 3x3x0.9 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 |
| Contact Pitch | E | | 0.50 | BSC | |
| Optional Center Pad Width | W2 | | | | 1.80 |
| Optional Center Pad Length | T2 | | | | 1.80 |
| Contact Pad Spacing | C1 | | 2.95 | | |
| Contact Pad Spacing | C2 | | 2.95 | | |
| Contact Pad Width (X16) | X1 | | | | 0.30 |
| Contact Pad Length (X16) | Y1 | | | | 0.75 |
| Distance Between Pads | G | 0.20 | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

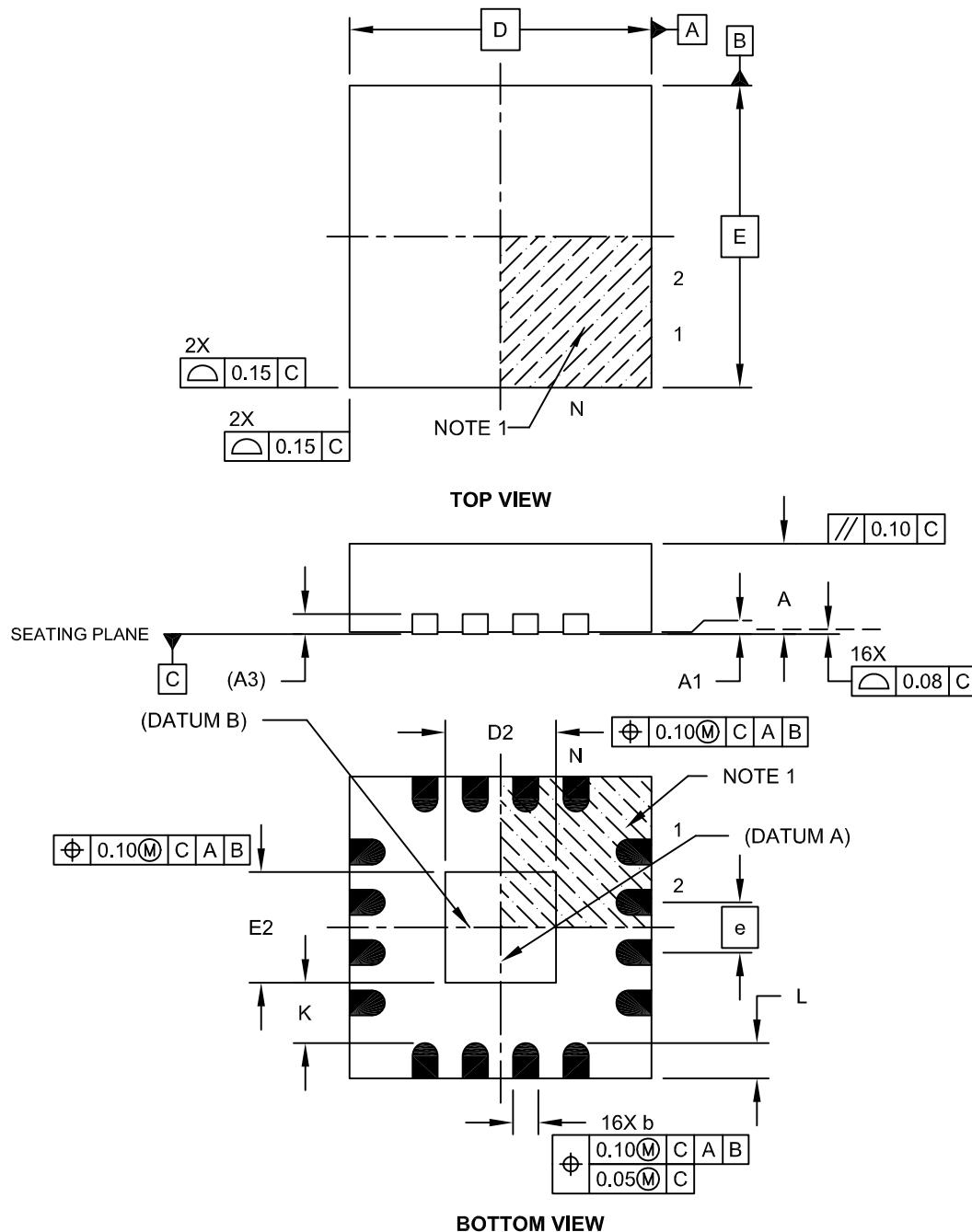
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2197A

Packaging Diagrams and Parameters

16-Lead Plastic Quad Flat, No Lead Package (MG) - 3x3x0.9 mm Body [QFN]

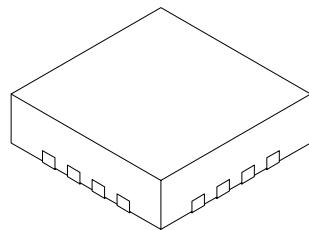
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

16-Lead Plastic Quad Flat, No Lead Package (MG) - 3x3x0.9 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 | | | | 0.50 | 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 | | | 3.00 | BSC | | |
| Exposed Pad Width | E2 | 1.00 | | 1.10 | | 1.50 | |
| Overall Length | D | | | 3.00 | BSC | | |
| Exposed Pad Length | D2 | 1.00 | | 1.10 | | 1.50 | |
| Contact Width | b | 0.18 | | 0.25 | | 0.30 | |
| Contact Length | L | 0.25 | | 0.35 | | 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.

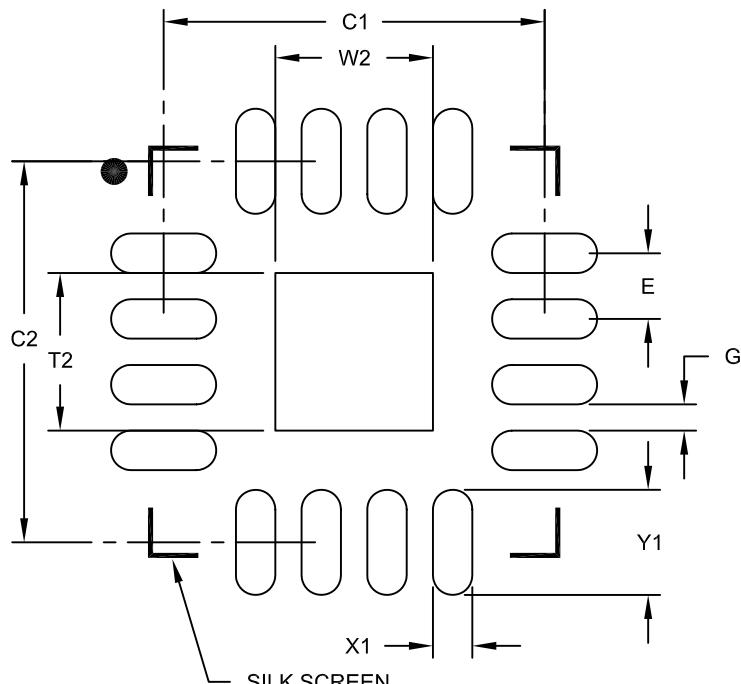
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

16-Lead Plastic Quad Flat, No Lead Package (MG) – 3x3x0.9 mm Body [QFN]

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 | | | 1.20 | | |
| Optional Center Pad Length | | T2 | | | 1.20 | | |
| Contact Pad Spacing | | C1 | | | 2.90 | | |
| Contact Pad Spacing | | C2 | | | 2.90 | | |
| Contact Pad Width (X16) | | X1 | | | 0.30 | | |
| Contact Pad Length (X16) | | Y1 | | | 0.80 | | |
| Distance Between Pads | | G | | | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

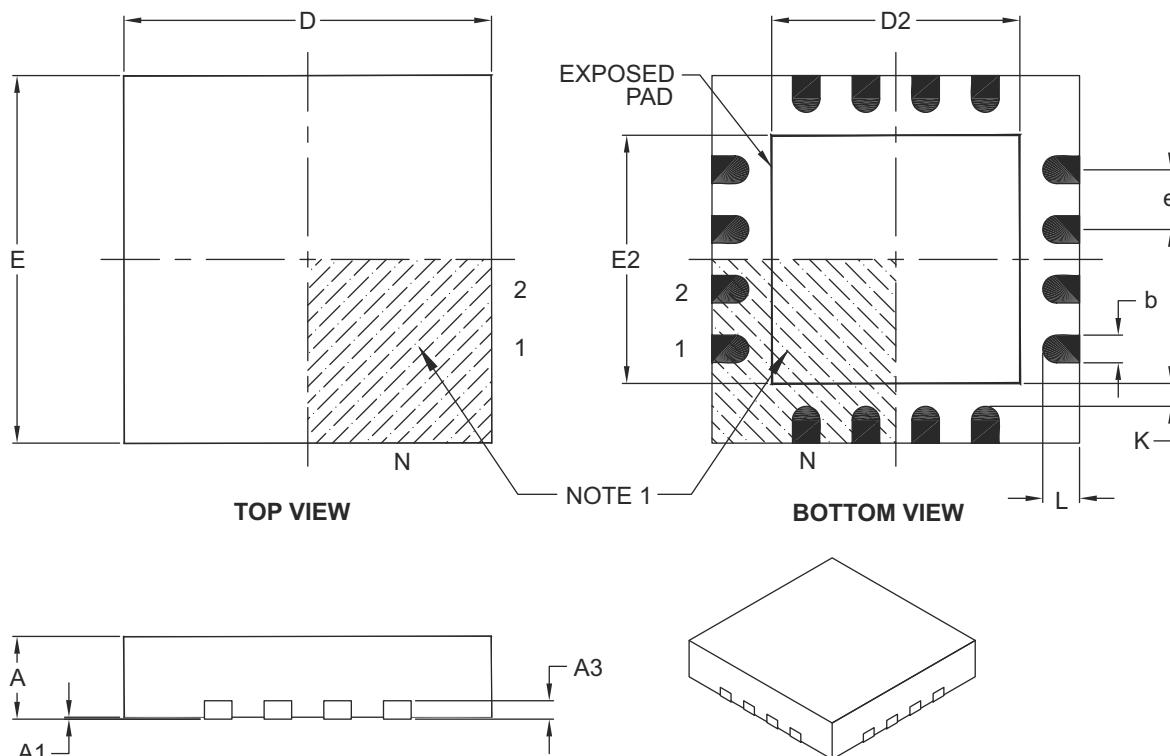
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2142A

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.

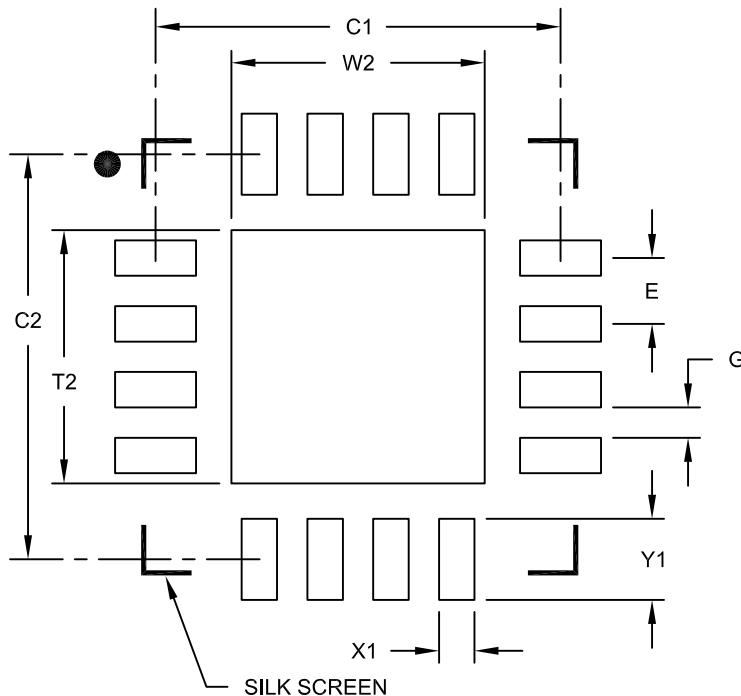
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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

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 (X16) | X1 | | | 0.35 |
| Contact Pad Length (X16) | Y1 | | | 0.80 |
| Distance Between Pads | G | 0.30 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

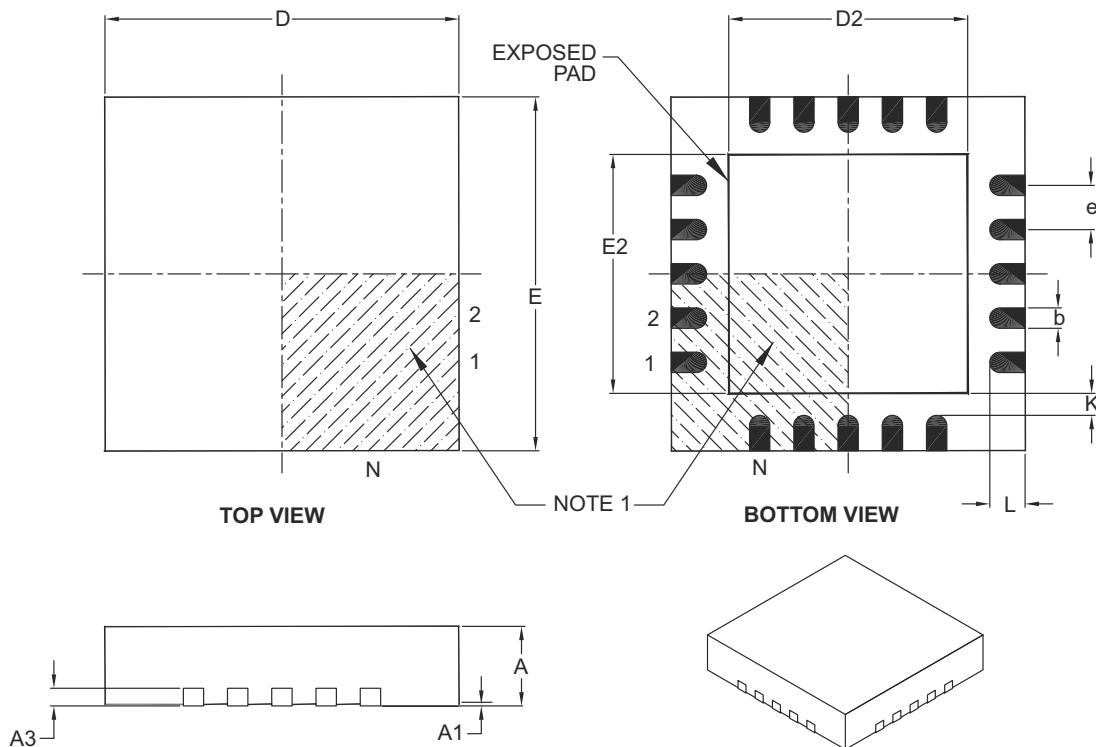
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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.

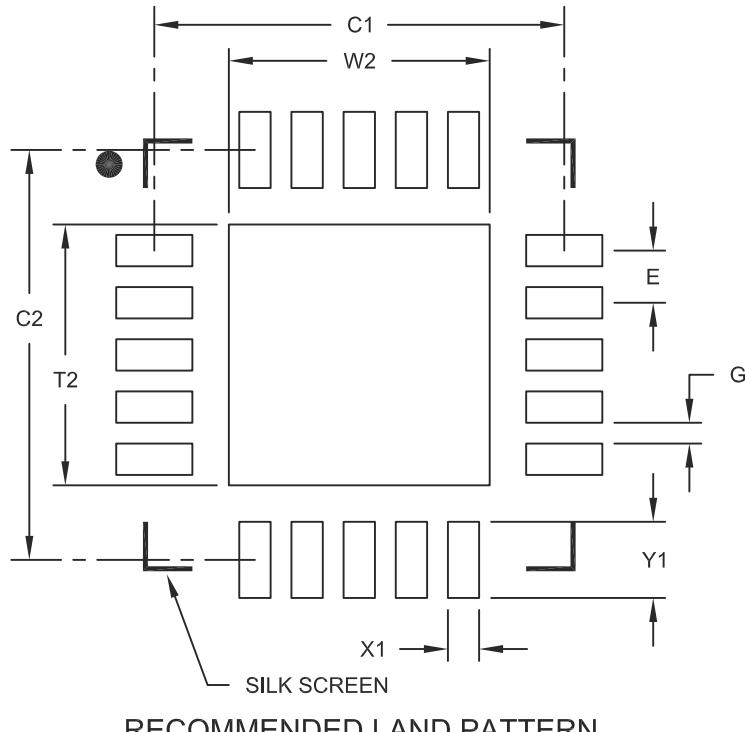
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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]
 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 |
| 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

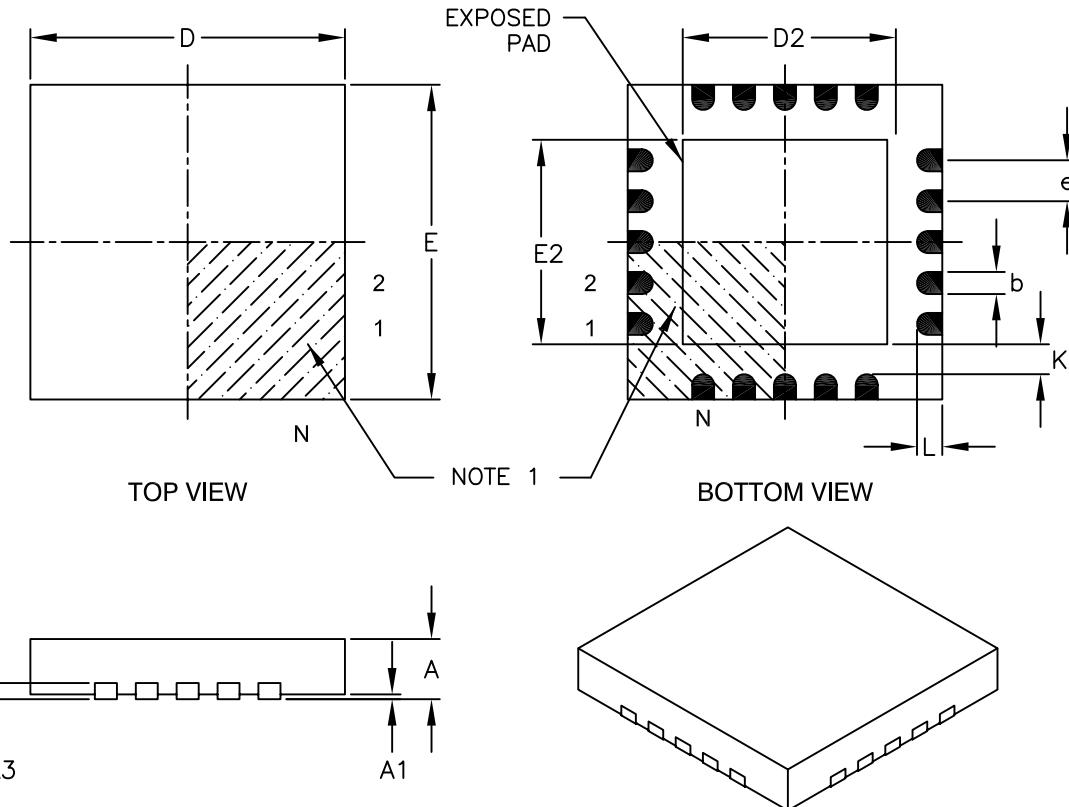
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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.

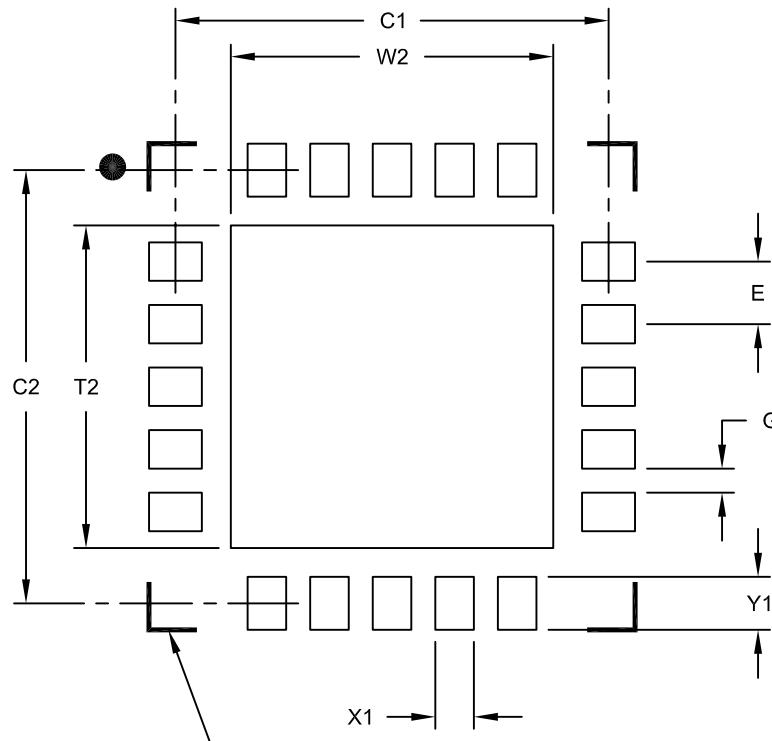
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

20-Lead Plastic Quad Flat, No Lead Package (MQ) - 5x5 mm Body [QFN]
With 0.40mm 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 | | 0.65 BSC | | |
| Optional Center Pad Width | W2 | | | 3.35 |
| Optional Center Pad Length | T2 | | | 3.35 |
| Contact Pad Spacing | C1 | | 4.50 | |
| Contact Pad Spacing | C2 | | 4.50 | |
| Contact Pad Width (X20) | X1 | | | 0.40 |
| Contact Pad Length (X20) | Y1 | | | 0.55 |
| Distance Between Pads | G | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

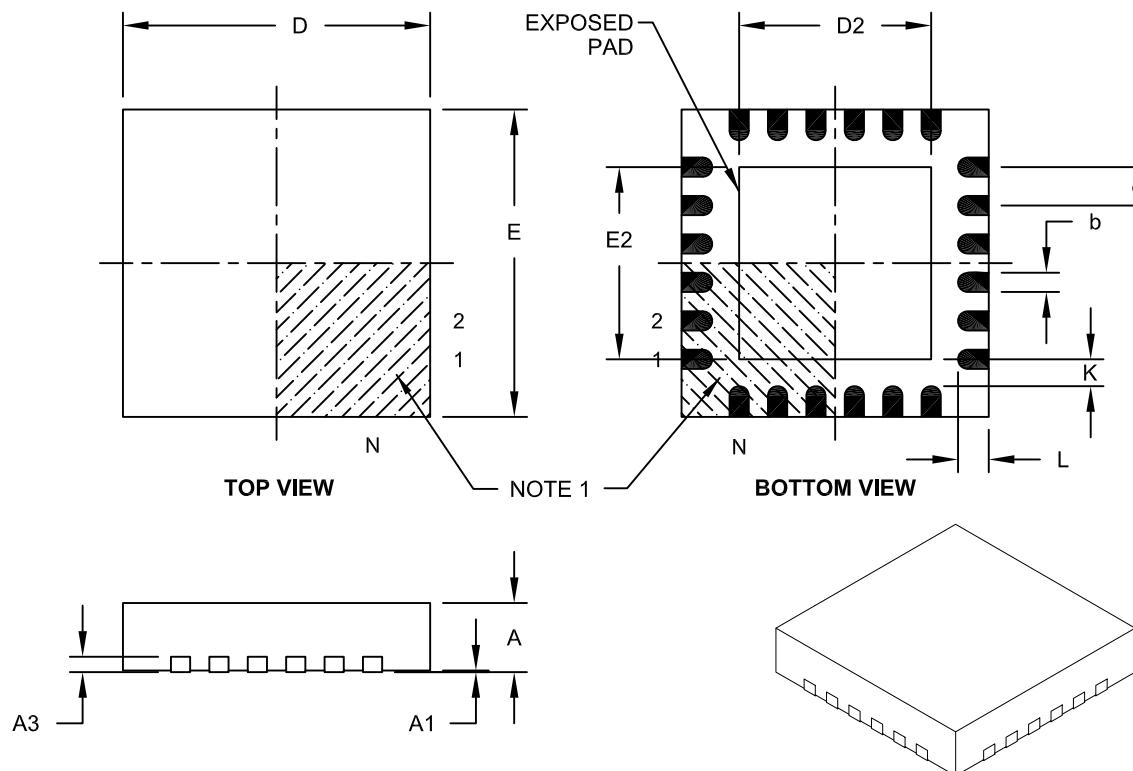
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2139A

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.

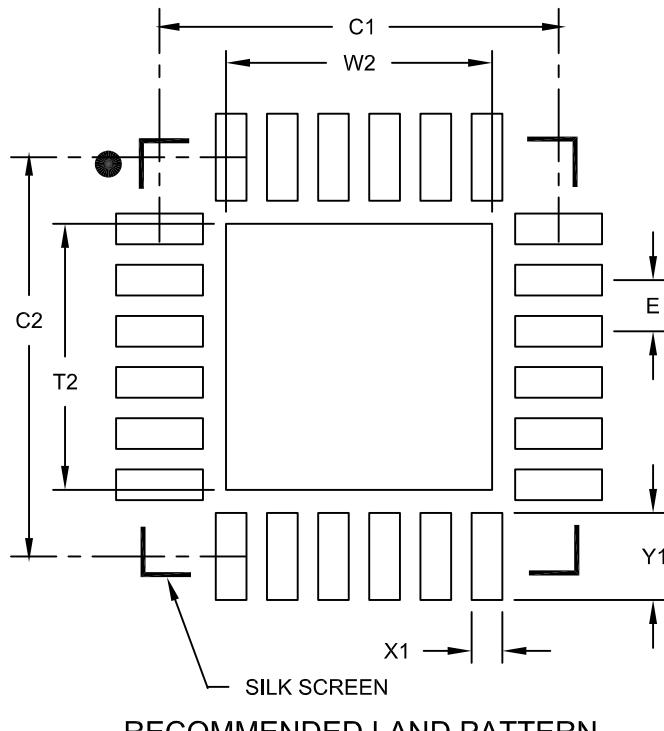
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

24-Lead Plastic Quad Flat, No Lead Package (MJ) - 4x4 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 | | | 0.50 | 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

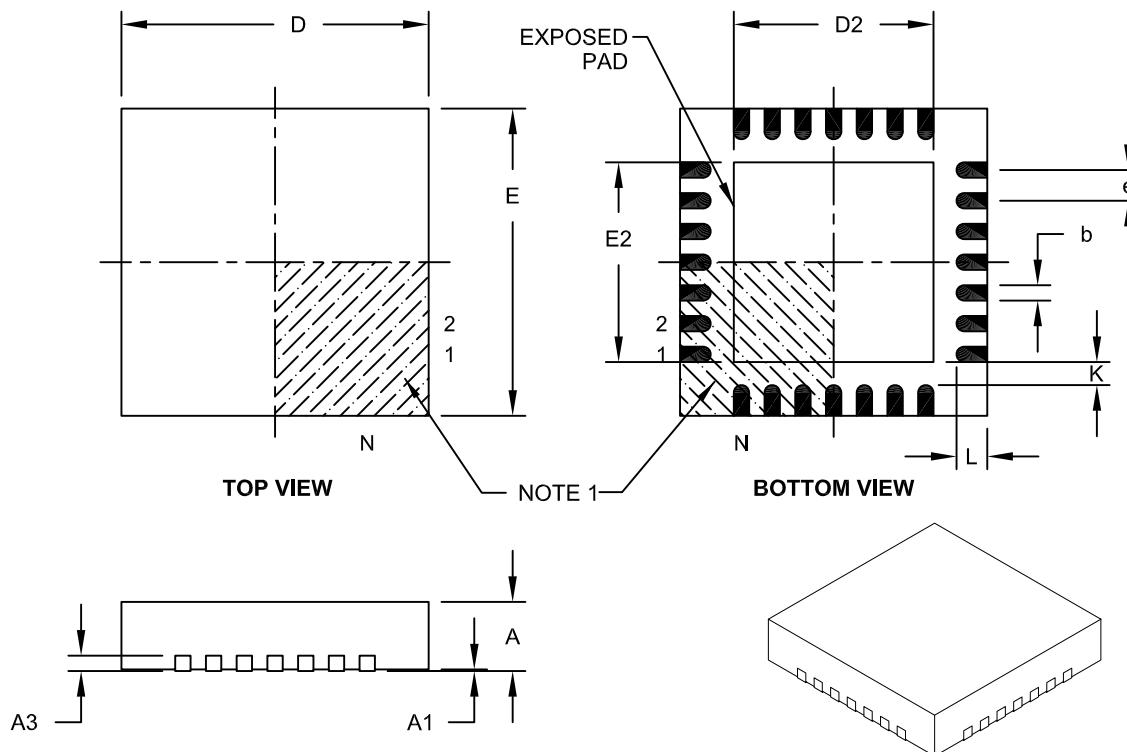
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2143B

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.

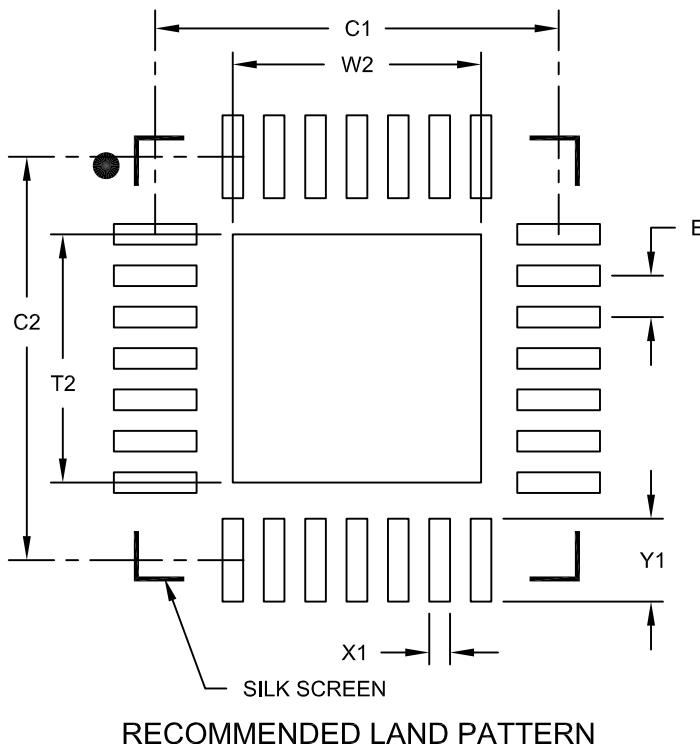
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-144A

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>



| | | 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

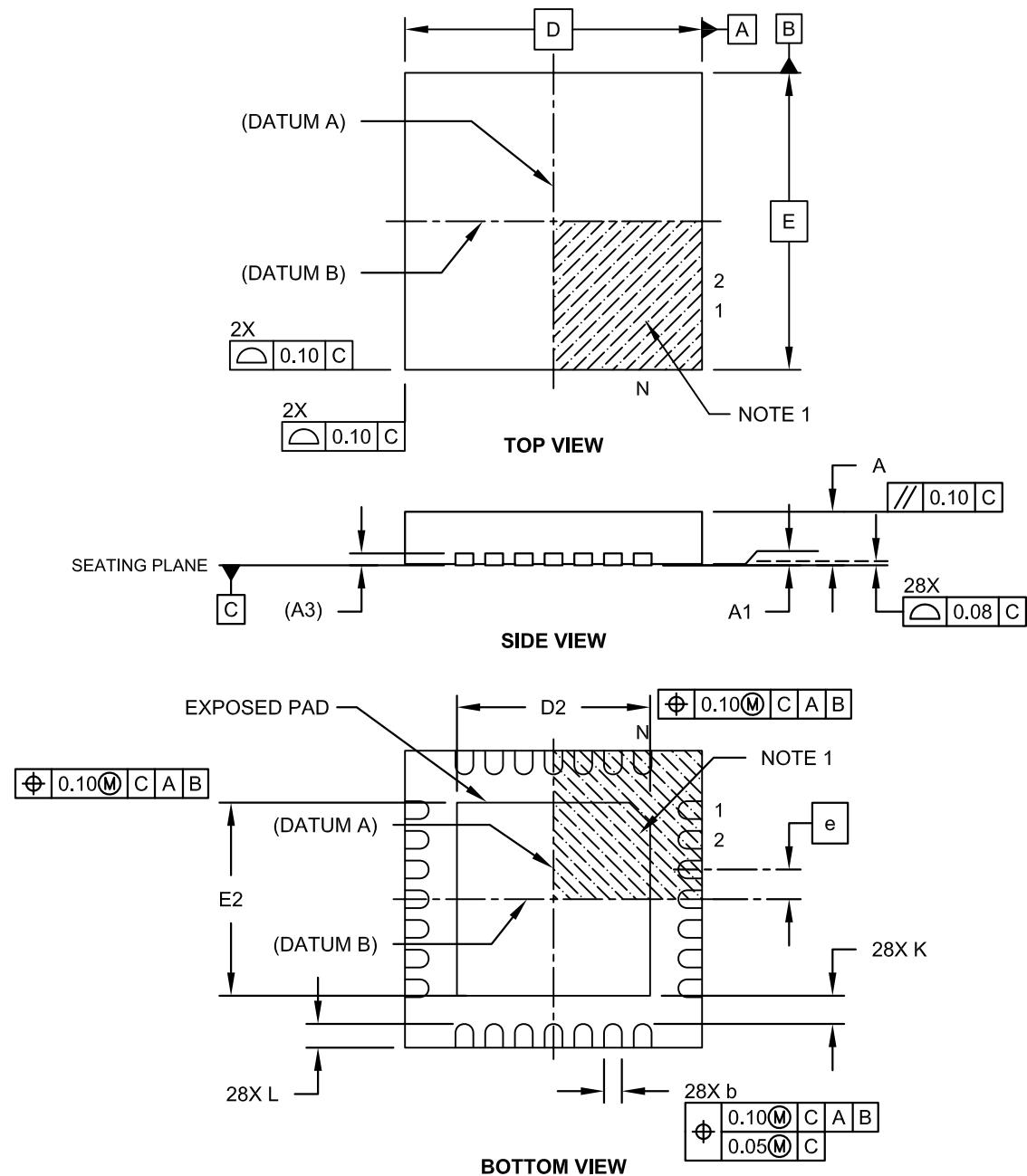
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2144A

Packaging Diagrams and Parameters

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

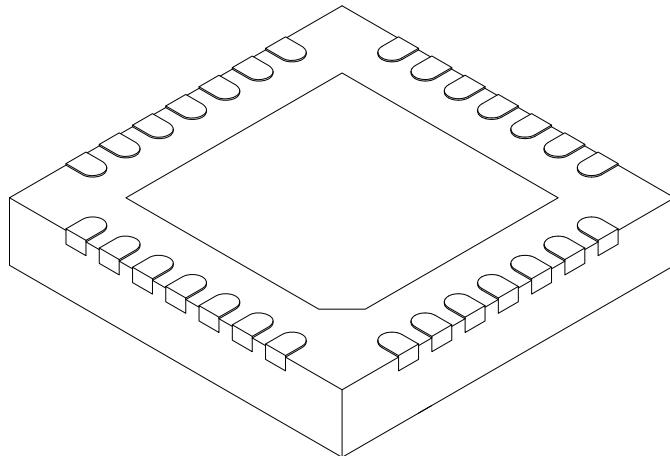
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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.

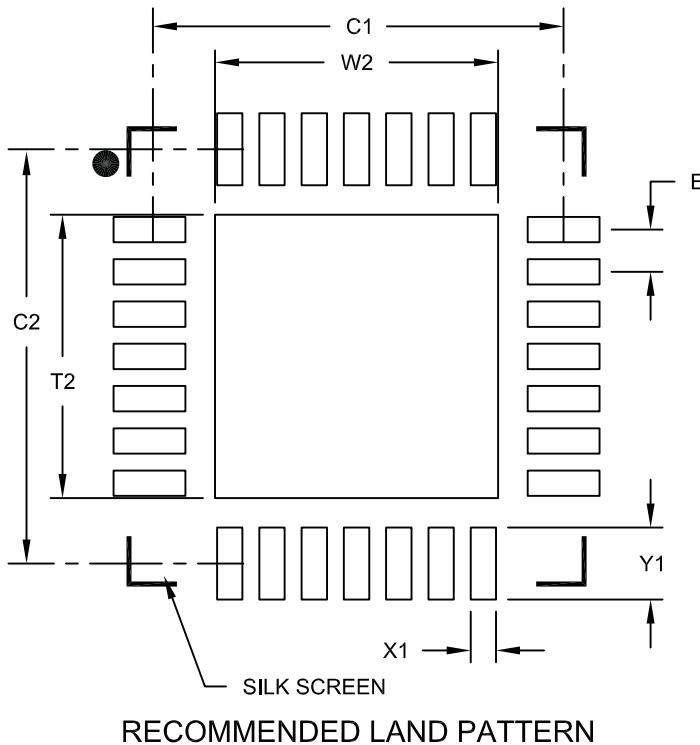
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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>



| Dimension Limits | | MILLIMETERS | | |
|----------------------------|----|-------------|------|------|
| | | 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

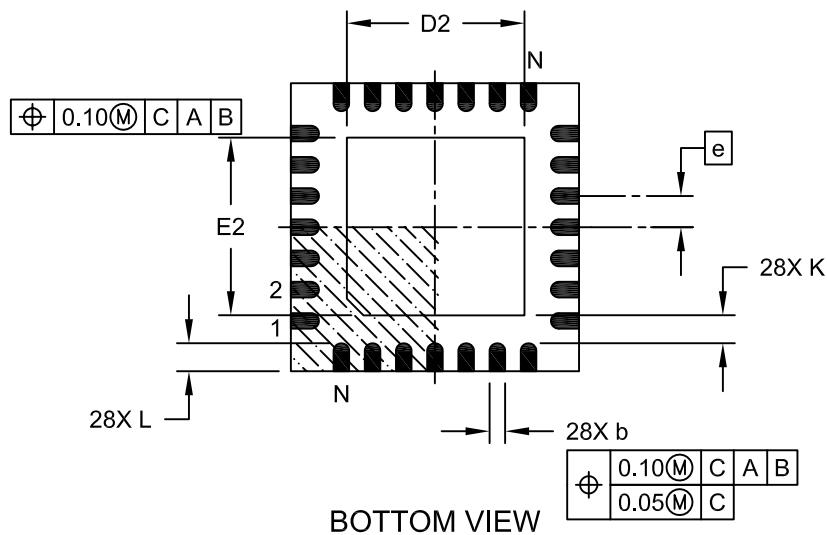
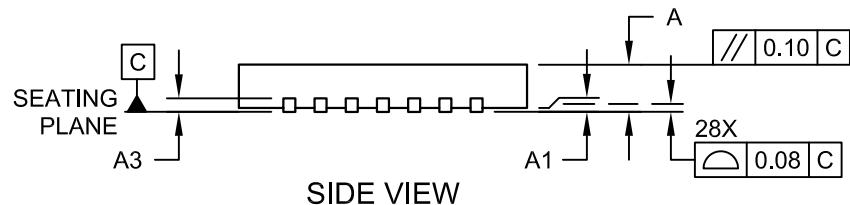
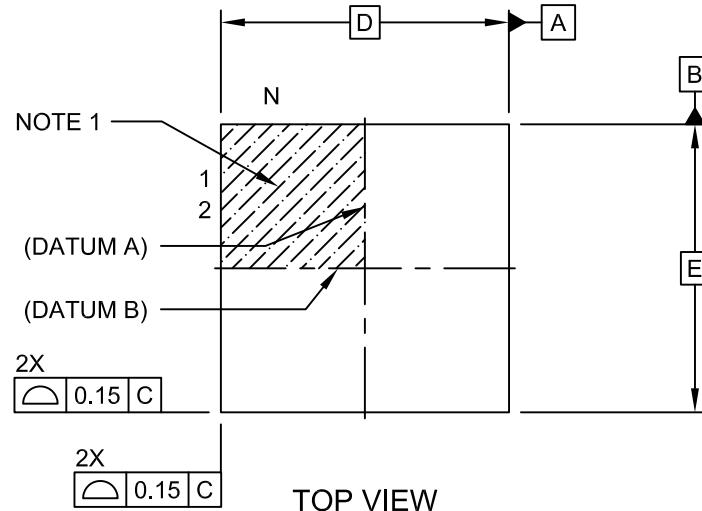
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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 Terminal Length

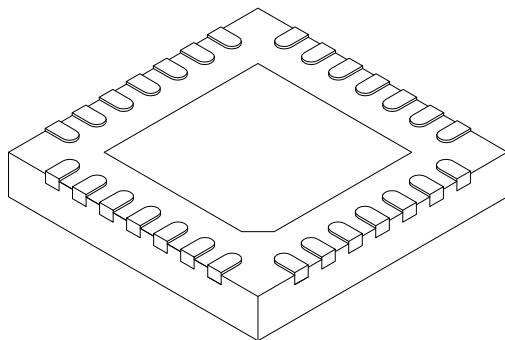
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

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

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



| Dimension | Units | MILLIMETERS | | |
|-------------------------|-------|-------------|------|------|
| | | 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 |
| Terminal 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 |
| Terminal Width | b | 0.23 | 0.30 | 0.35 |
| Terminal Length | L | 0.50 | 0.55 | 0.70 |
| Terminal-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.

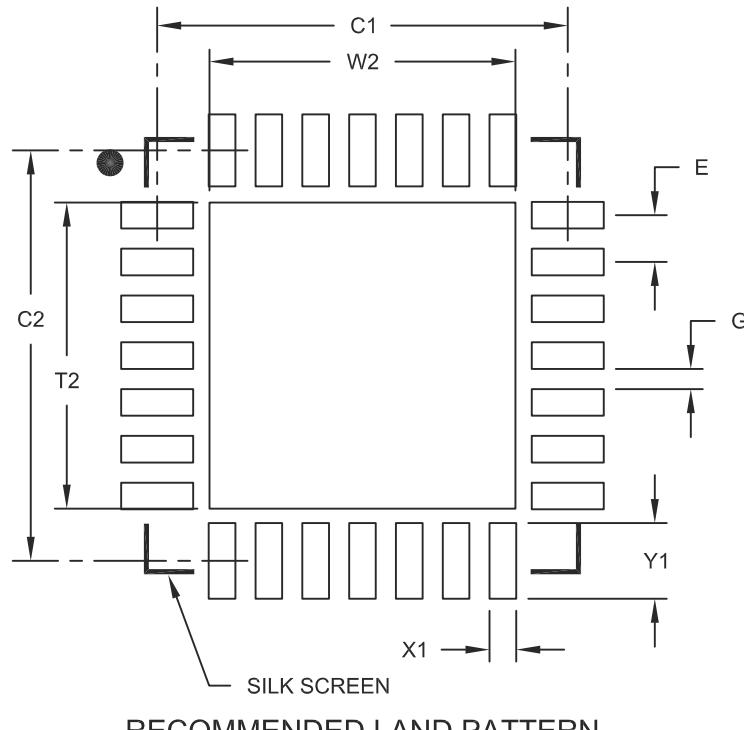
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

**28-Lead Plastic Quad Flat, No Lead Package (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 |
| Contact Pitch | | 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:

1. Dimensioning and tolerancing per ASME Y14.5M

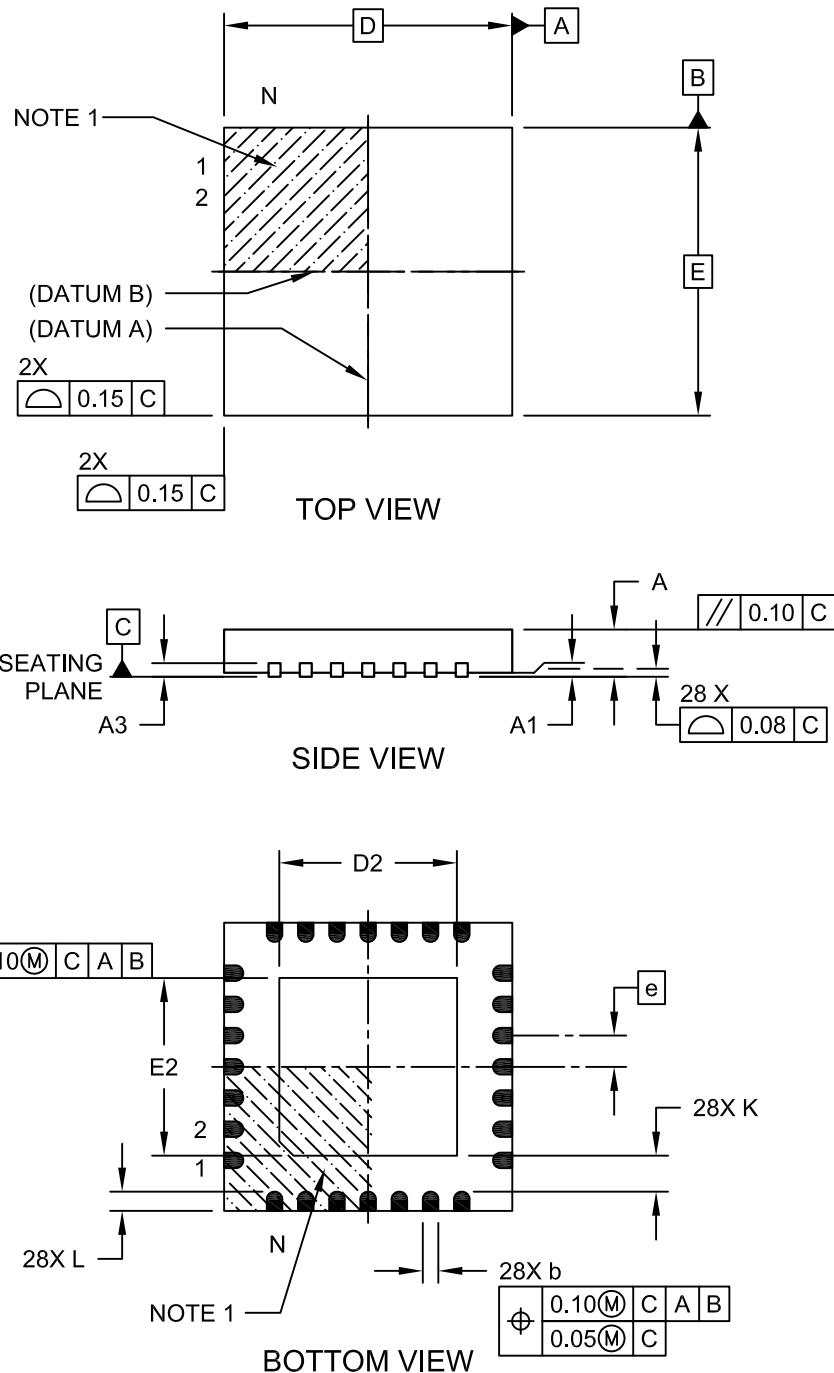
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2105A

Packaging Diagrams and Parameters

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

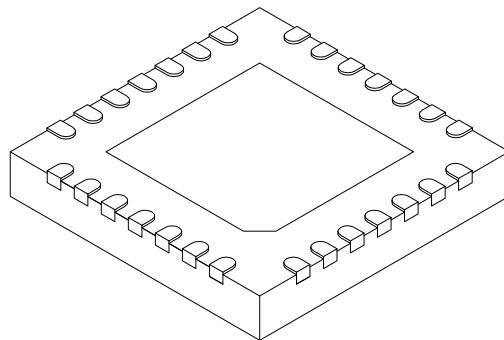
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

28-Lead Plastic Quad Flat, No Lead Package (MM) - 6x6x0.9mm Body [QFN-S] With 0.40 mm Terminal 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 | |
| Terminal 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 | |
| Terminal Width | b | 0.23 | 0.30 | 0.35 | |
| Terminal Length | L | 0.30 | 0.40 | 0.50 | |
| Terminal-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

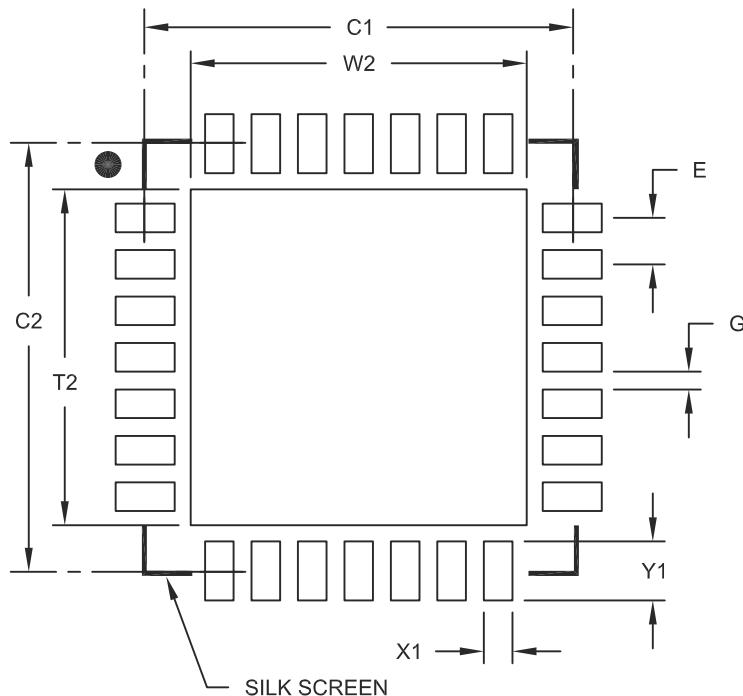
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

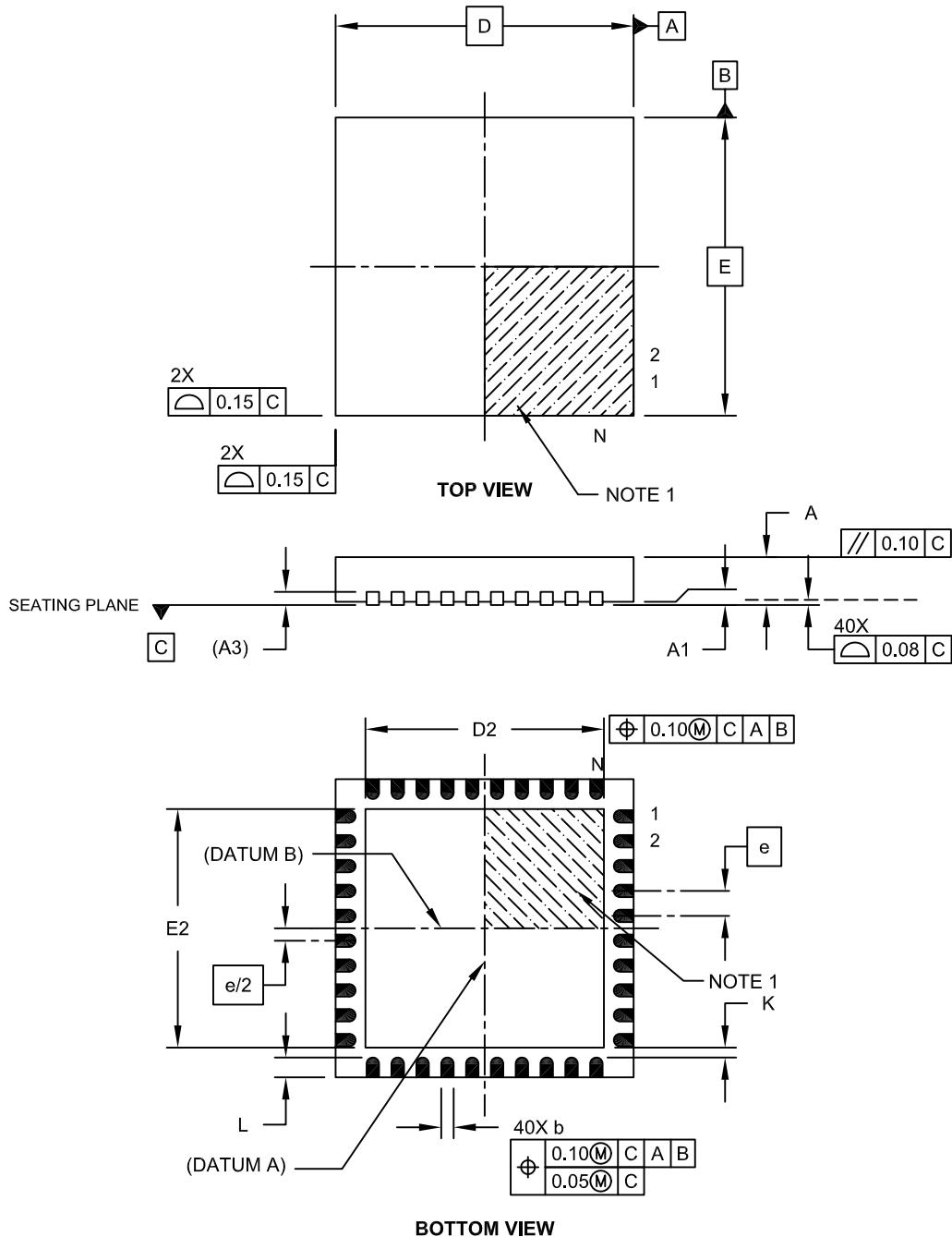
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2124A

Packaging Diagrams and Parameters

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

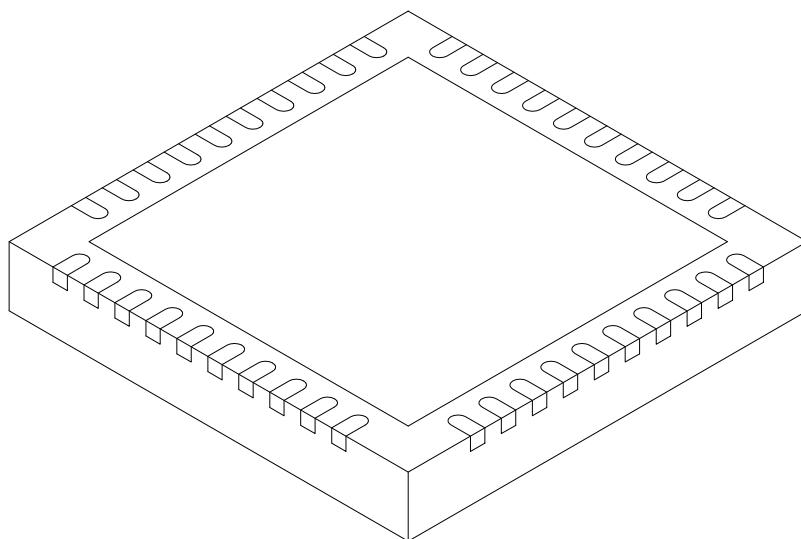
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

40-Lead Plastic Quad Flat, No Lead Package (ML) - 6x6x0.9mm Body [QFN] With 0.40mm 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 | 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.

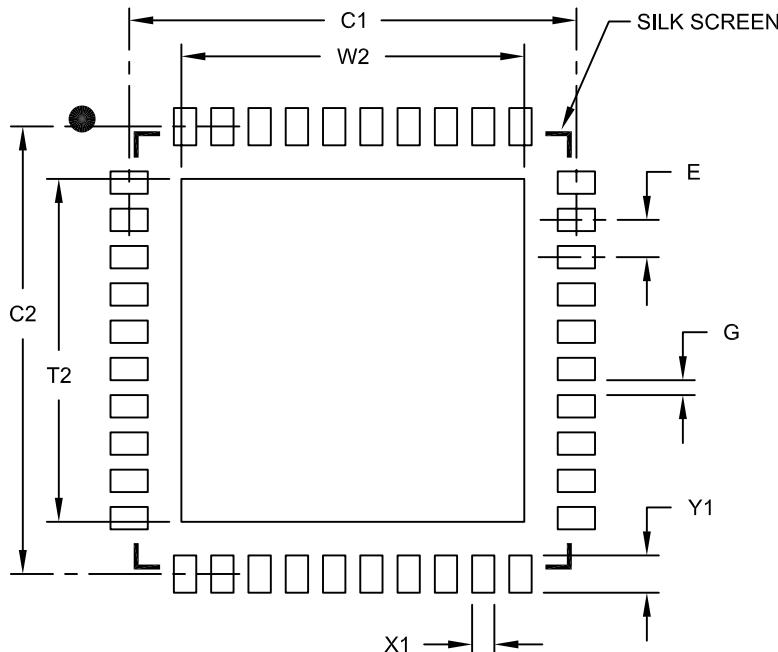
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

40-Lead Plastic Quad Flat, No Lead Package (ML) - 6x6x0.9mm Body [QFN]
With 0.40mm 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 | | 0.50 BSC | | |
| Optional Center Pad Width | W2 | | | 4.60 |
| Optional Center Pad Length | T2 | | | 4.60 |
| Contact Pad Spacing | C1 | | 6.00 | |
| Contact Pad Spacing | C2 | | 6.00 | |
| Contact Pad Width (X40) | X1 | | | 0.30 |
| Contact Pad Length (X40) | Y1 | | | 0.50 |
| Distance Between Pads | G | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

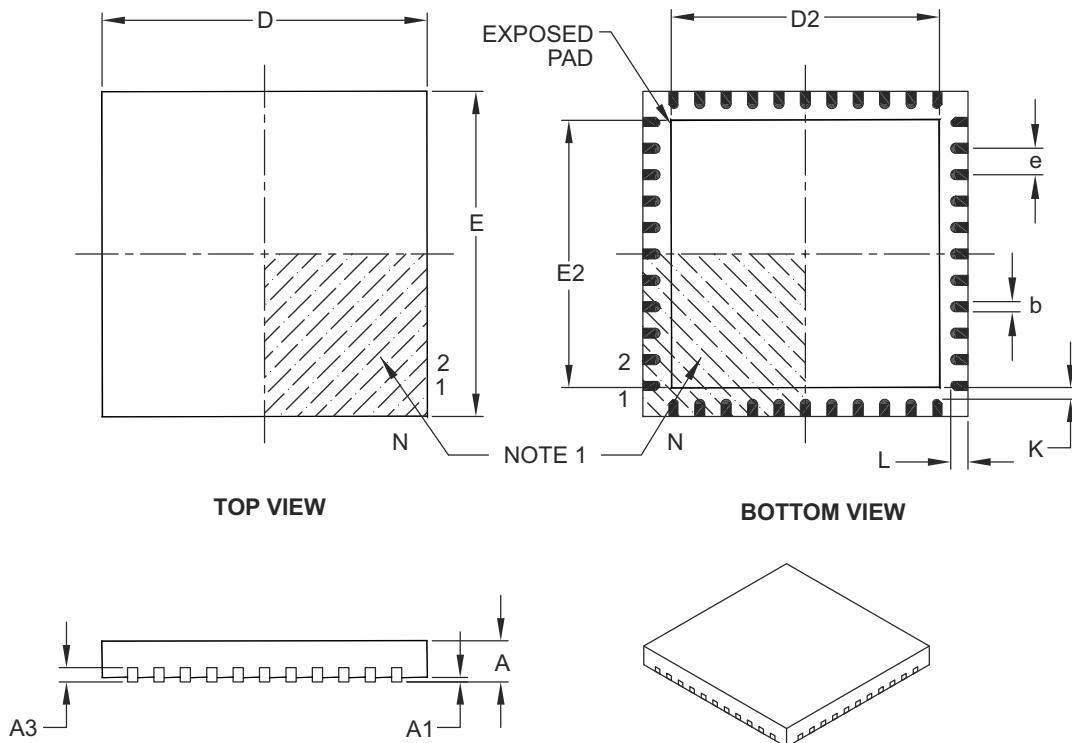
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2118A

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.

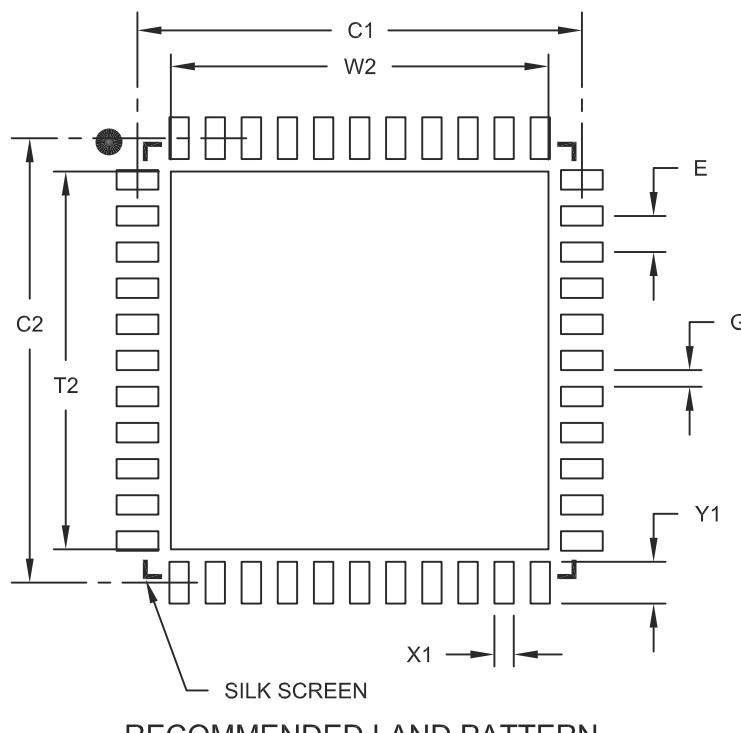
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

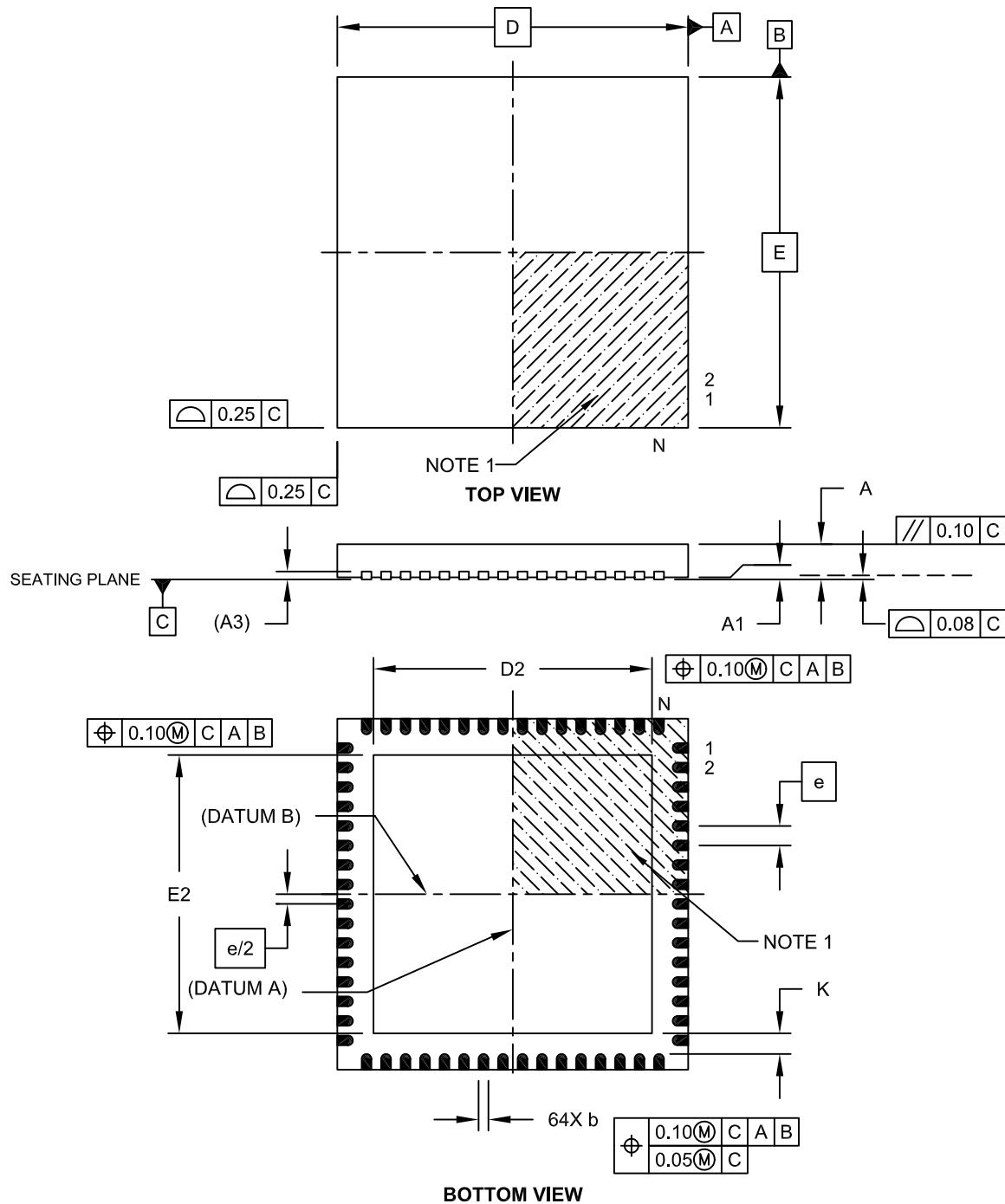
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2103A

Packaging Diagrams and Parameters

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body [QFN] With 7.15 x 7.15 Exposed Pad [QFN]

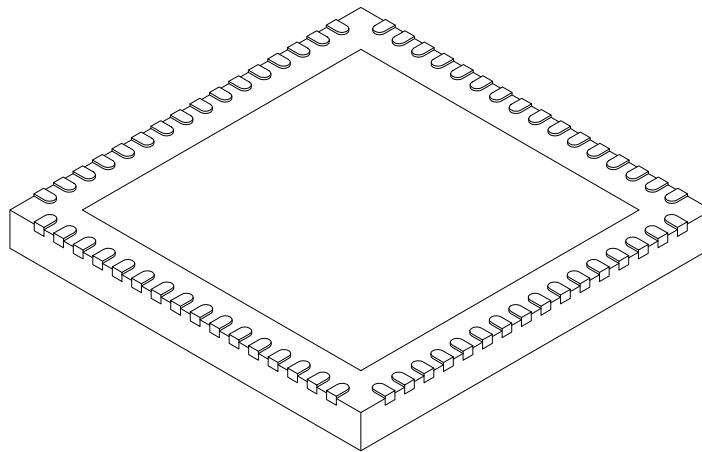
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body [QFN] With 7.15 x 7.15 Exposed Pad [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 | | 64 | | |
| 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 | 9.00 | BSC | | |
| Exposed Pad Width | E2 | 7.05 | 7.15 | 7.50 | |
| Overall Length | D | 9.00 | BSC | | |
| Exposed Pad Length | D2 | 7.05 | 7.15 | 7.50 | |
| 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.

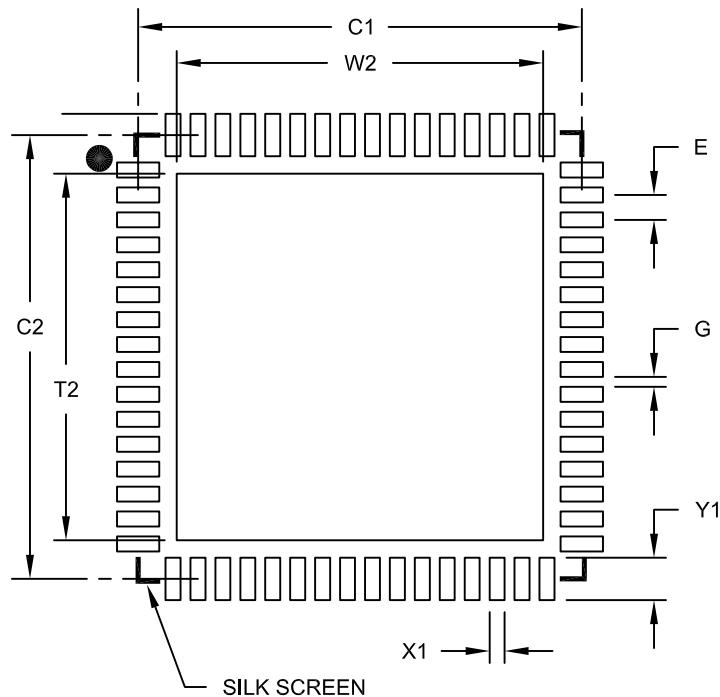
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 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 |
| Contact Pitch | E | 0.50 BSC | | |
| Optional Center Pad Width | W2 | | | 7.35 |
| Optional Center Pad Length | T2 | | | 7.35 |
| Contact Pad Spacing | C1 | | 8.90 | |
| Contact Pad Spacing | C2 | | 8.90 | |
| Contact Pad Width (X64) | X1 | | | 0.30 |
| Contact Pad Length (X64) | Y1 | | | 0.85 |
| Distance Between Pads | G | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

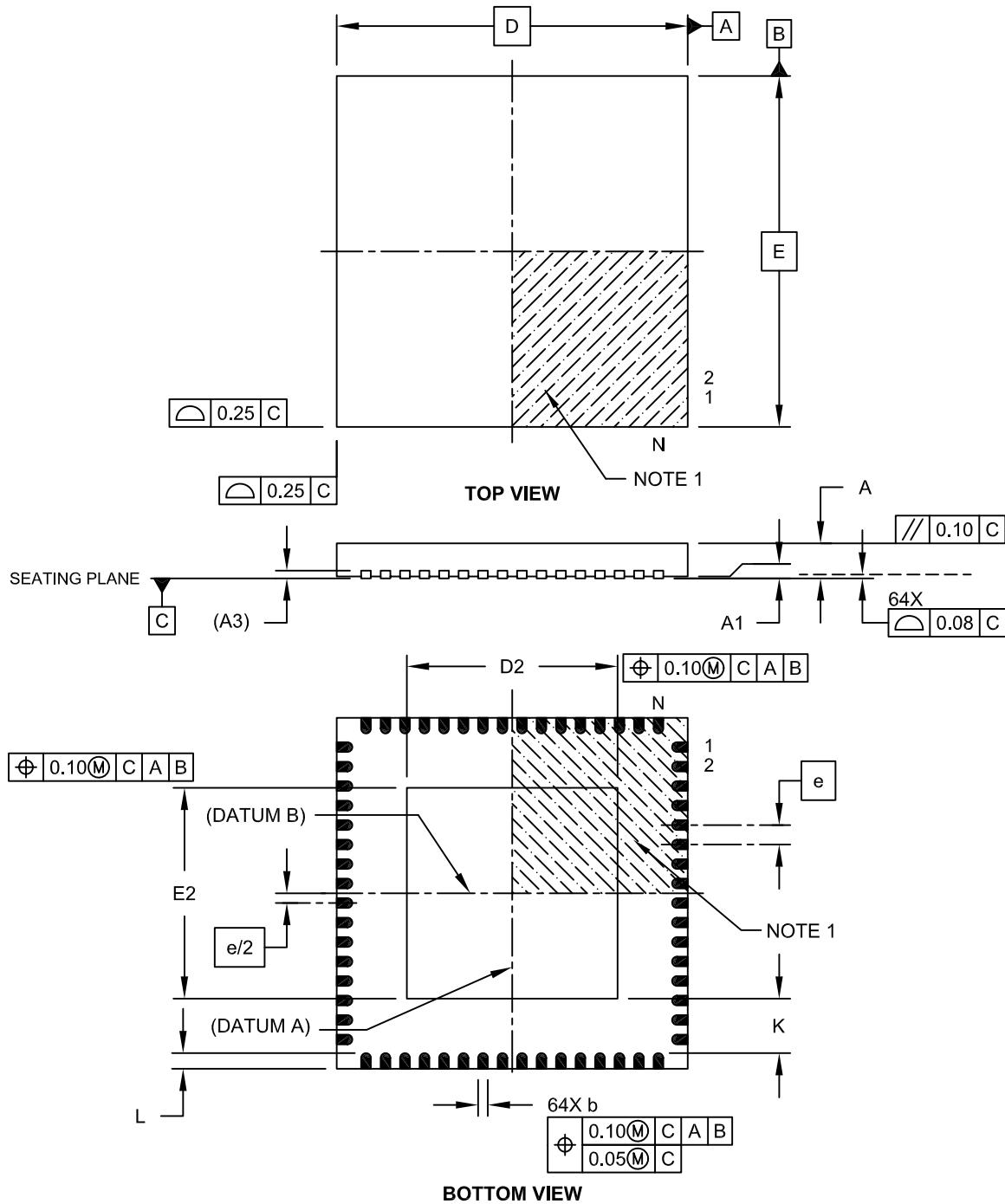
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2149A

Packaging Diagrams and Parameters

**64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body
with 5.40 x 5.40 Exposed Pad [QFN]**

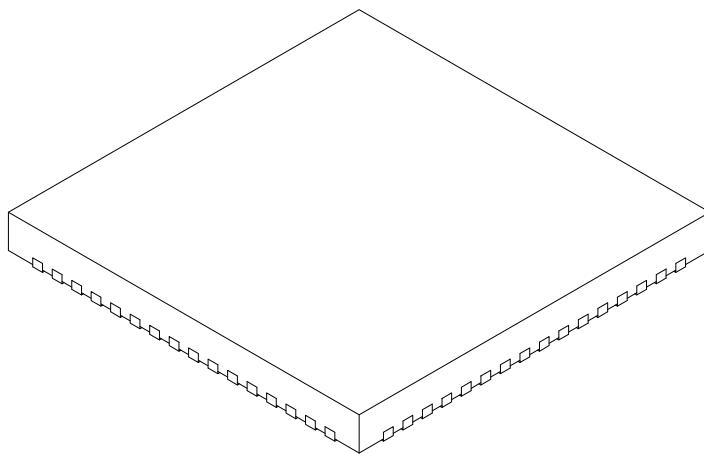
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

64-Lead Plastic Quad Flat, No Lead Package (MR) – 9x9x0.9 mm Body with 5.40 x 5.40 Exposed Pad [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 | | 64 | | |
| 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 | 9.00 | BSC | | |
| Exposed Pad Width | E2 | 5.30 | 5.40 | 5.50 | |
| Overall Length | D | 9.00 | BSC | | |
| Exposed Pad Length | D2 | 5.30 | 5.40 | 5.50 | |
| 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.

Packaging Diagrams and Parameters

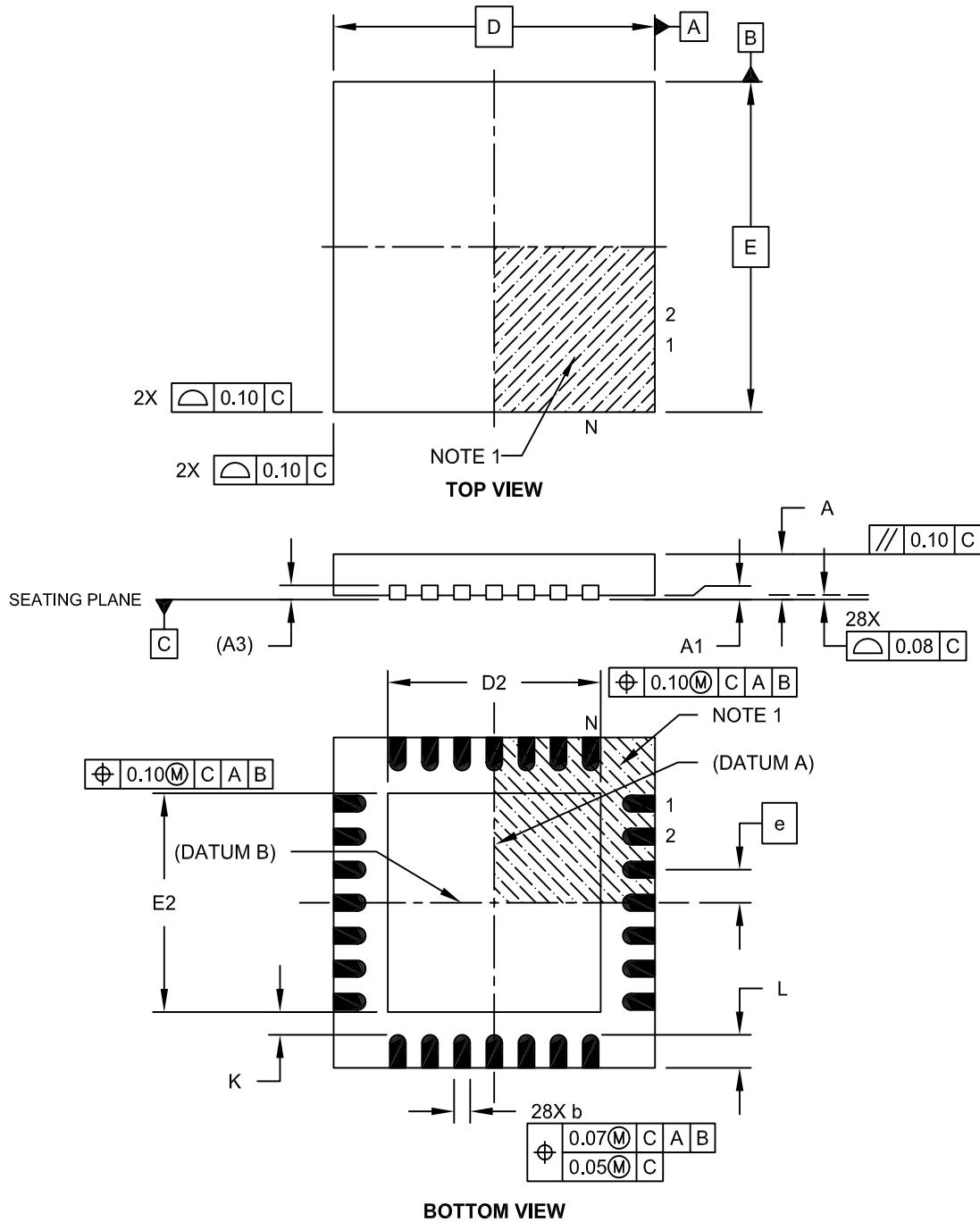
UQFN Family

Ultra Thin Quad Flat, No Lead Packages

Packaging Diagrams and Parameters

28-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) – 4x4x0.5 mm Body [UQFN]

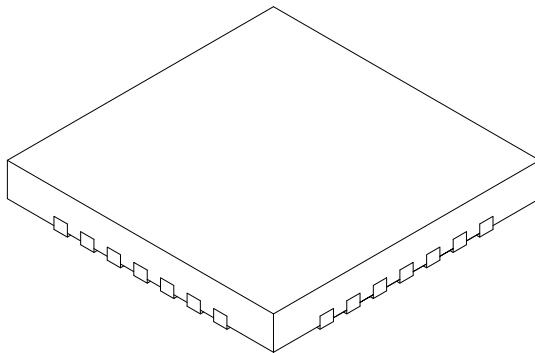
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

28-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) – 4x4x0.5 mm Body [UQFN]

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 | 0.45 | 0.50 | 0.55 | |
| Standoff | A1 | 0.00 | 0.02 | 0.05 | |
| Contact Thickness | A3 | | 0.127 | REF | |
| Overall Width | E | | 4.00 | BSC | |
| Exposed Pad Width | E2 | 2.55 | 2.65 | 2.75 | |
| Overall Length | D | | 4.00 | BSC | |
| Exposed Pad Length | D2 | 2.55 | 2.65 | 2.75 | |
| Contact Width | b | 0.15 | 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.

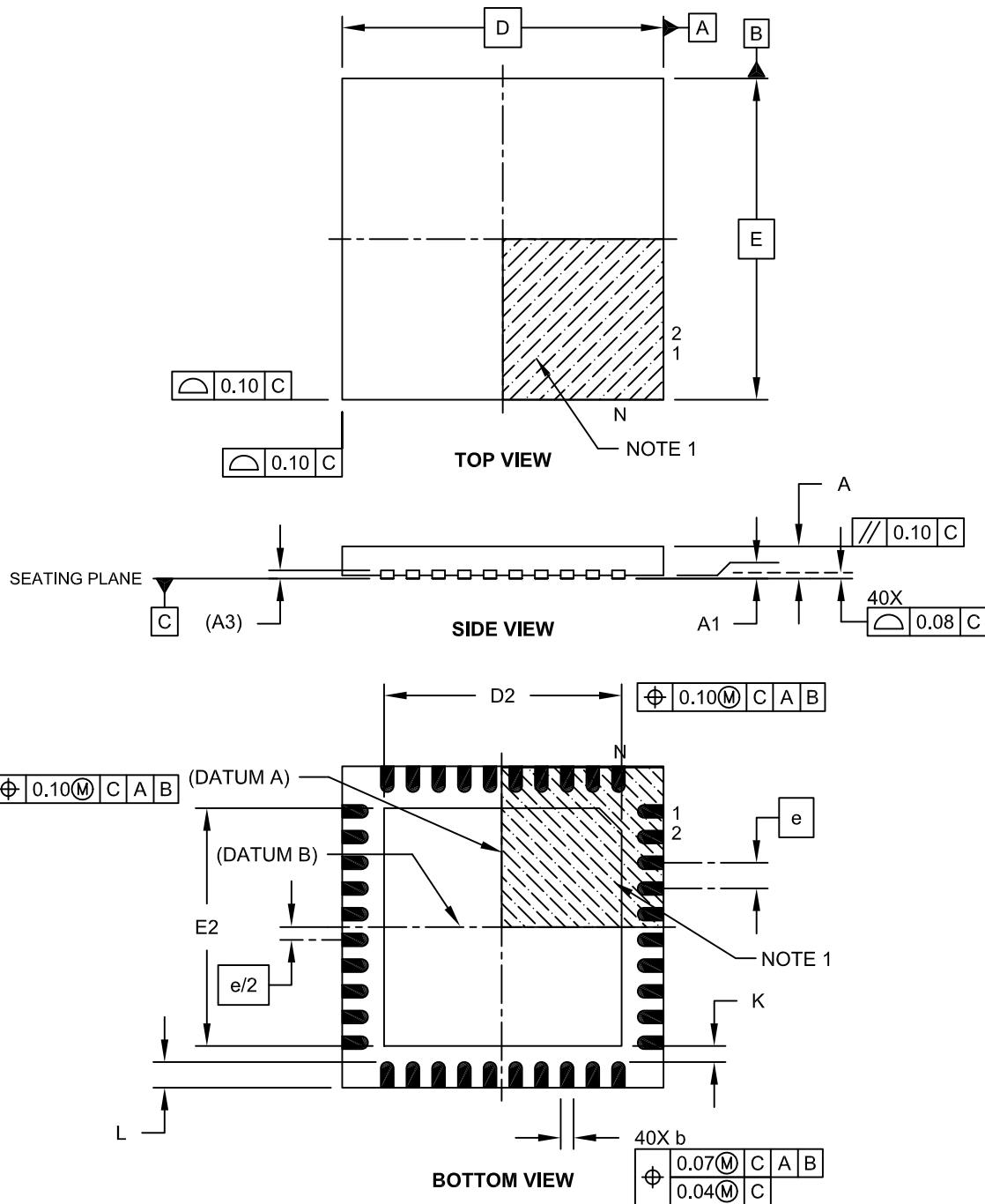
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

40-Lead Ultra Thin Plastic Quad Flat, No Lead Package (MV) – 5x5x0.5 mm Body [UQFN]

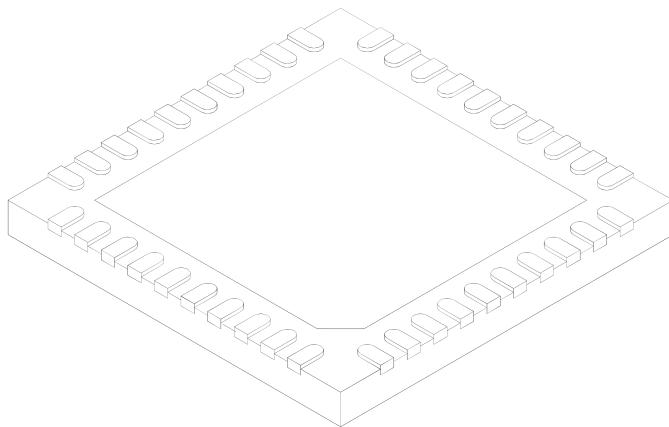
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

40-Lead Ultra Thin Plastic Quad Flat, No Lead Package (MV) – 5x5x0.5 mm Body [UQFN]

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 | | 0.40 | BSC | |
| Overall Height | A | 0.45 | 0.50 | 0.55 | |
| Standoff | A1 | 0.00 | 0.02 | 0.05 | |
| Contact Thickness | A3 | | 0.127 | REF | |
| Overall Width | E | | 5.00 | BSC | |
| Exposed Pad Width | E2 | 3.60 | 3.70 | 3.80 | |
| Overall Length | D | | 5.00 | BSC | |
| Exposed Pad Length | D2 | 3.60 | 3.70 | 3.80 | |
| Contact Width | b | 0.15 | 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.

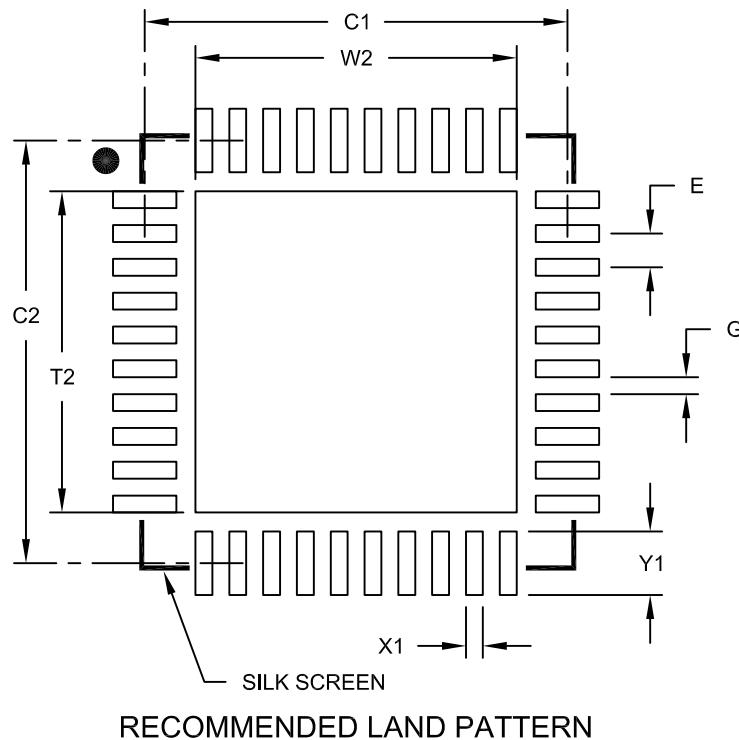
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

40-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) - 5x5 mm Body [UQFN]

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 | |
| Optional Center Pad Width | W2 | | | 3.80 | |
| Optional Center Pad Length | T2 | | | 3.80 | |
| Contact Pad Spacing | C1 | | 5.00 | | |
| Contact Pad Spacing | C2 | | 5.00 | | |
| Contact Pad Width (X40) | X1 | | | 0.20 | |
| Contact Pad Length (X40) | Y1 | | | 0.75 | |
| Distance Between Pads | G | 0.20 | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

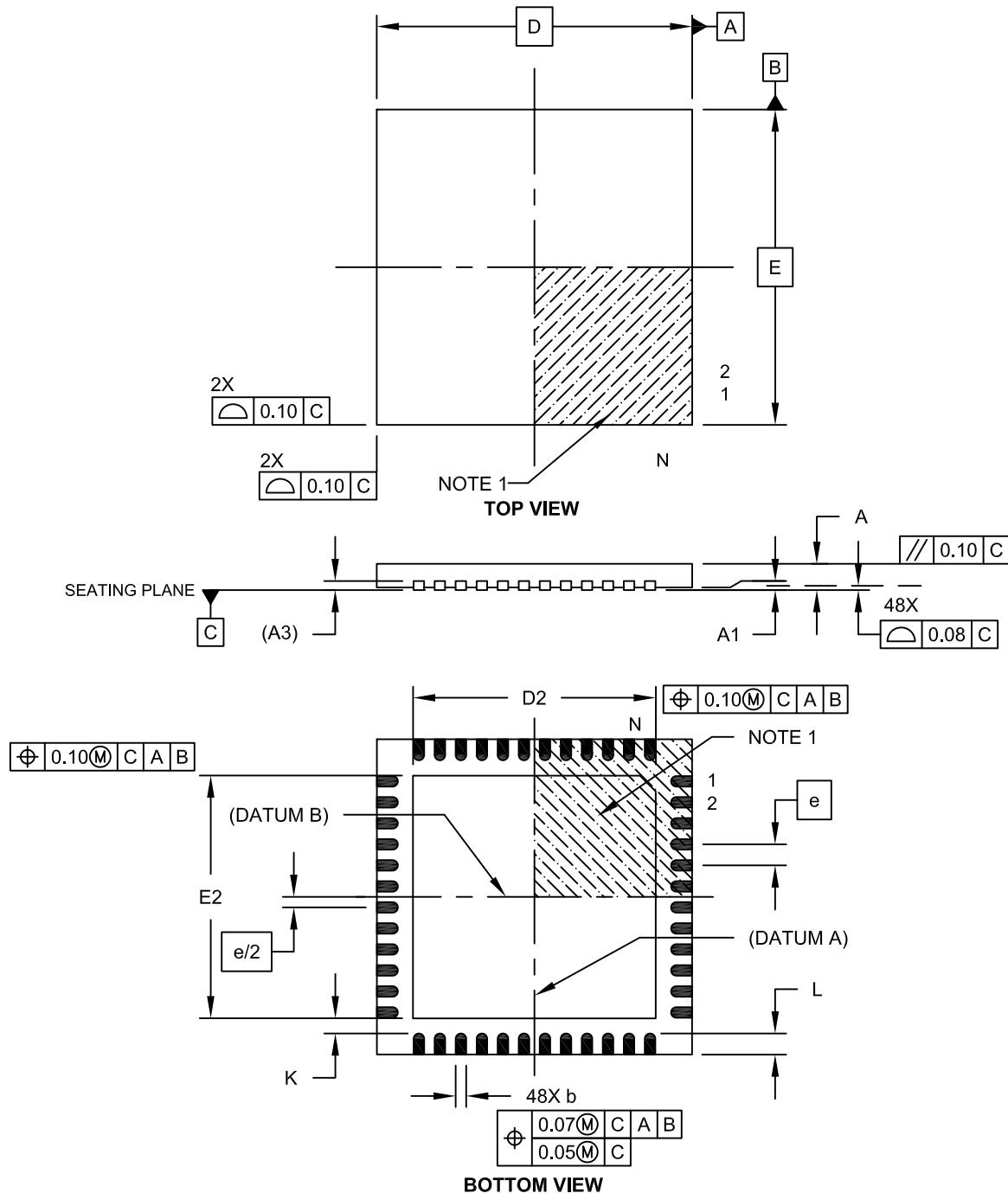
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2156B

Packaging Diagrams and Parameters

48-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) – 6x6x0.5 mm Body [UQFN]

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

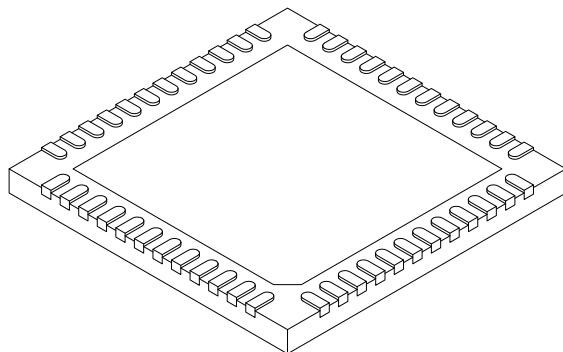


Microchip Technology Drawing C04-153A Sheet 1 of 2

Packaging Diagrams and Parameters

48-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) – 6x6x0.5 mm Body [UQFN]

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 | | 48 | | |
| Pitch | e | | 0.40 | BSC | |
| Overall Height | A | 0.45 | 0.50 | 0.55 | |
| Standoff | A1 | 0.00 | 0.02 | 0.05 | |
| Contact Thickness | A3 | 0.127 | REF | | |
| Overall Width | E | 6.00 | BSC | | |
| Exposed Pad Width | E2 | 4.45 | 4.60 | 4.75 | |
| Overall Length | D | 6.00 | BSC | | |
| Exposed Pad Length | D2 | 4.45 | 4.60 | 4.75 | |
| Contact Width | b | 0.15 | 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.

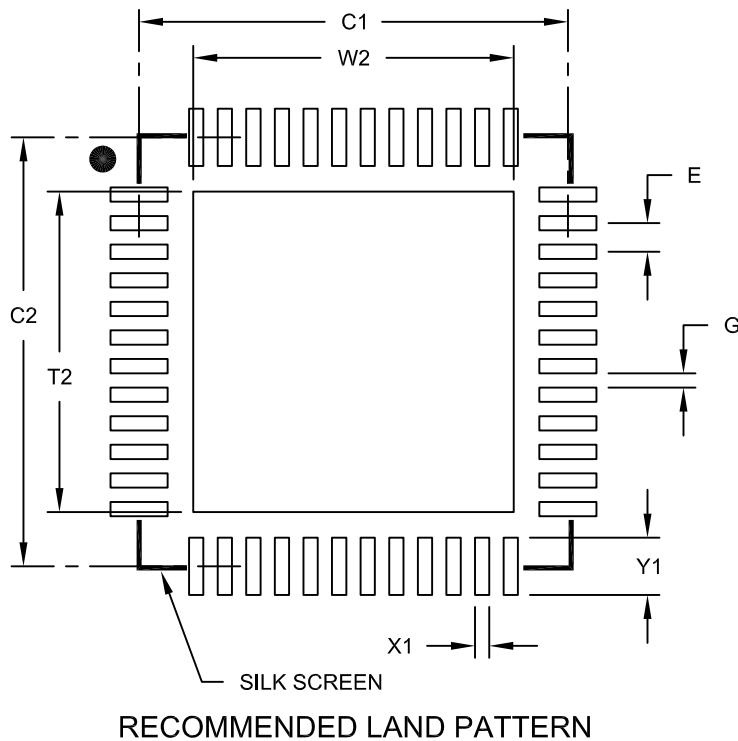
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

48-Lead Ultra Thin Plastic Quad Flat, No Lead Package (MV) - 6x6 mm Body [UQFN]
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>



| Dimension Limits | Units | MILLIMETERS | | |
|----------------------------|-------|-------------|------|------|
| | | MIN | NOM | MAX |
| Contact Pitch | E | | 0.40 | BSC |
| Optional Center Pad Width | W2 | | | 4.45 |
| Optional Center Pad Length | T2 | | | 4.45 |
| Contact Pad Spacing | C1 | | 6.00 | |
| Contact Pad Spacing | C2 | | 6.00 | |
| Contact Pad Width (X28) | X1 | | | 0.20 |
| Contact Pad Length (X28) | Y1 | | | 0.80 |
| 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. C04-2153A

Packaging Diagrams and Parameters

Packaging Diagrams and Parameters

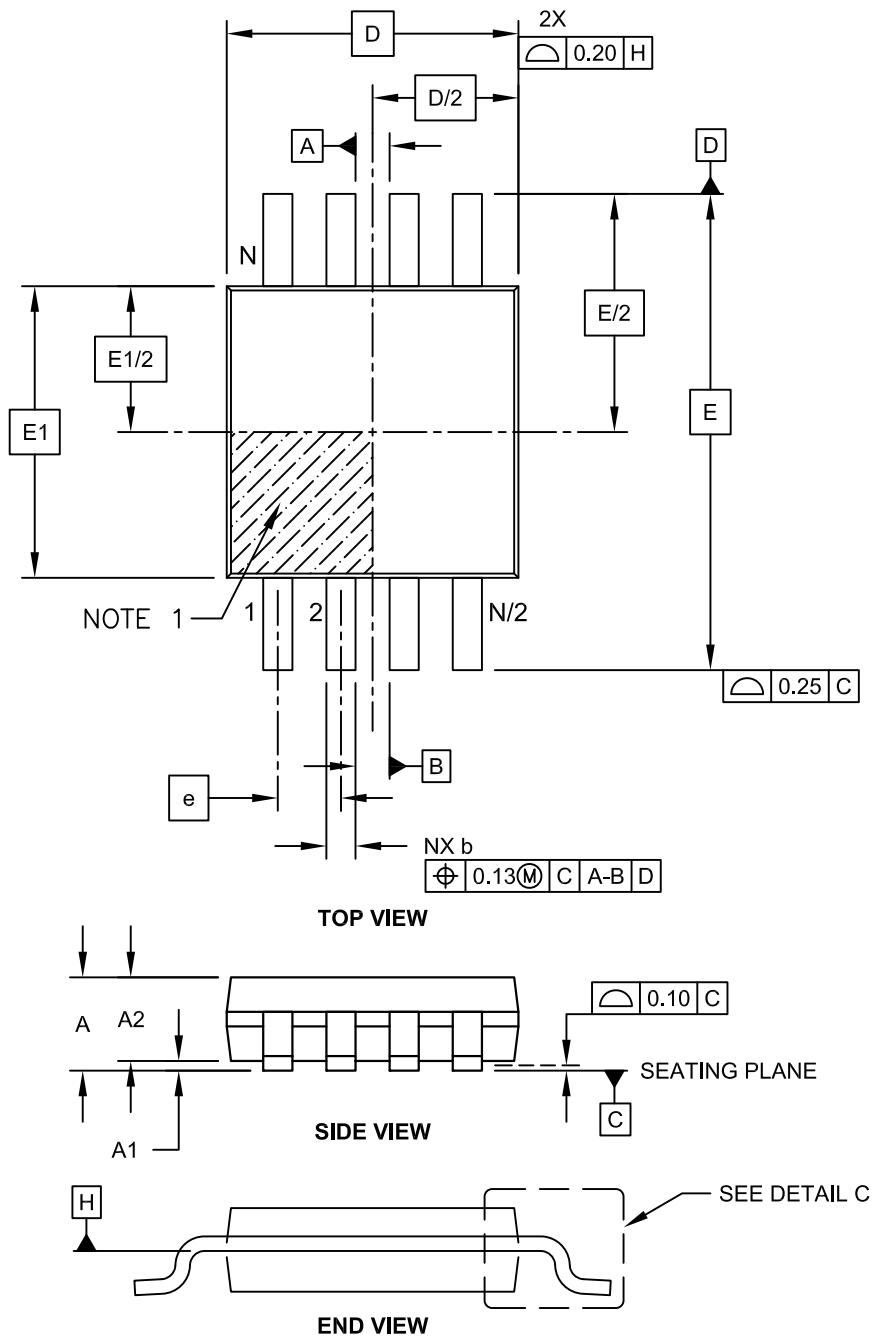
MSOP Family

Micro Small Outline Packages

Packaging Diagrams and Parameters

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

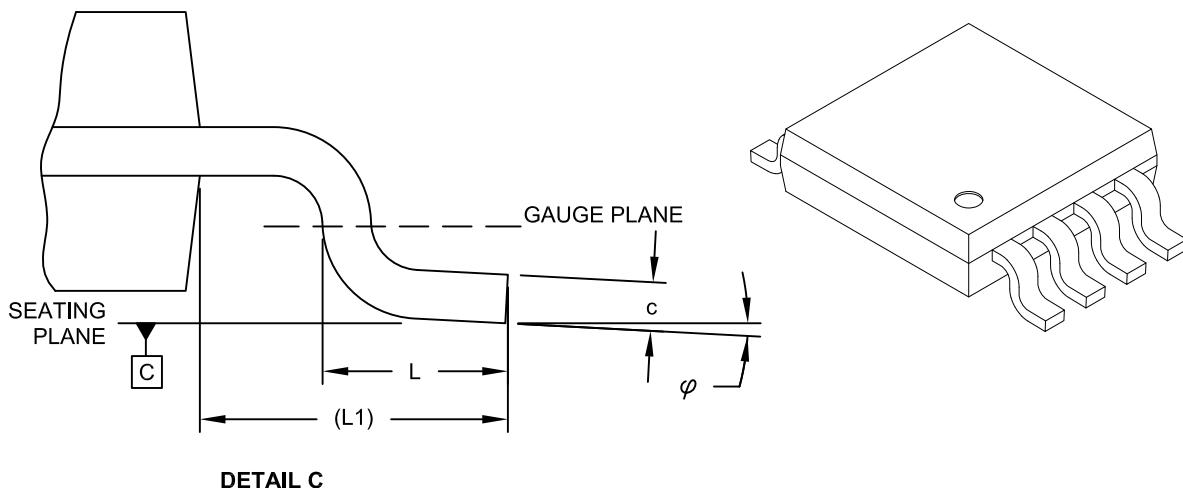
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

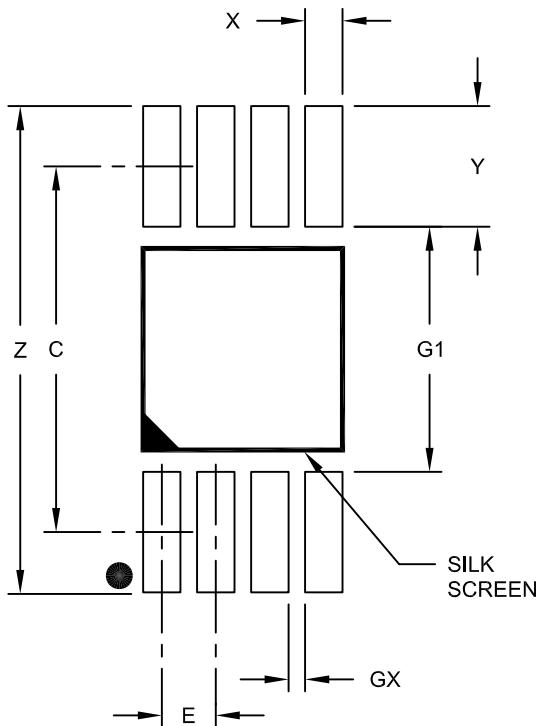
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| | | Units | MILLIMETERS | | |
|-------------------------|----|-------|-------------|------|-----|
| Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | E | | 0.65 | BSC | |
| Contact Pad Spacing | C | | 4.40 | | |
| Overall Width | Z | | | 5.85 | |
| Contact Pad Width (X8) | X1 | | | 0.45 | |
| Contact Pad Length (X8) | Y1 | | | 1.45 | |
| Distance Between Pads | G1 | 2.95 | | | |
| Distance Between Pads | GX | 0.20 | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

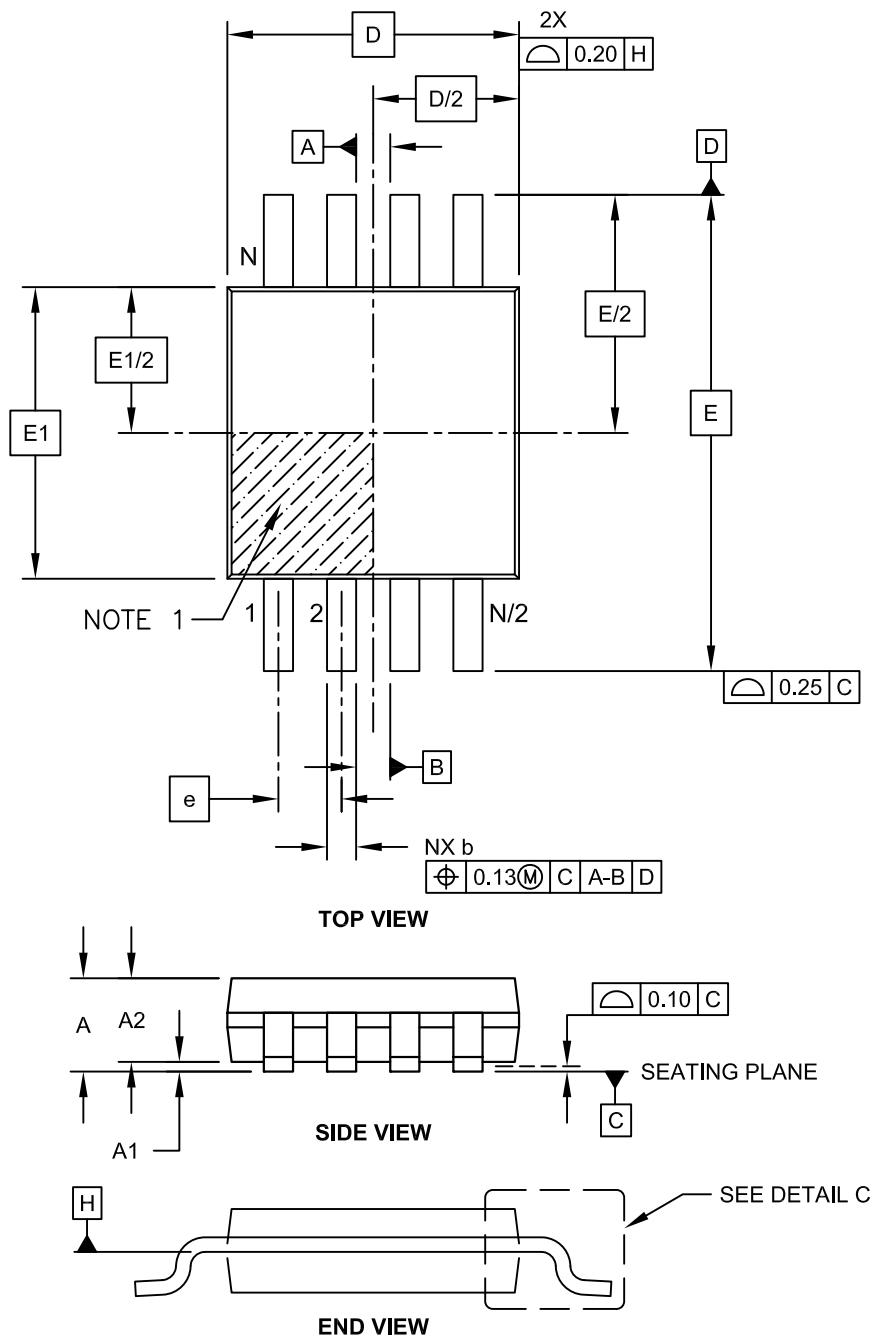
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2111A

Packaging Diagrams and Parameters

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

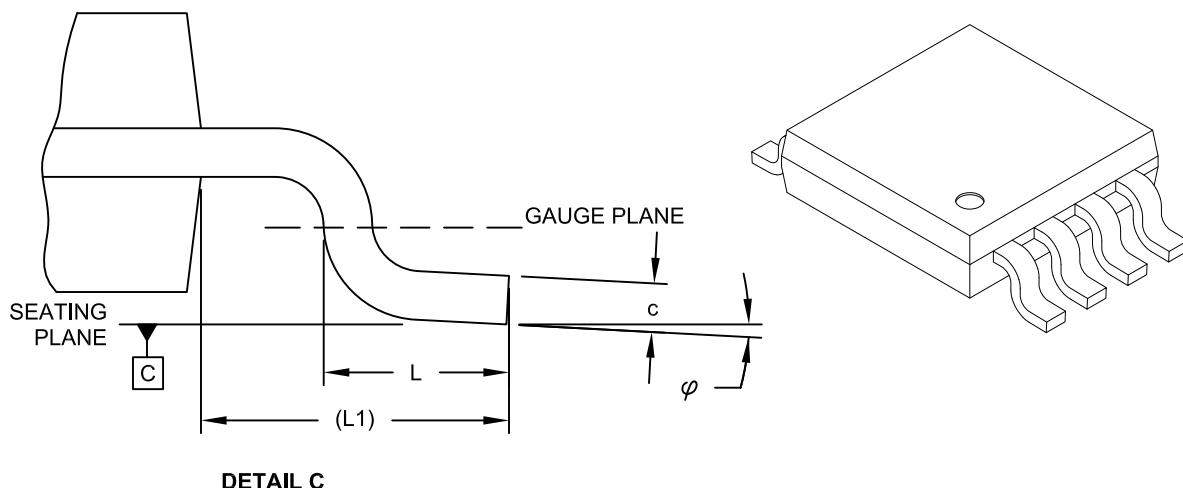
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

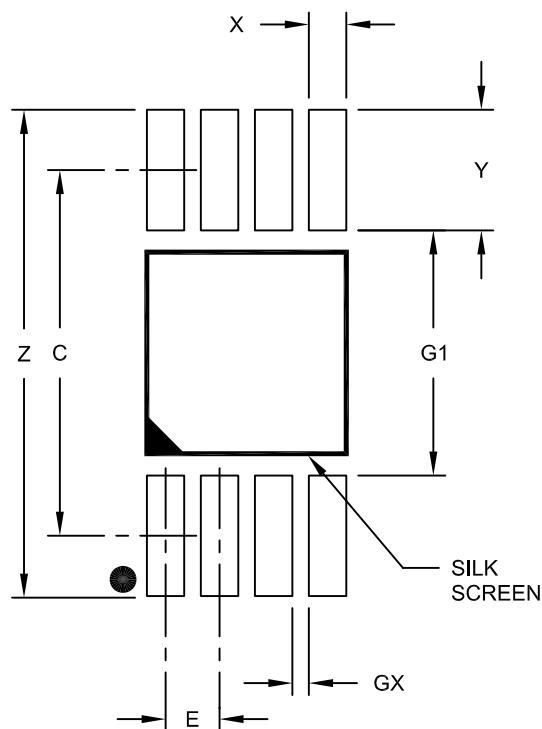
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Dimension Limits | | Units | MILLIMETERS | | |
|-------------------------|----|-------|-------------|------|-----|
| | | | MIN | NOM | MAX |
| Contact Pitch | E | | 0.65 | BSC | |
| Contact Pad Spacing | C | | 4.40 | | |
| Overall Width | Z | | | 5.85 | |
| Contact Pad Width (X8) | X1 | | | 0.45 | |
| Contact Pad Length (X8) | Y1 | | | 1.45 | |
| Distance Between Pads | G1 | 2.95 | | | |
| Distance Between Pads | GX | 0.20 | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

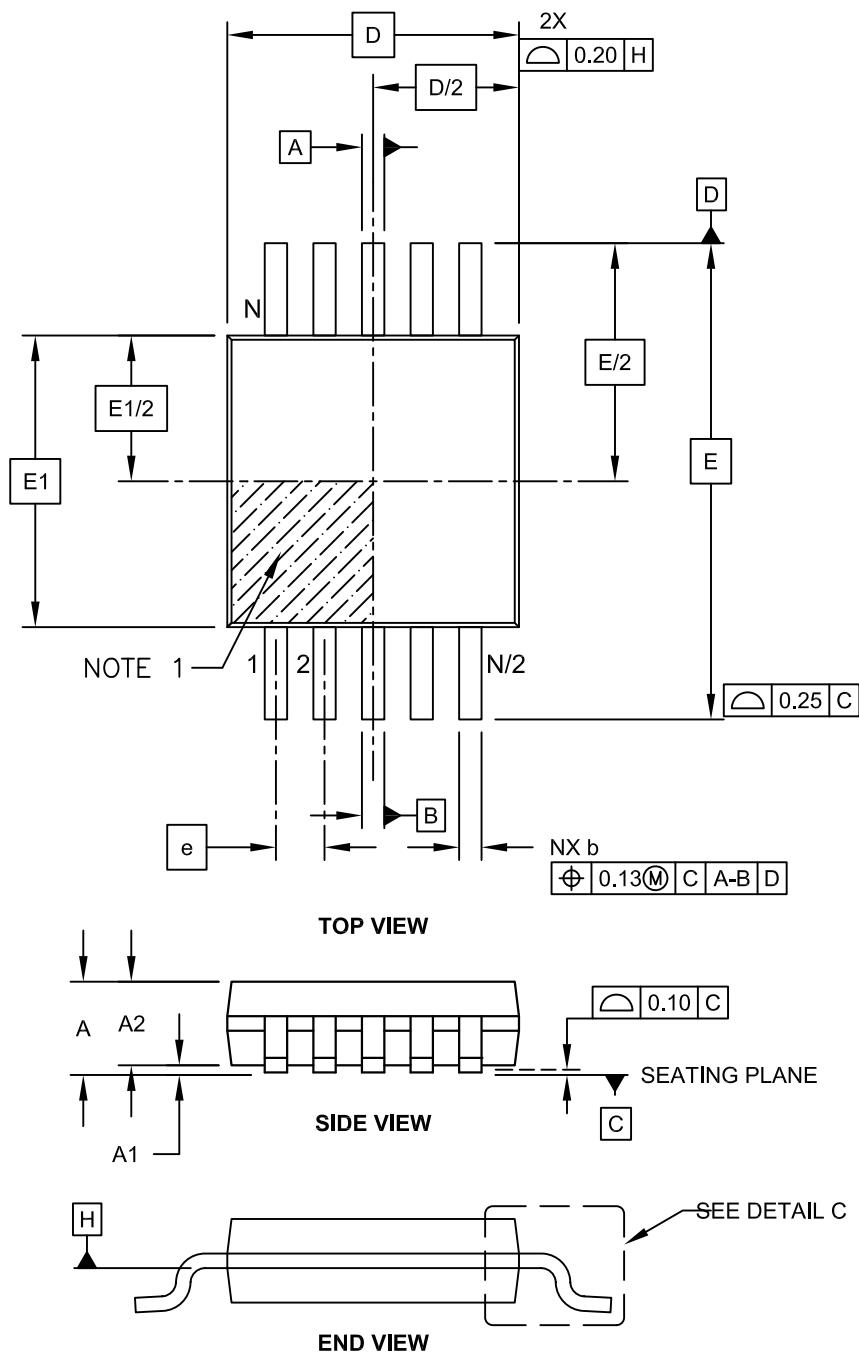
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2111A

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>

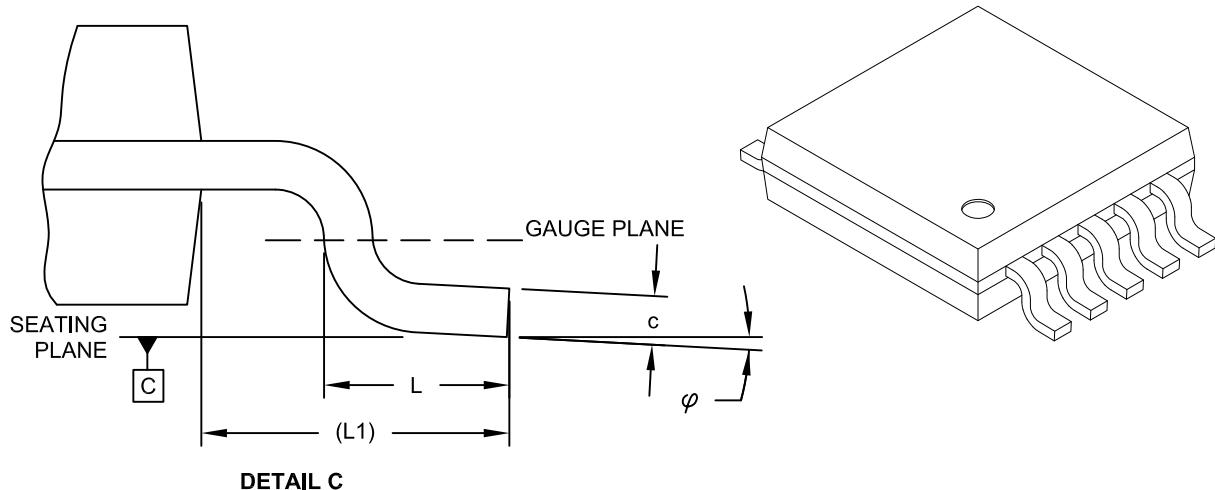


Microchip Technology Drawing C04-021C Sheet 1 of 2

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 0.15mm per side.

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

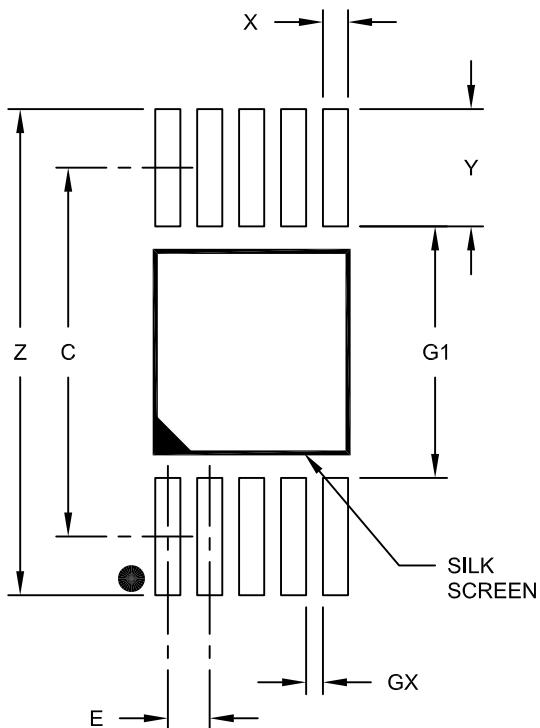
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|--------------------------|----|-------------|------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | 0.50 | BSC | |
| Contact Pad Spacing | C | 4.40 | | |
| Overall Width | Z | | 5.80 | |
| Contact Pad Width (X10) | X1 | | 0.30 | |
| Contact Pad Length (X10) | Y1 | | | 1.40 |
| Distance Between Pads | G1 | 3.00 | | |
| Distance Between Pads | GX | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

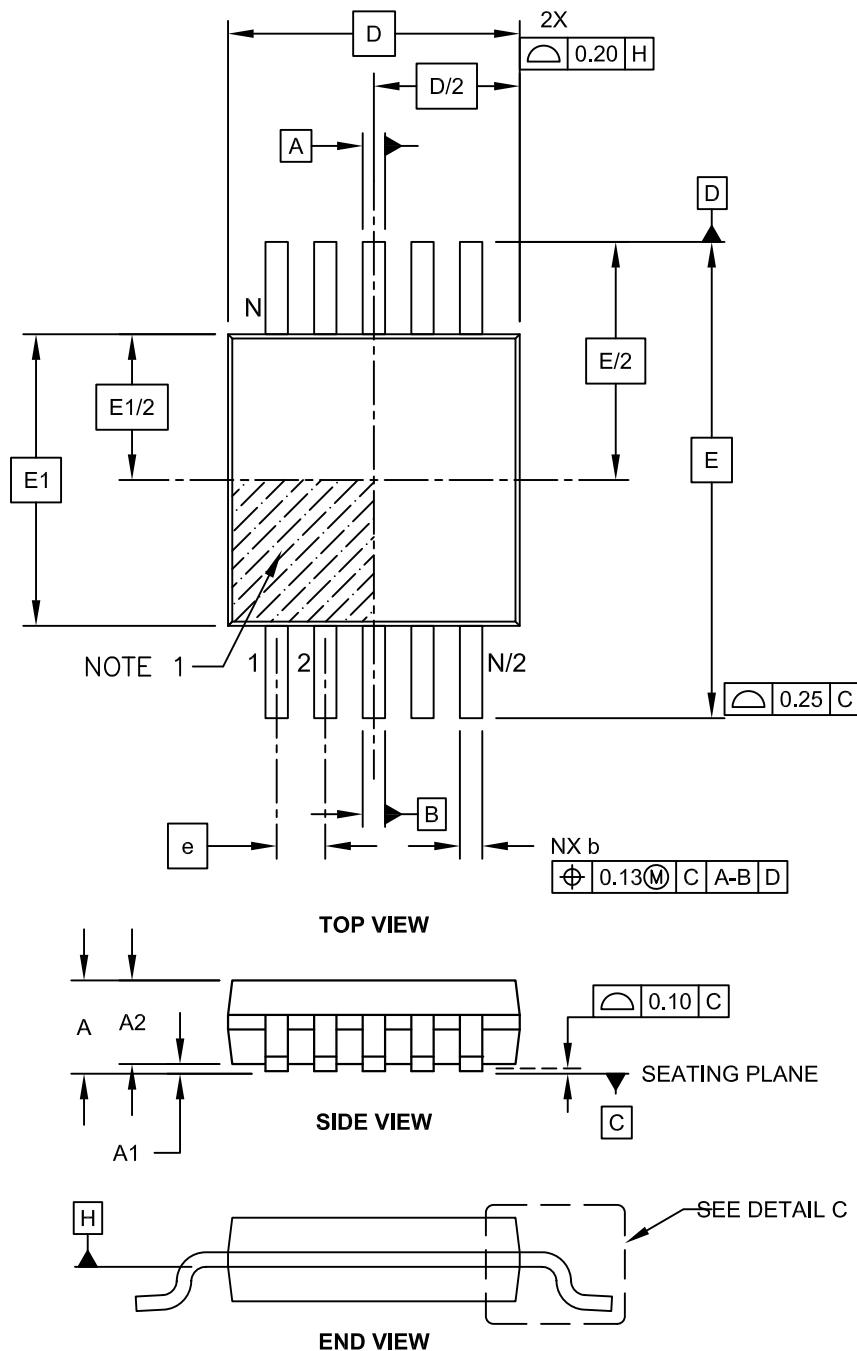
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2021A

Packaging Diagrams and Parameters

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

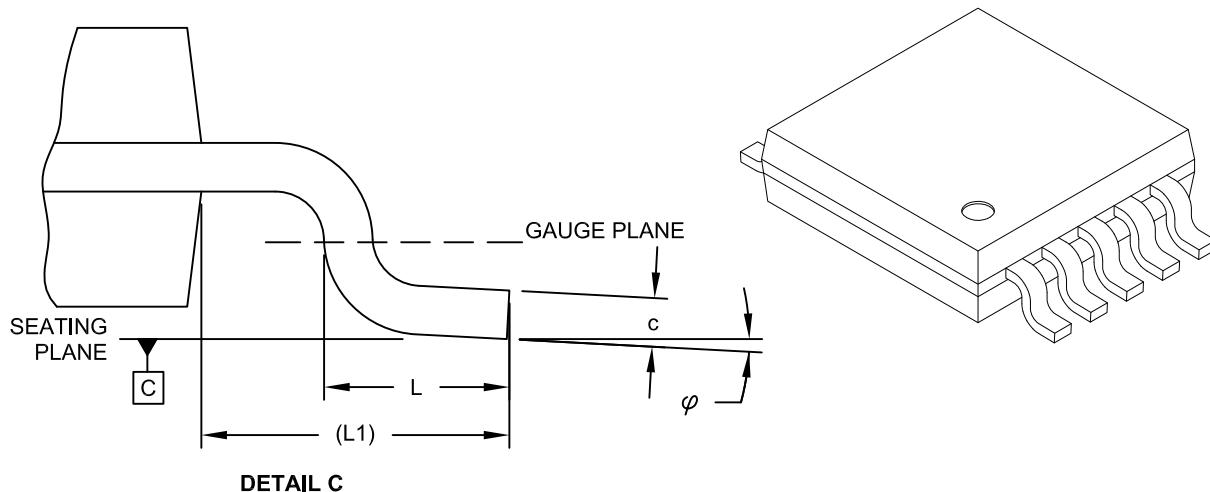
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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:

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 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M.

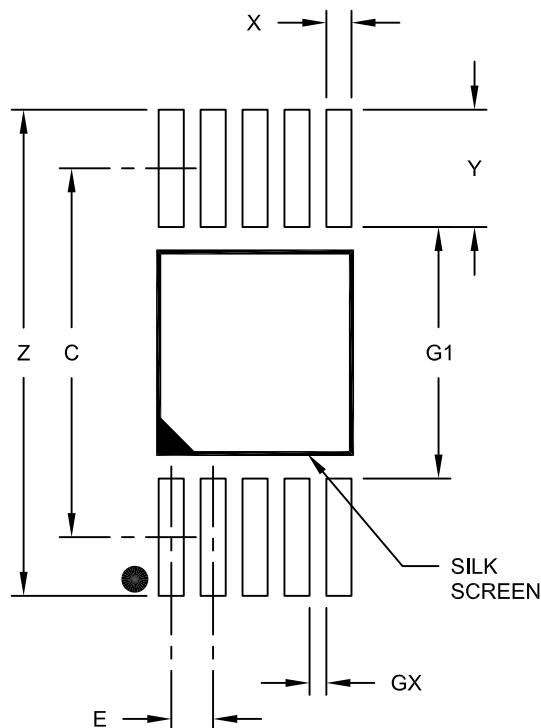
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|--------------------------|----|-------------|------|------|
| Dimension Limits | | MIN | NOM | MAX |
| Contact Pitch | E | 0.50 | BSC | |
| Contact Pad Spacing | C | | 4.40 | |
| Overall Width | Z | | | 5.80 |
| Contact Pad Width (X10) | X1 | | | 0.30 |
| Contact Pad Length (X10) | Y1 | | | 1.40 |
| Distance Between Pads | G1 | 3.00 | | |
| Distance Between Pads | GX | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

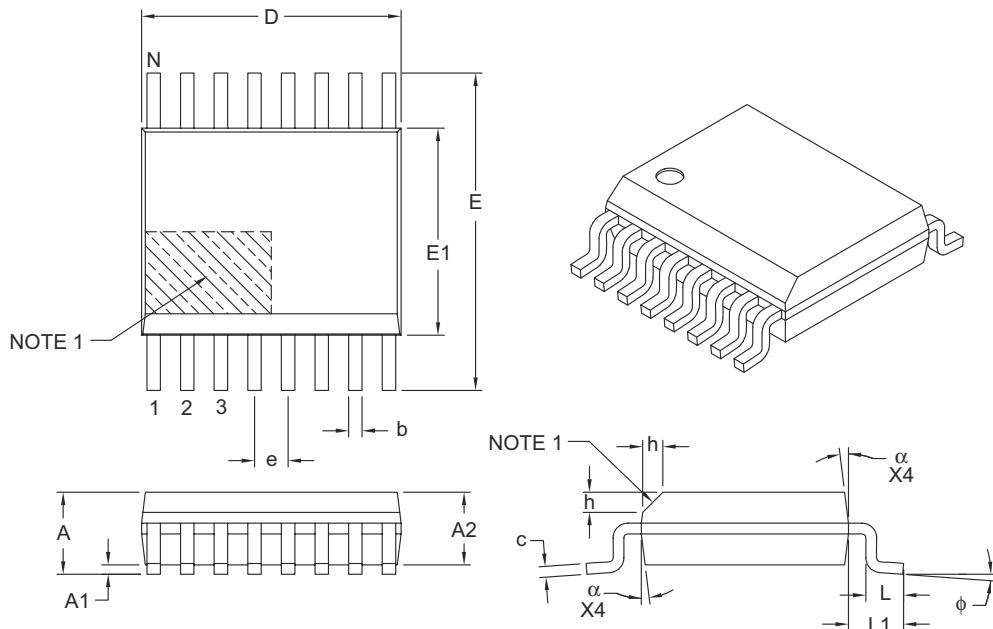
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2021A

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>



| | | 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 | phi | 0° | – | 8° |
| Molded Draft Angle | alpha | 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.

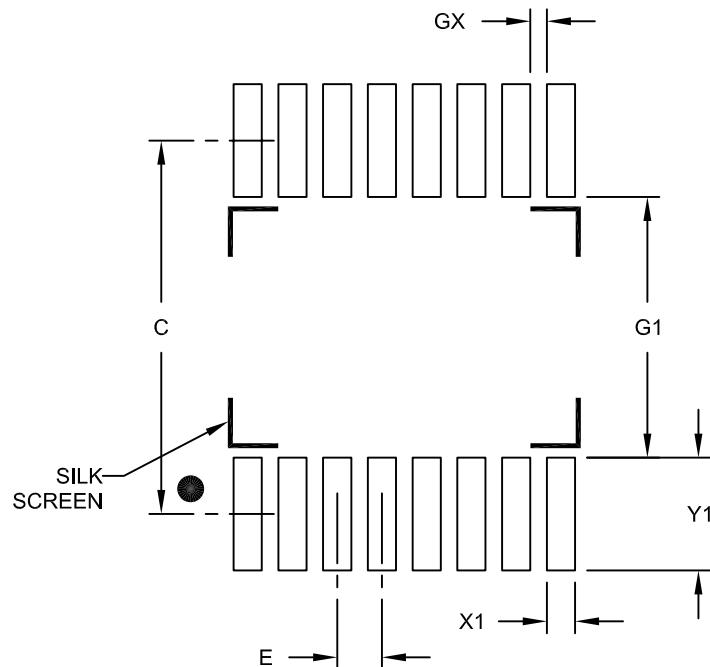
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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 |
| Contact Pitch | E | | .025 | BSC |
| Contact Pad Spacing | C | | .209 | |
| Contact Pad Width (X16) | X1 | | | .016 |
| Contact Pad Length (X16) | Y1 | | | .063 |
| Distance Between Pads | GX | .009 | | |
| Distance Between Pads | G1 | .146 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2024A



MICROCHIP

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

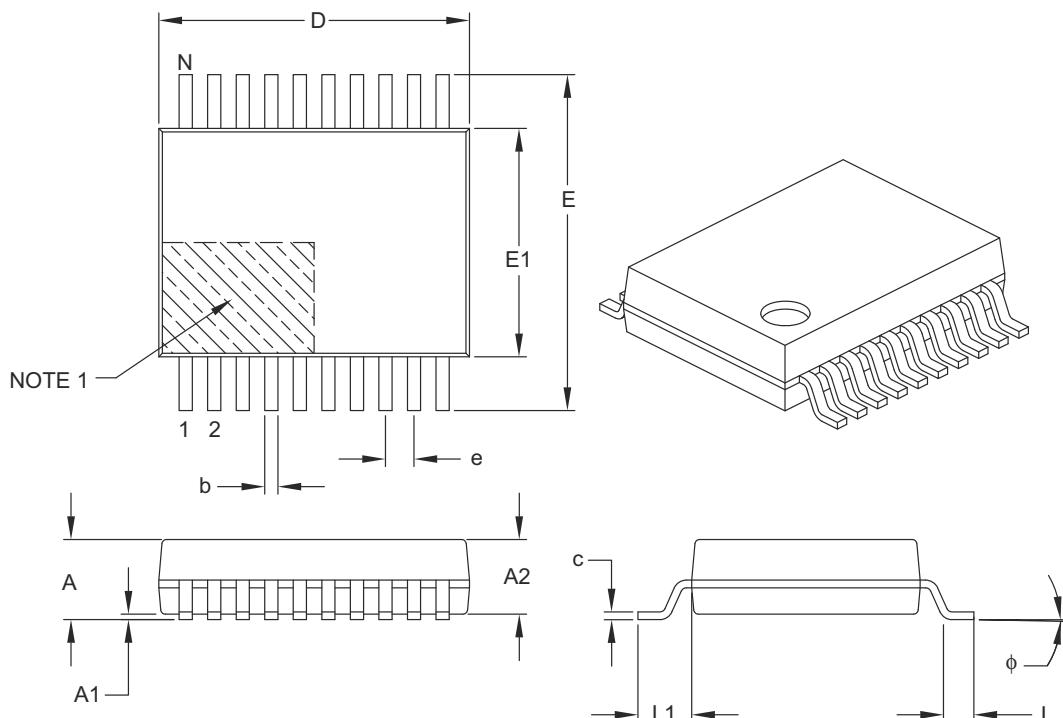
SSOP Family

Shrink Small Outline Packages

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.

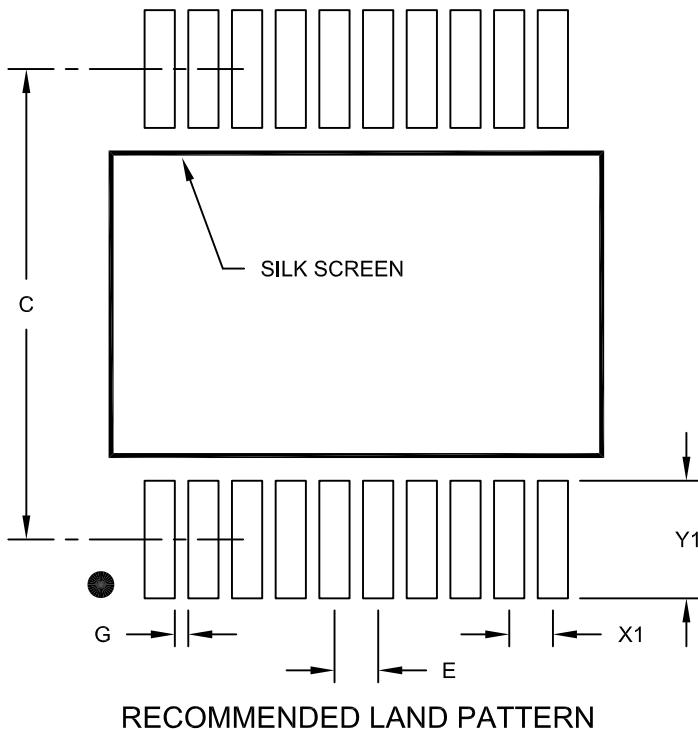
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-072B

Land Pattern (Footprint)

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 |
| Contact Pitch | E | | 0.65 BSC | |
| Contact Pad Spacing | C | | 7.20 | |
| Contact Pad Width (X20) | X1 | | | 0.45 |
| Contact Pad Length (X20) | Y1 | | | 1.75 |
| Distance Between Pads | G | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

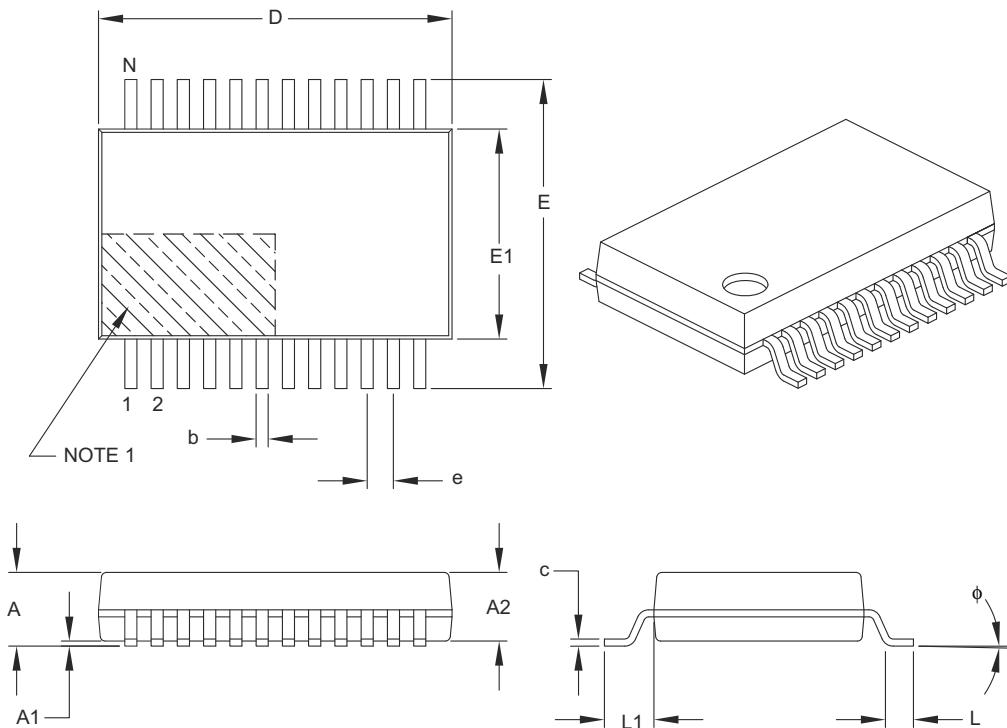
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2072A

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 | | | |
| 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 | 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.

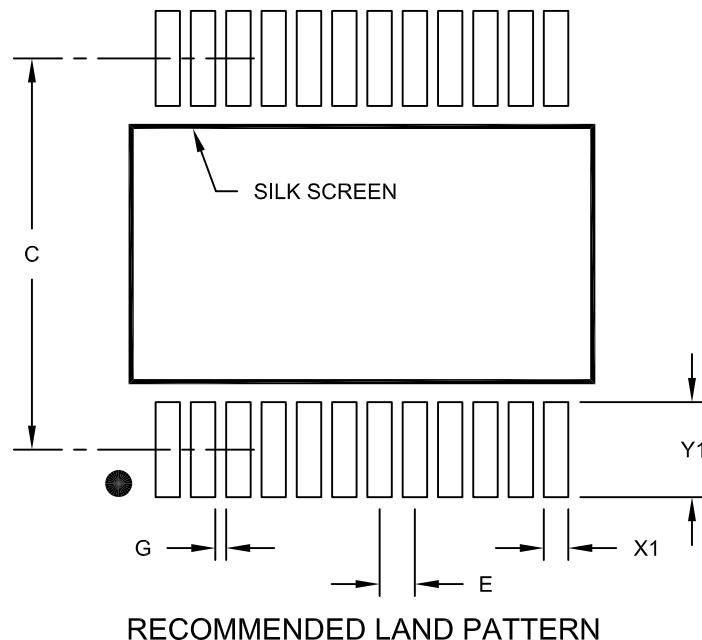
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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>



| Dimension Limits | Units | MILLIMETERS | | |
|--------------------------|-------|-------------|----------|------|
| | | MIN | NOM | MAX |
| Contact Pitch | E | | 0.65 BSC | |
| Contact Pad Spacing | C | | 7.20 | |
| Contact Pad Width (X24) | X1 | | | 0.45 |
| Contact Pad Length (X24) | Y1 | | | 1.75 |
| Distance Between Pads | G | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

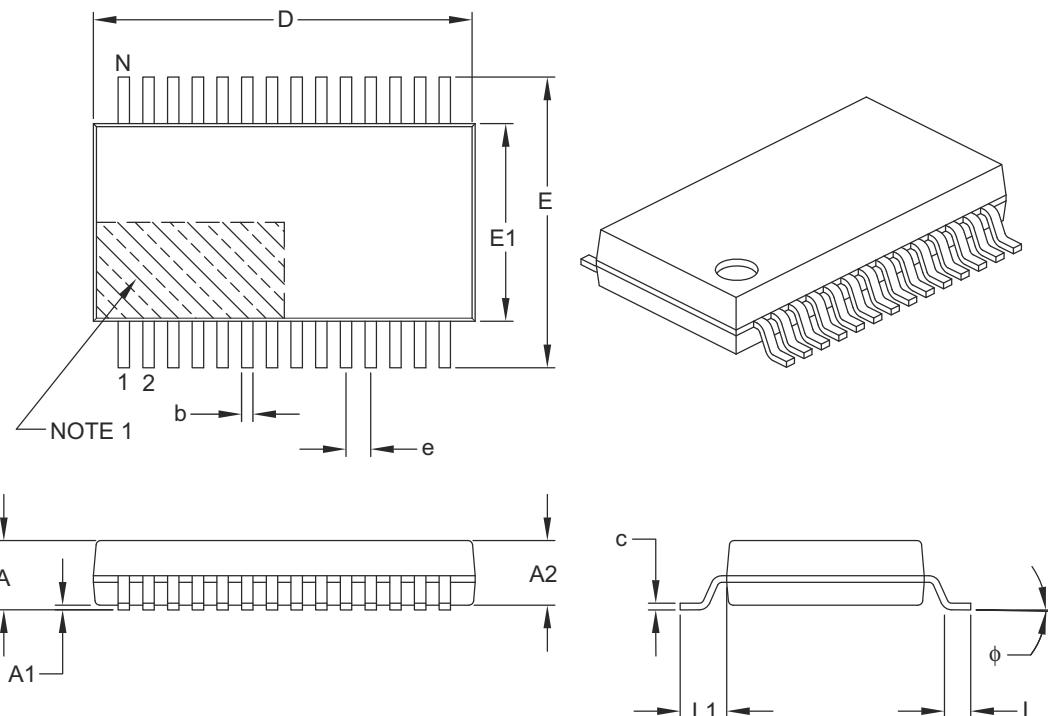
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2132A

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 | | 28 | | |
| Pitch | | 0.65 BSC | | |
| Overall Height | | A | — | 2.00 |
| Molded Package Thickness | | A2 | 1.65 | 1.75 |
| Standoff | | A1 | 0.05 | — |
| Overall Width | | E | 7.40 | 7.80 |
| Molded Package Width | | E1 | 5.00 | 5.30 |
| Overall Length | | D | 9.90 | 10.20 |
| Foot Length | | L | 0.55 | 0.75 |
| Footprint | | L1 | 1.25 REF | |
| Lead Thickness | | c | 0.09 | — |
| Foot Angle | | φ | 0° | 4° |
| Lead Width | | b | — | 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.

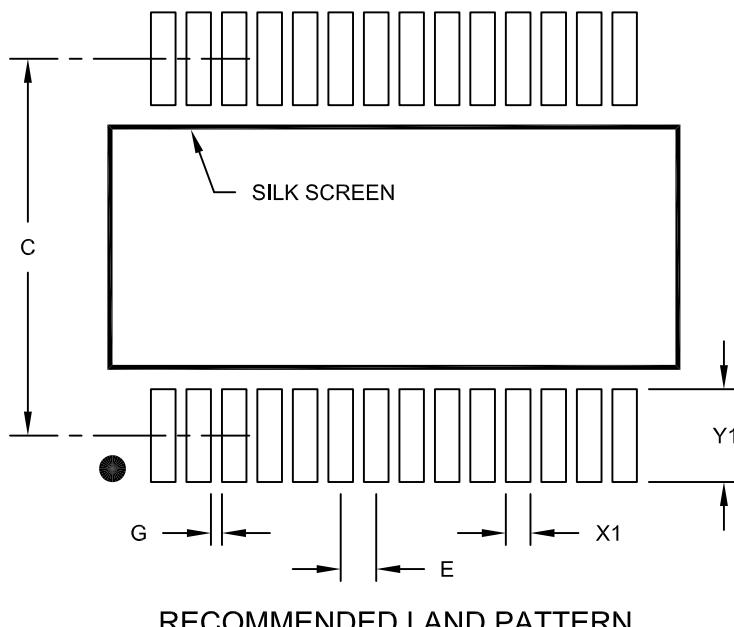
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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 |
| Contact Pitch | | E | | | 0.65 BSC | | |
| Contact Pad Spacing | | C | | | 7.20 | | |
| Contact Pad Width (X28) | | X1 | | | 0.45 | | |
| Contact Pad Length (X28) | | Y1 | | | 1.75 | | |
| 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. C04-2073A



MICROCHIP

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

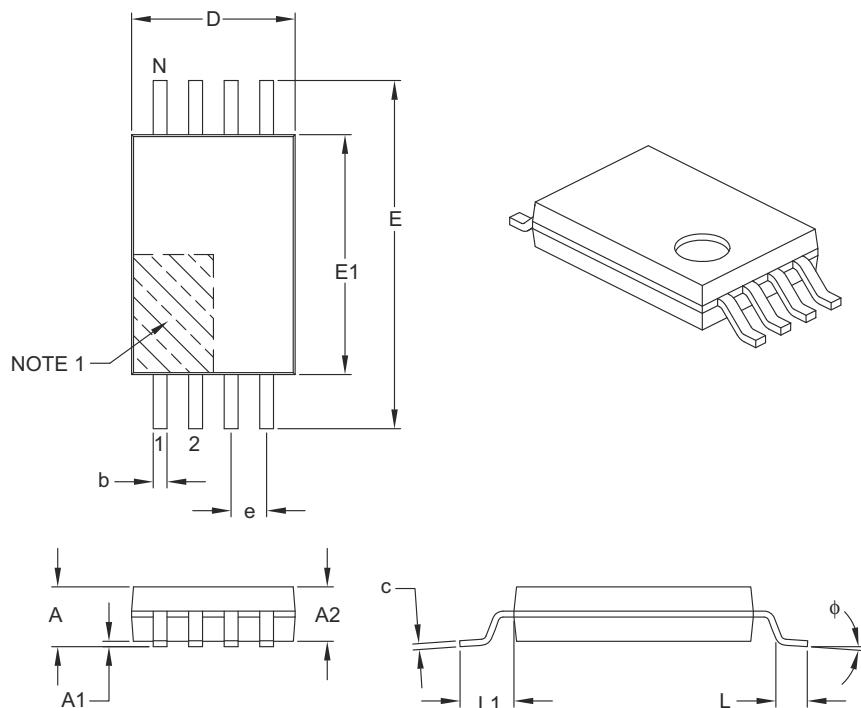
TSSOP Family

Thin Shrink Small Outline Packages

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 | | |
| Pitch | | e | | |
| Overall Height | | A | | |
| Molded Package Thickness | | A2 | | |
| Standoff | | A1 | | |
| Overall Width | | E | | |
| Molded Package Width | | E1 | | |
| Molded Package Length | | D | | |
| Foot Length | | L | | |
| Footprint | | L1 | | |
| Foot Angle | | ϕ | | |
| Lead Thickness | | c | | |
| Lead Width | | b | | |

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.

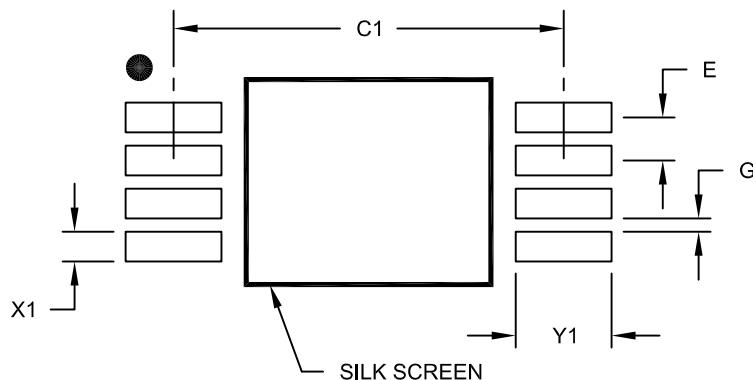
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| | | Units | | | MILLIMETERS | | |
|-------------------------|----|------------------|--|------|-------------|------|-----|
| | | Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | E | 0.65 BSC | | | | | |
| Contact Pad Spacing | C1 | | | 5.90 | | | |
| Contact Pad Width (X8) | X1 | | | | 0.45 | | |
| Contact Pad Length (X8) | Y1 | | | | | 1.45 | |
| Distance Between Pads | G | 0.20 | | | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

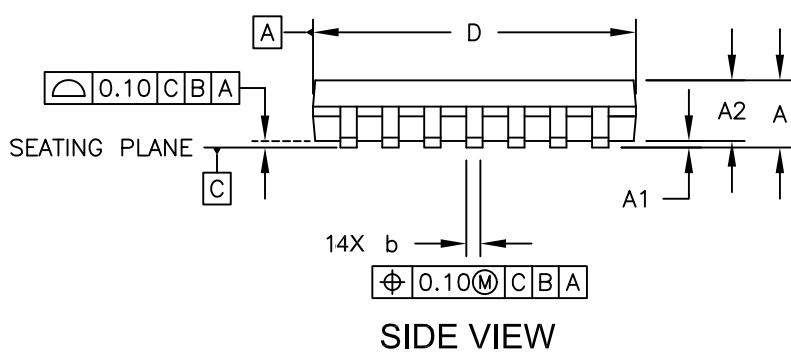
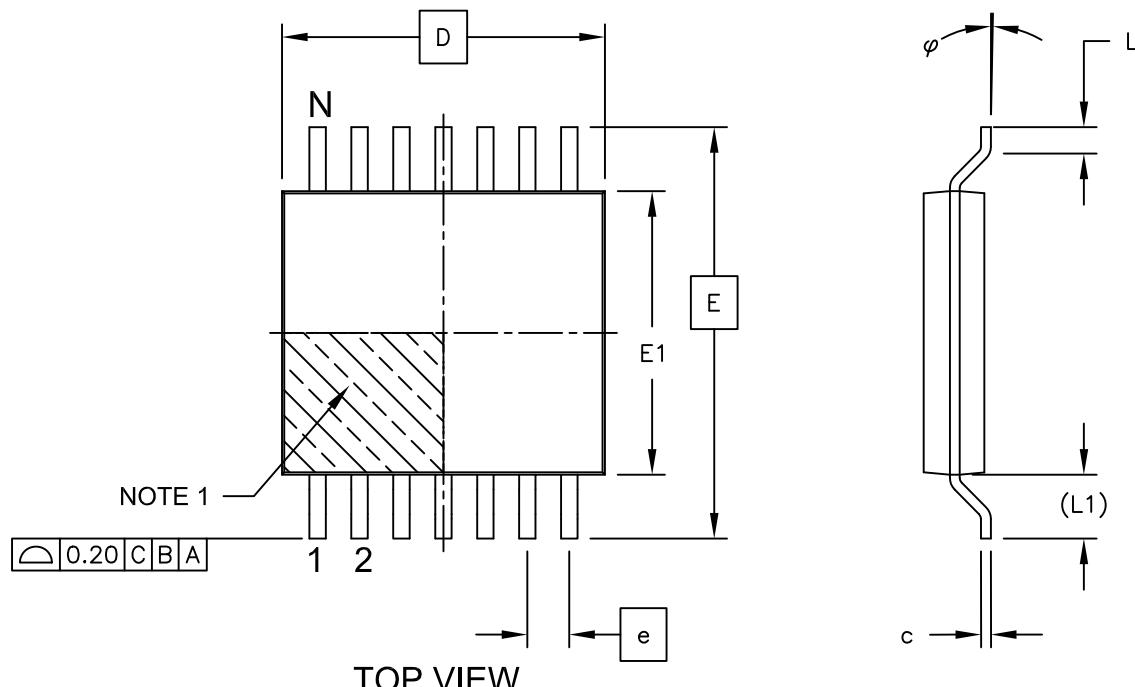
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2086A

Packaging Diagrams and Parameters

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

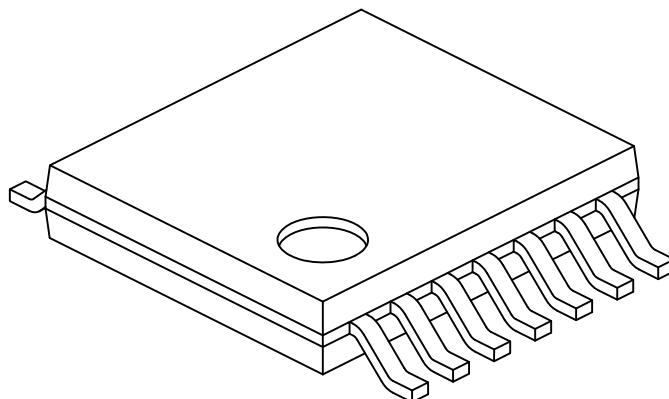
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



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 | 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 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M

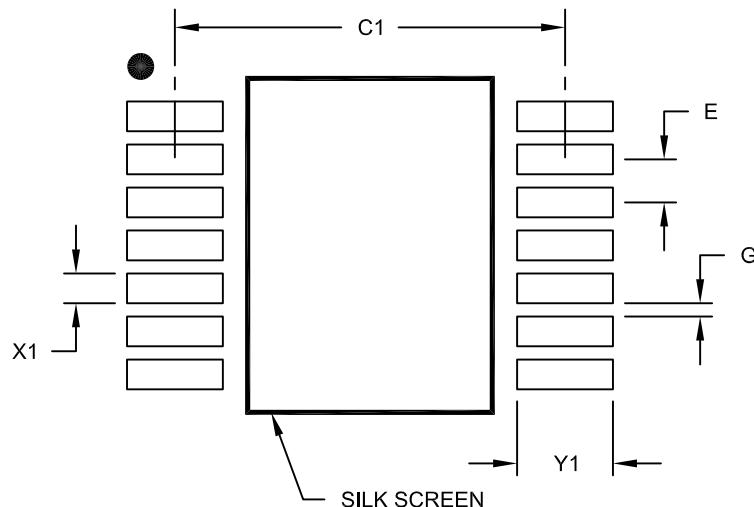
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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>



RECOMMENDED LAND PATTERN

| | | Units | | | MILLIMETERS | | |
|--------------------------|--|------------------|--|--|-------------|-----|-----|
| | | Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | | E | | | 0.65 BSC | | |
| Contact Pad Spacing | | C1 | | | 5.90 | | |
| Contact Pad Width (X14) | | X1 | | | 0.45 | | |
| Contact Pad Length (X14) | | Y1 | | | 1.45 | | |
| Distance Between Pads | | G | | | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

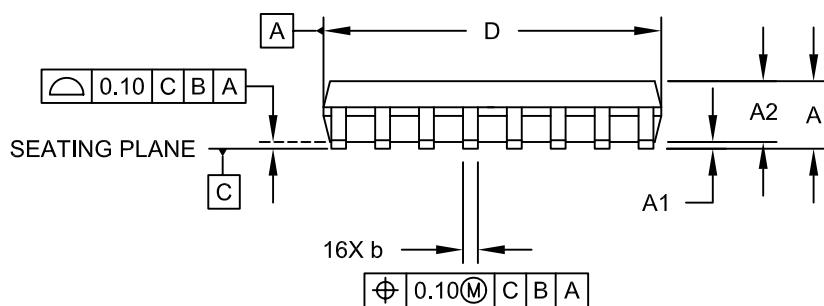
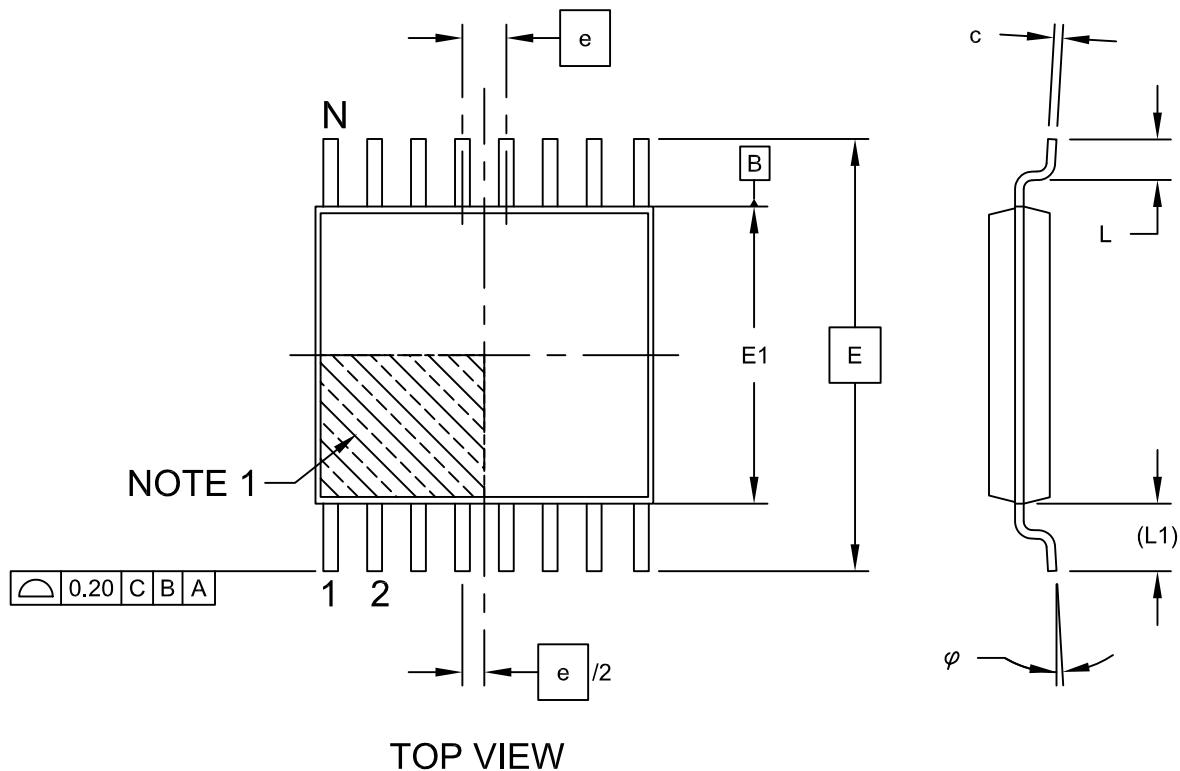
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2087A

Packaging Diagrams and Parameters

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

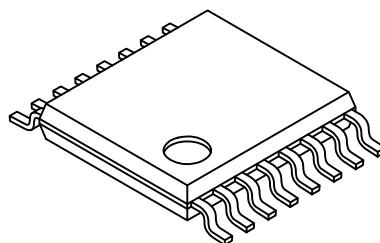
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

16-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 | | 16 | | |
| 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 | 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 0.15mm per side.
3. Dimensioning and tolerancing per ASME Y14.5M

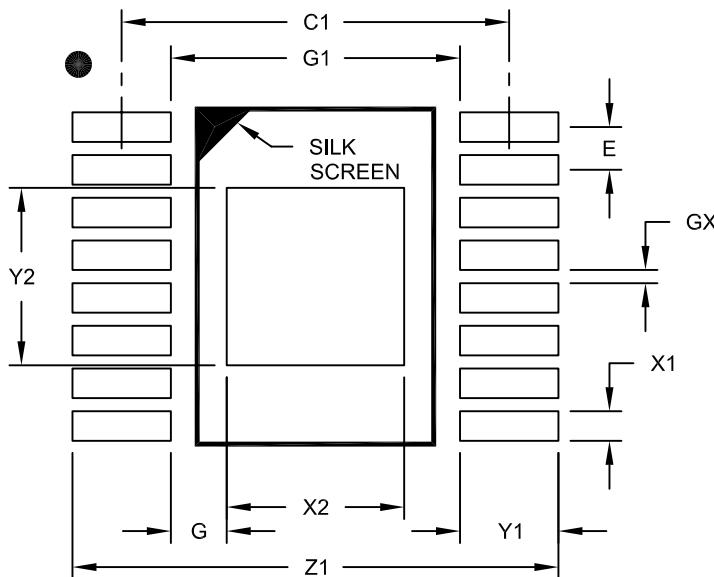
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

16-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>



RECOMMENDED LAND PATTERN

| | | Units | MILLIMETERS | | |
|--------------------------------|----|-------|-------------|------|------|
| Dimension Limits | | | MIN | NOM | MAX |
| Contact Pitch | E | | 0.65 | BSC | |
| Optional Center Pad Length | Y2 | | | | 2.70 |
| Optional Center Pad Width | X2 | | | | 2.70 |
| Clearance Between Contact Pads | G1 | 4.40 | | | |
| Contact Pad To Center Pad | G | 0.73 | | | |
| Contact Pad Spacing | C1 | | 5.90 | | |
| Contact Pad Width (X16) | X1 | | | 0.45 | |
| Contact Pad Length (X16) | Y1 | | | | 1.50 |
| Distance Between Pads | GX | 0.20 | | | |
| Overall Width | Z1 | | | | 7.40 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

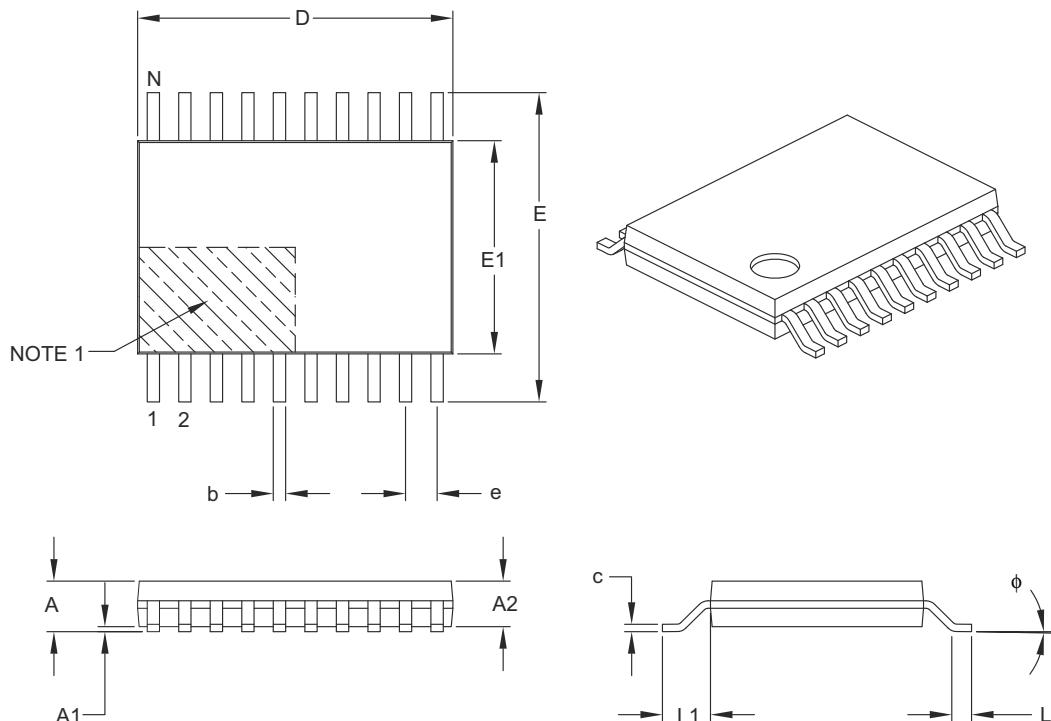
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2068A

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>



| Units | | MILLIMETERS | | |
|--------------------------|-----|-------------|----------|------|
| Dimension Limits | | 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 | 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.

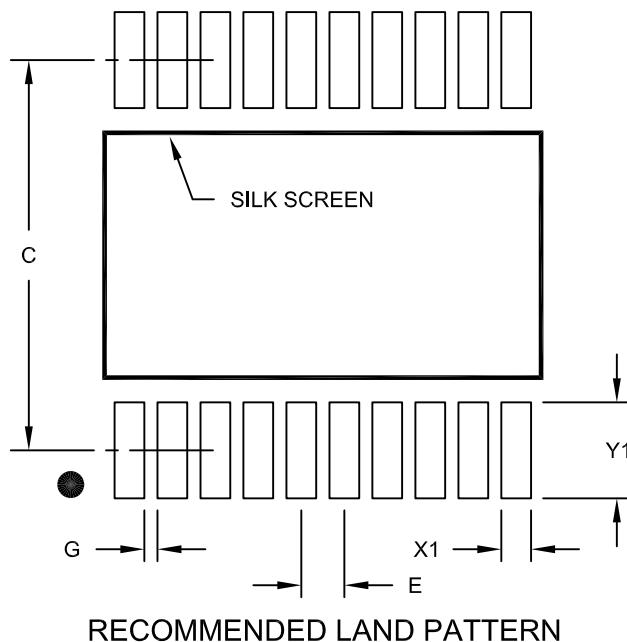
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

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>



| | | Units | MILLIMETERS | | |
|--------------------------|----|------------------|-------------|------|------|
| | | Dimension Limits | MIN | NOM | MAX |
| Contact Pitch | E | | 0.65 | BSC | |
| Contact Pad Spacing | C | | 5.90 | | |
| Contact Pad Width (X20) | X1 | | | 0.45 | |
| Contact Pad Length (X20) | Y1 | | | | 1.45 |
| 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. C04-2088A



MICROCHIP

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

TSOP Family

Thin Small Outline Package

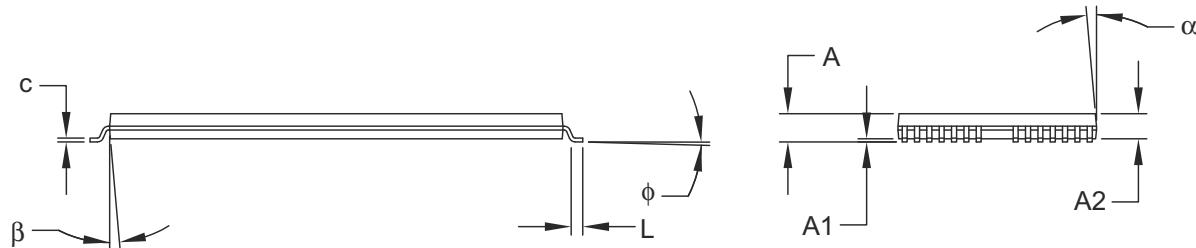
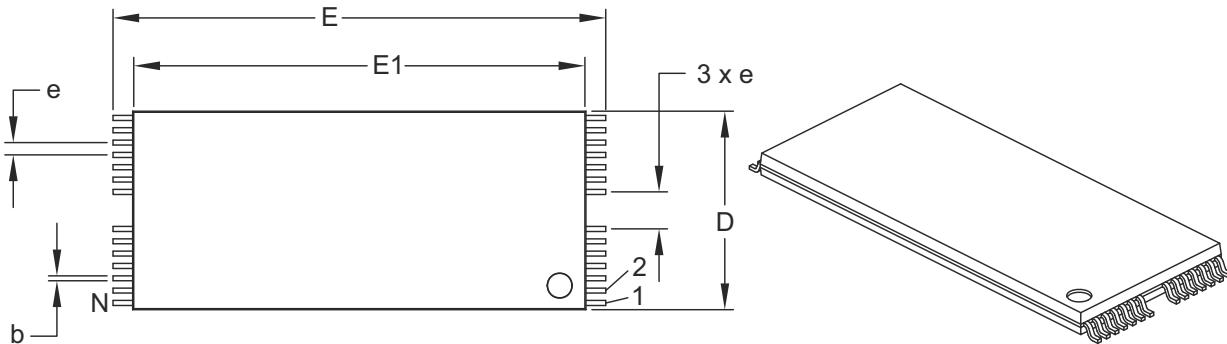
VSOP Family

Very Small Outline Package

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° |

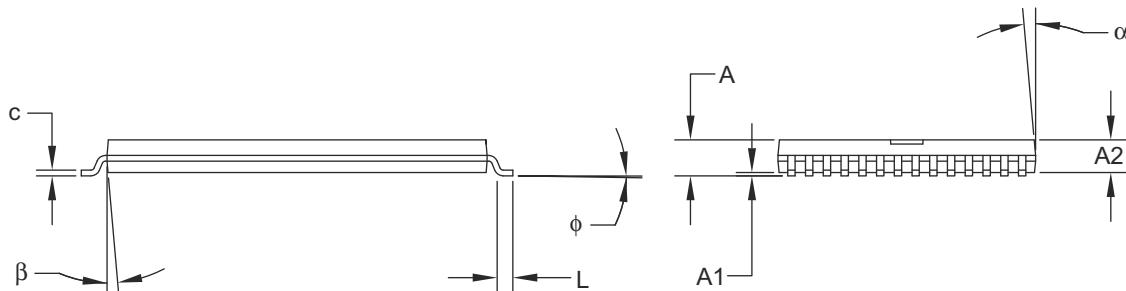
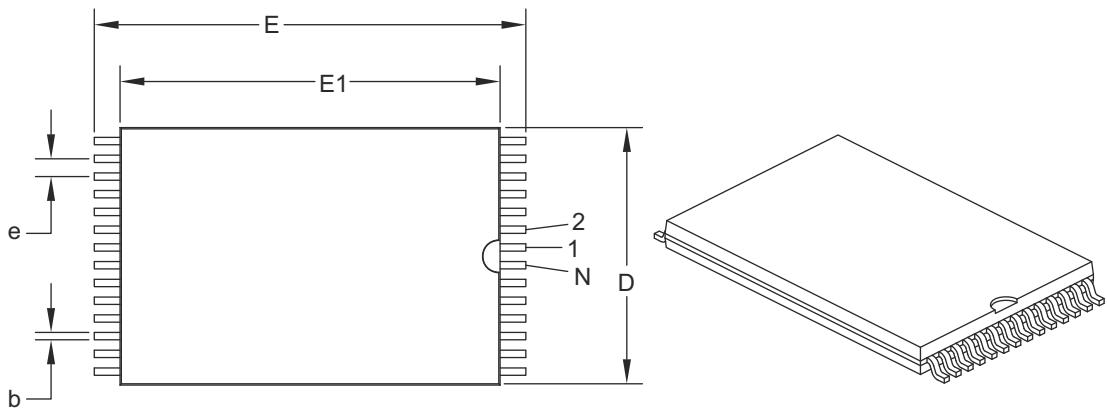
Notes:

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. § 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>



| | Dimension Limits | Units MILLIMETERS | | |
|--------------------------|------------------|-------------------|-------|-------|
| | | 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

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

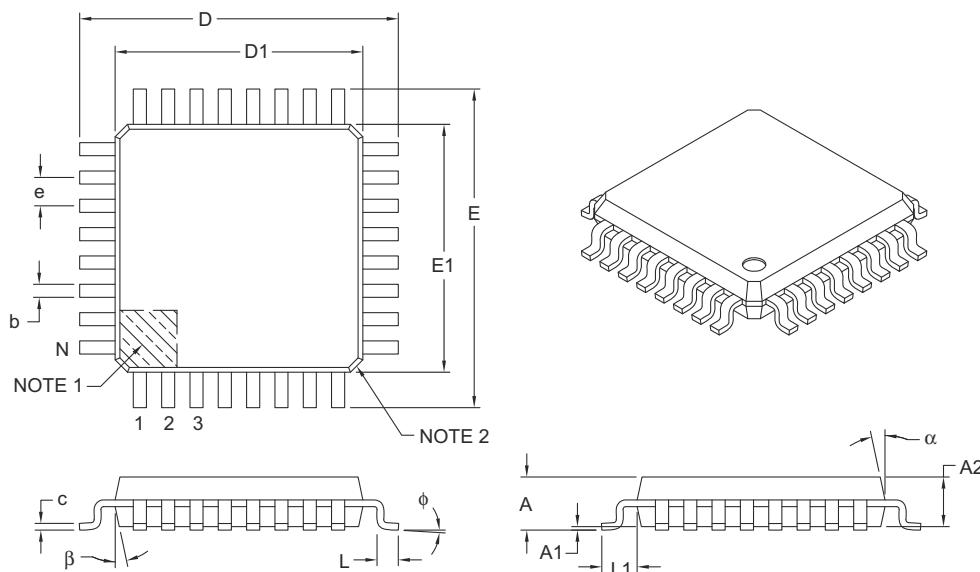
LQFP Family

Low Profile Quad Flat Packages

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:

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.

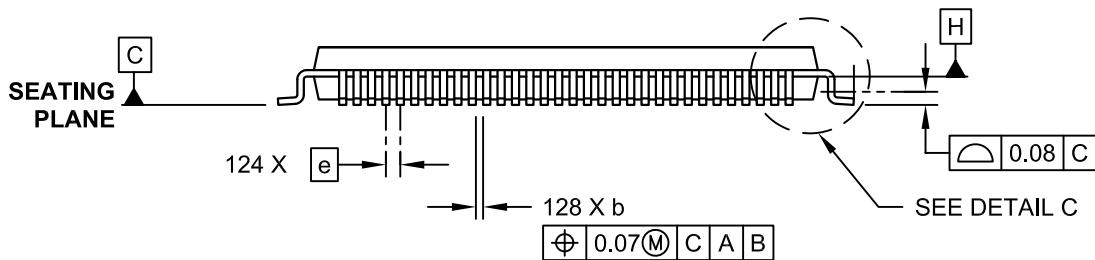
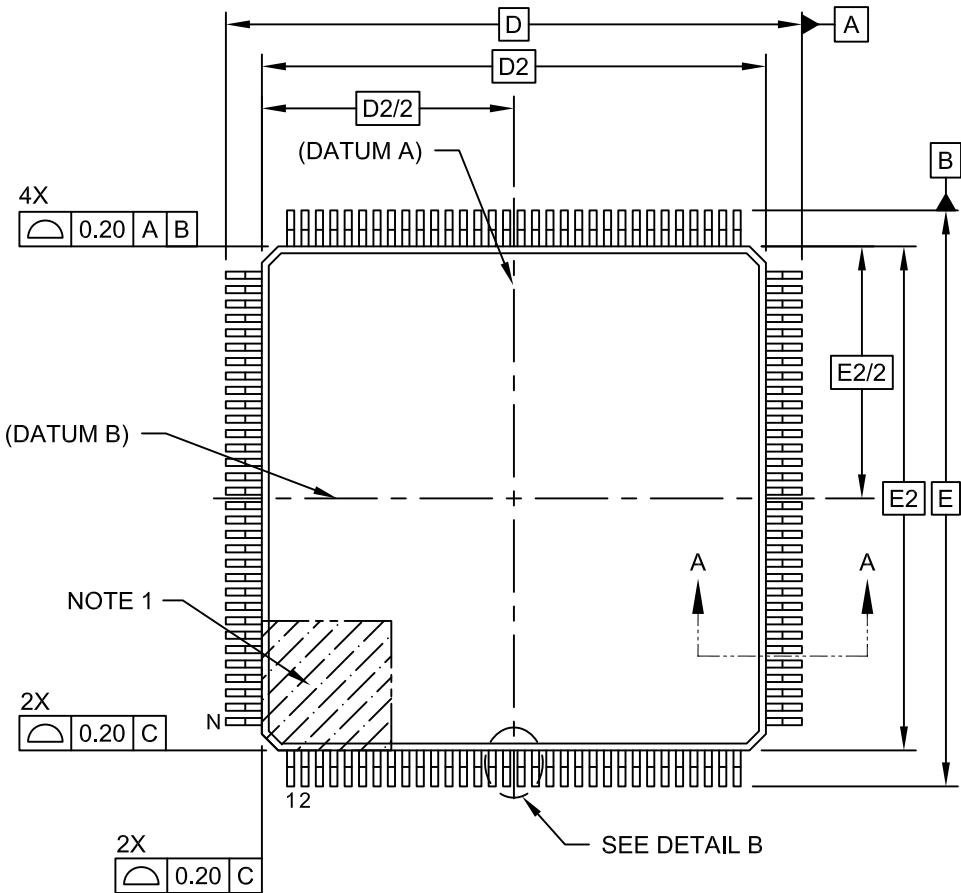
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

128-Lead Low Profile Plastic Quad Flat Pack (PT) – 14x14x1.4 mm Body [LQFP]

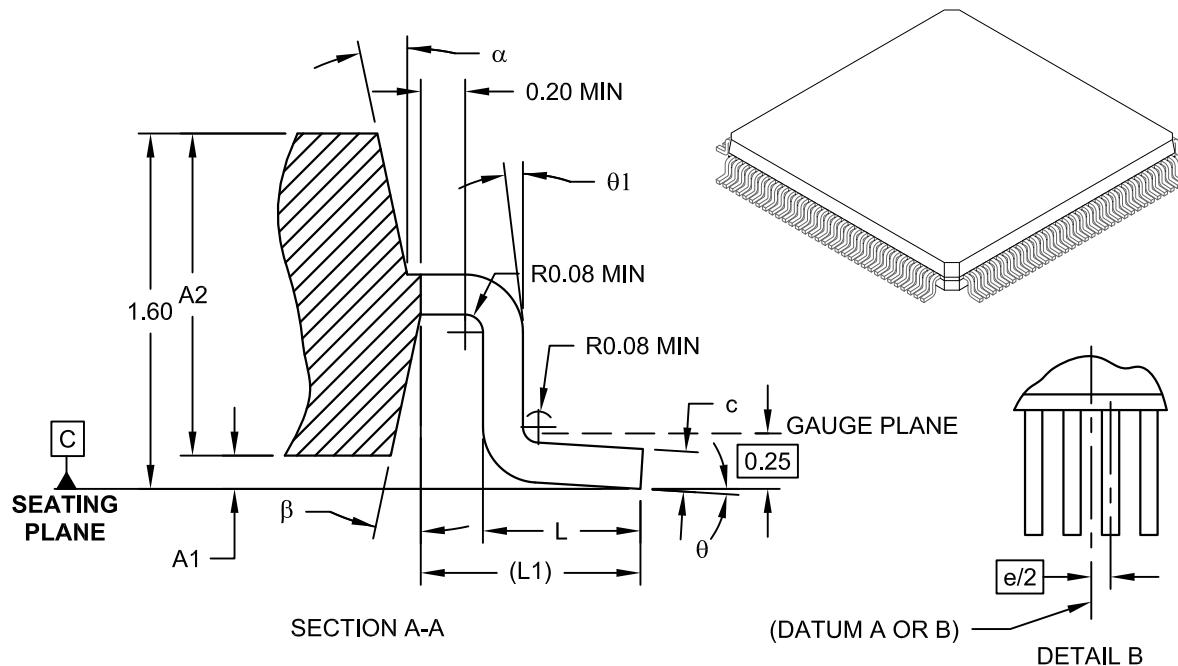
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

128-Lead Low Profile Plastic Quad Flat Pack (PT) – 14x14x1.4 mm Body [LQFP]

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 | 128 | | |
| Pitch | e | 0.40 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 | | |
| Lead Angle | θ | 0° | - | - |
| Foot Angle | θ_1 | 0° | 3.5° | 7° |
| Overall Width | D | 16.00 BSC | | |
| Overall Length | E | 16.00 BSC | | |
| Molded Body Width | D1 | 14.00 BSC | | |
| Molded Body Length | E1 | 14.00 BSC | | |
| Lead Thickness | c | 0.09 | - | 0.20 |
| Foot Angle | θ | 0° | - | - |
| 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. Exact shape at each corner may vary.
3. Dimensioning and tolerancing per ASME Y14.5M.

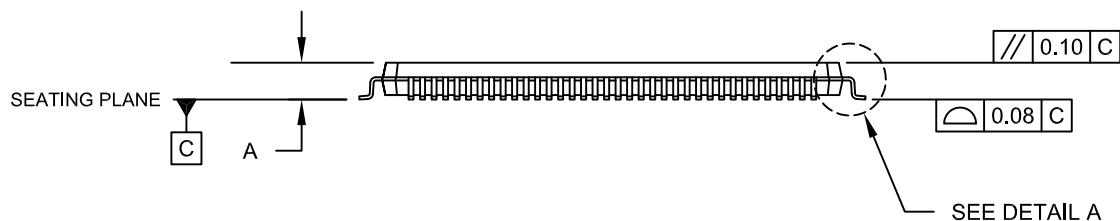
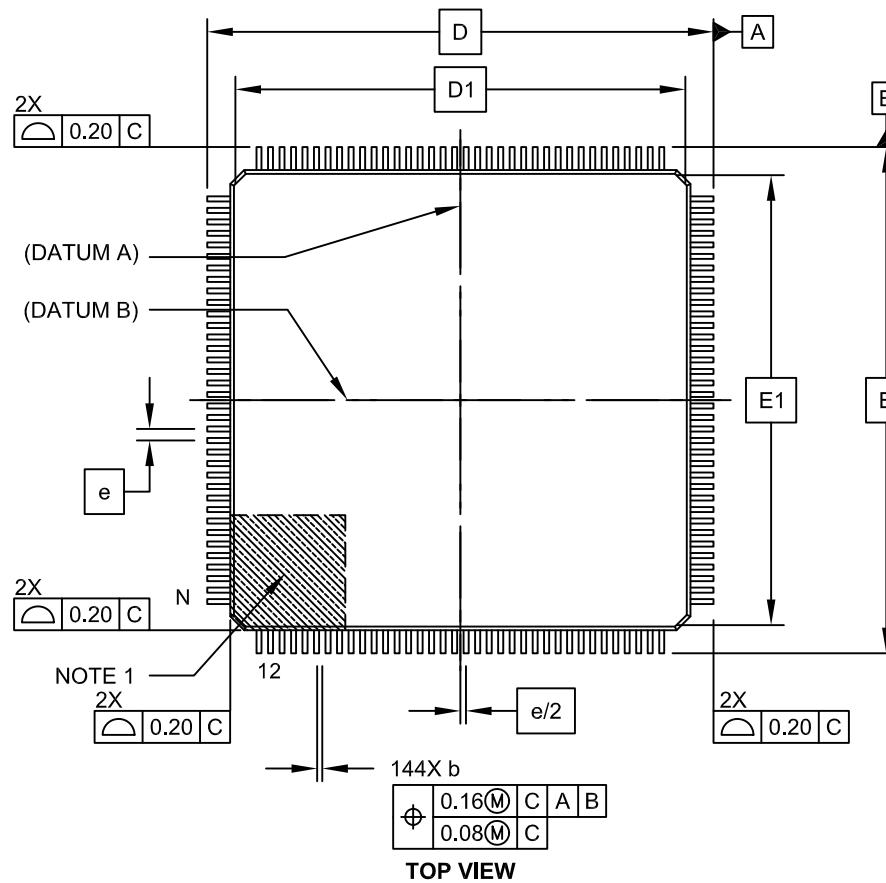
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

144-Lead Plastic Low Profile Quad Flatpack (PL) – 20x20x1.40 mm Body, with 2.00 mm Footprint [LQFP]

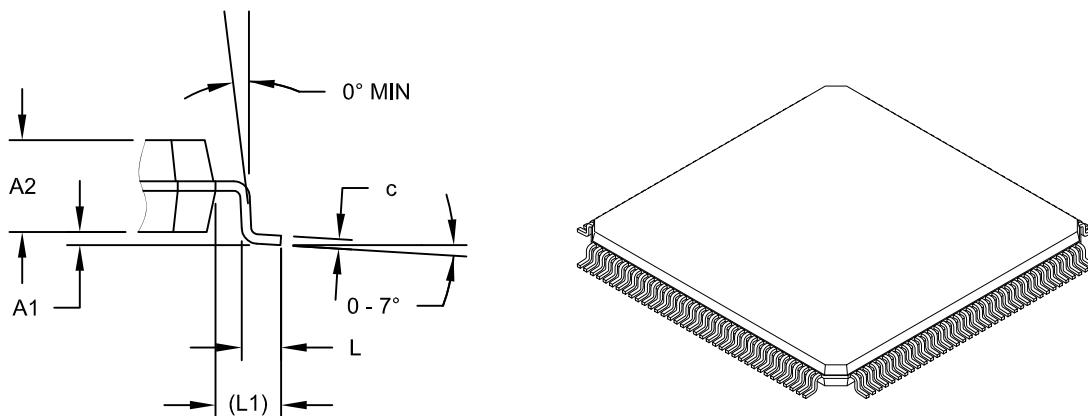
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

144-Lead Plastic Low Profile Quad Flatpack (PL) – 20x20x1.40 mm Body, with 2.00 mm Footprint [LQFP]

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



DETAIL A

| | Units | MILLIMETERS | | |
|-----------------------|------------------|-------------|----------|------|
| | Dimension Limits | MIN | NOM | MAX |
| Number of Leads | N | | 144 | |
| Lead Pitch | e | | 0.50 BSC | |
| Overall Height | A | - | - | 1.60 |
| Molded Package Height | 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) | | |
| Overall Width | E | 22.00 BSC | | |
| Overall Length | D | 22.00 BSC | | |
| Molded Body Width | E1 | 20.00 BSC | | |
| Molded Body Length | D1 | 20.00 BSC | | |
| Lead Thickness | c | 0.09 | - | 0.20 |
| Lead Width | b | 0.17 | 0.22 | 0.27 |

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.

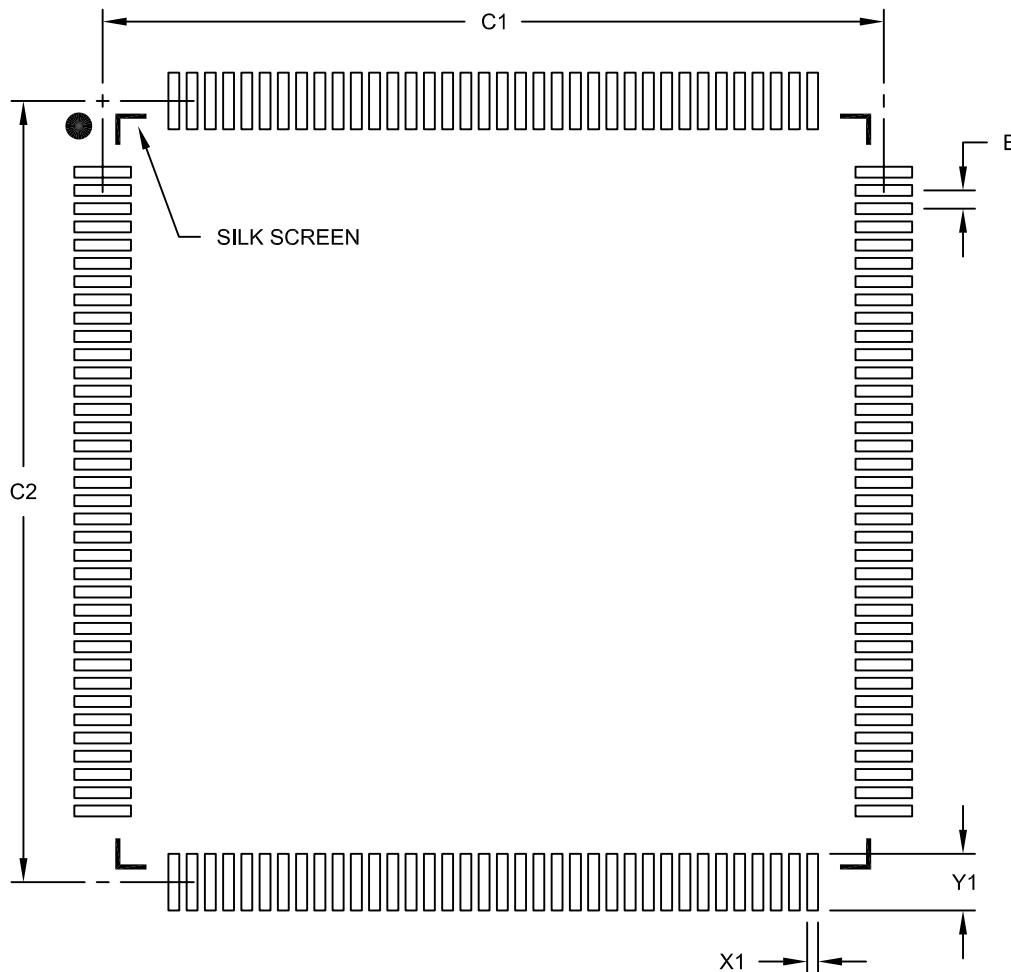
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

144-Lead Plastic Low Profile Quad Flatpack (PL) - 20x20x1.40 mm Body [LQFP]
 2.00 mm Footprint

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 | | | 21.40 | |
| Contact Pad Spacing | C2 | | | 21.40 | |
| Contact Pad Width (X144) | X1 | | | | 0.30 |
| Contact Pad Length (X144) | 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. C04-2044B



MICROCHIP

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

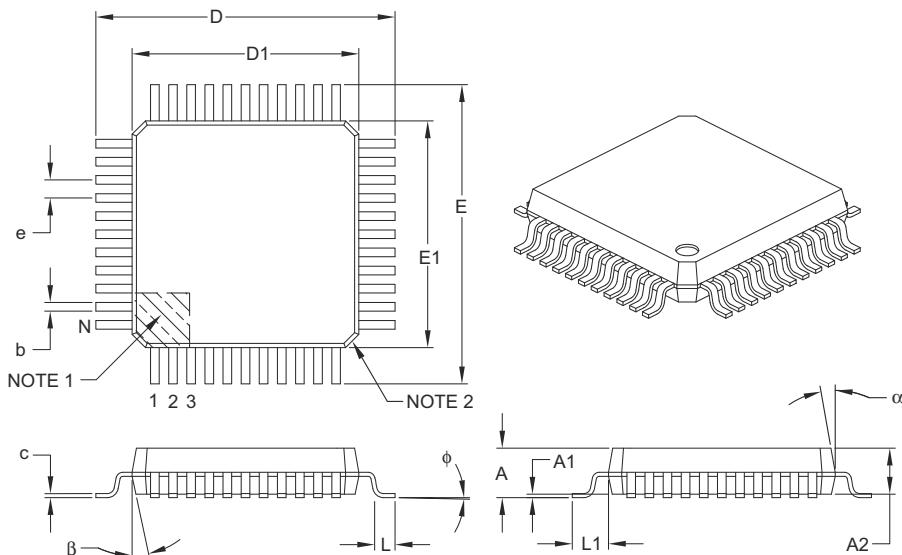
MQFP Family

Metric Quad Flat Packages

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.

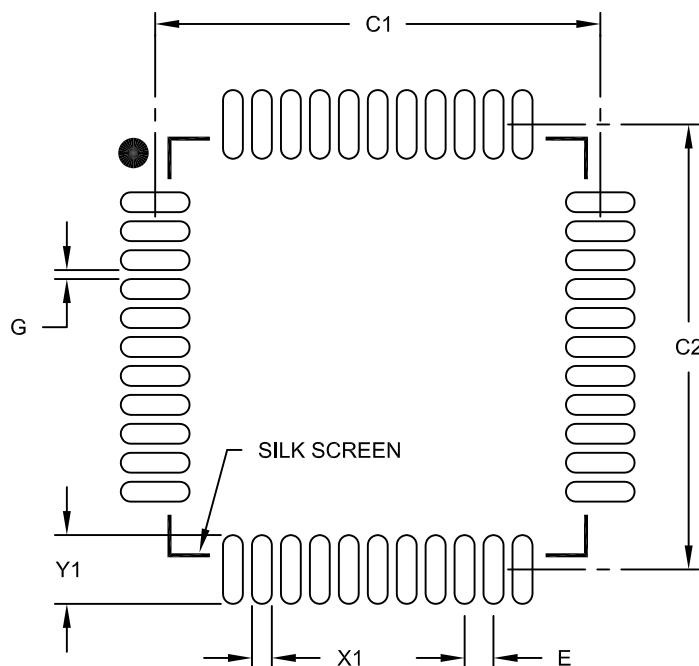
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. § Significant Characteristic.

Land Pattern (Footprint)

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

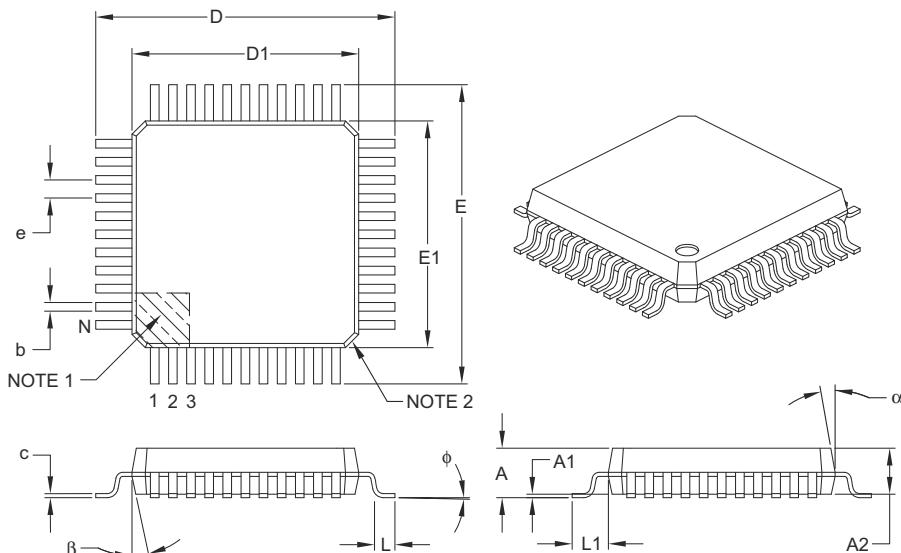
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2071B

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>



| Units | | MILLIMETERS | | |
|--------------------------|--|-------------|-----|-----|
| Dimension Limits | | MIN | NOM | MAX |
| Number of Leads | | N | | |
| Lead Pitch | | e | | |
| Overall Height | | A | | |
| Molded Package Thickness | | A2 | | |
| Standoff § | | A1 | | |
| Foot Length | | L | | |
| Footprint | | L1 | | |
| Foot Angle | | ϕ | | |
| Overall Width | | E | | |
| Overall Length | | D | | |
| Molded Package Width | | E1 | | |
| Molded Package Length | | D1 | | |
| 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. 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.

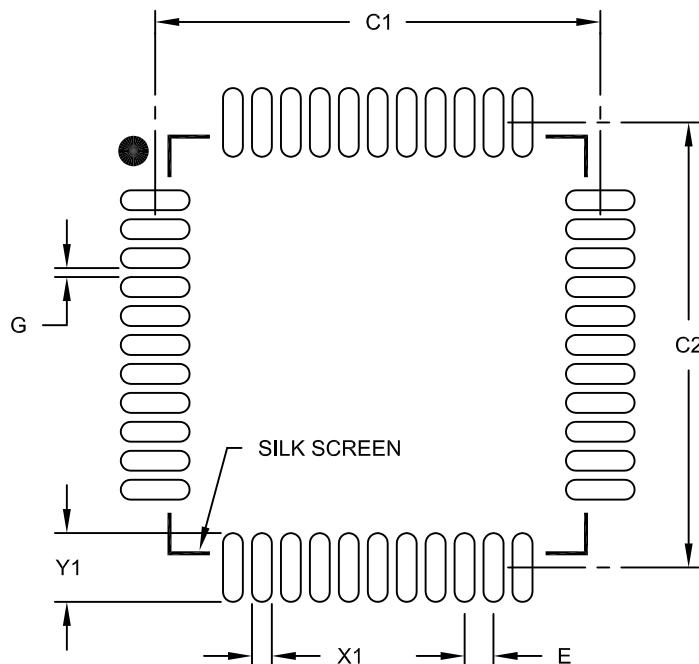
REF: Reference Dimension, usually without tolerance, for information purposes only.

5. § Significant Characteristic.

Land Pattern (Footprint)

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

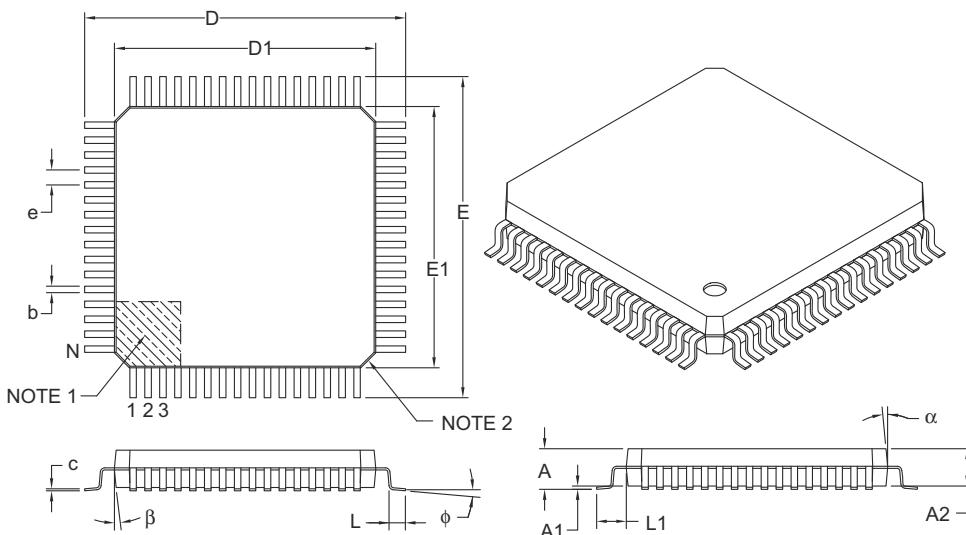
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2071B

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 | | 64 | | |
| Lead Pitch | | 0.80 BSC | | |
| Overall Height | | A | | |
| Molded Package Thickness | | A2 | 2.50 | 2.70 |
| Standoff § | | A1 | 0.00 | – |
| 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 |
| Footprint | | L1 | 1.60 REF | |
| Foot Angle | | ϕ | 0° | – |
| Lead Thickness | | c | 0.11 | – |
| Lead Width | | b | 0.29 | – |
| Mold Draft Angle Top | | α | 5° | – |
| 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.

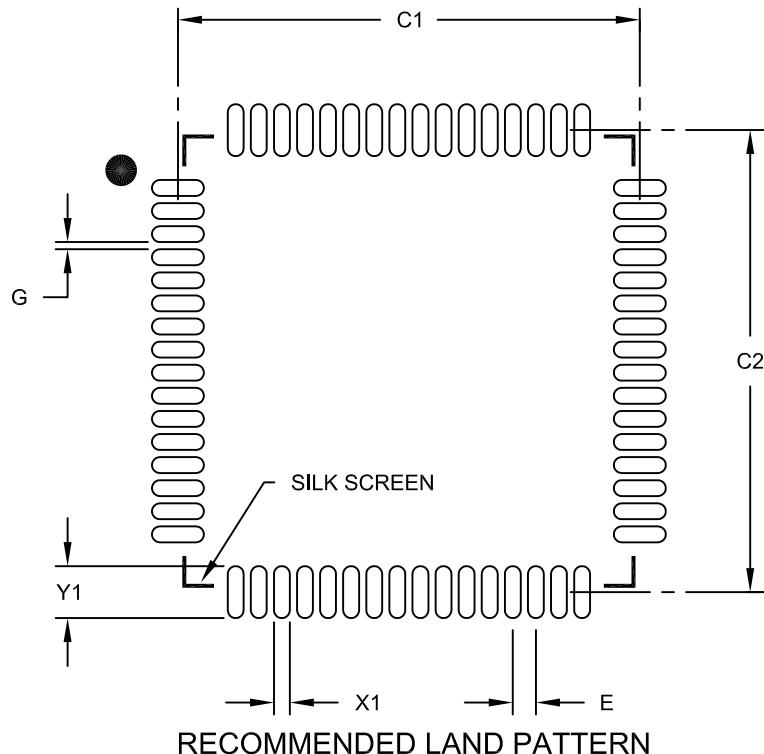
5. § Significant Characteristic.

6. Formerly TelCom PQFP package.

Land Pattern (Footprint)

64-Lead Plastic Metric Quad FlatPack (BU) - 14x14x2.7 mm Body 3.20 mm Footprint [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

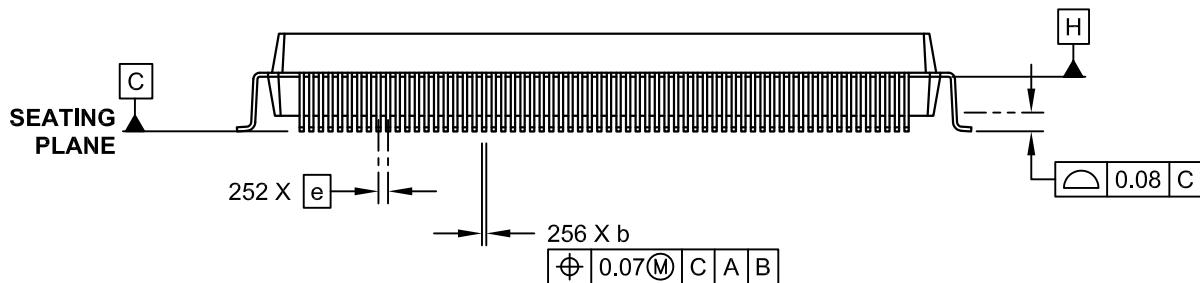
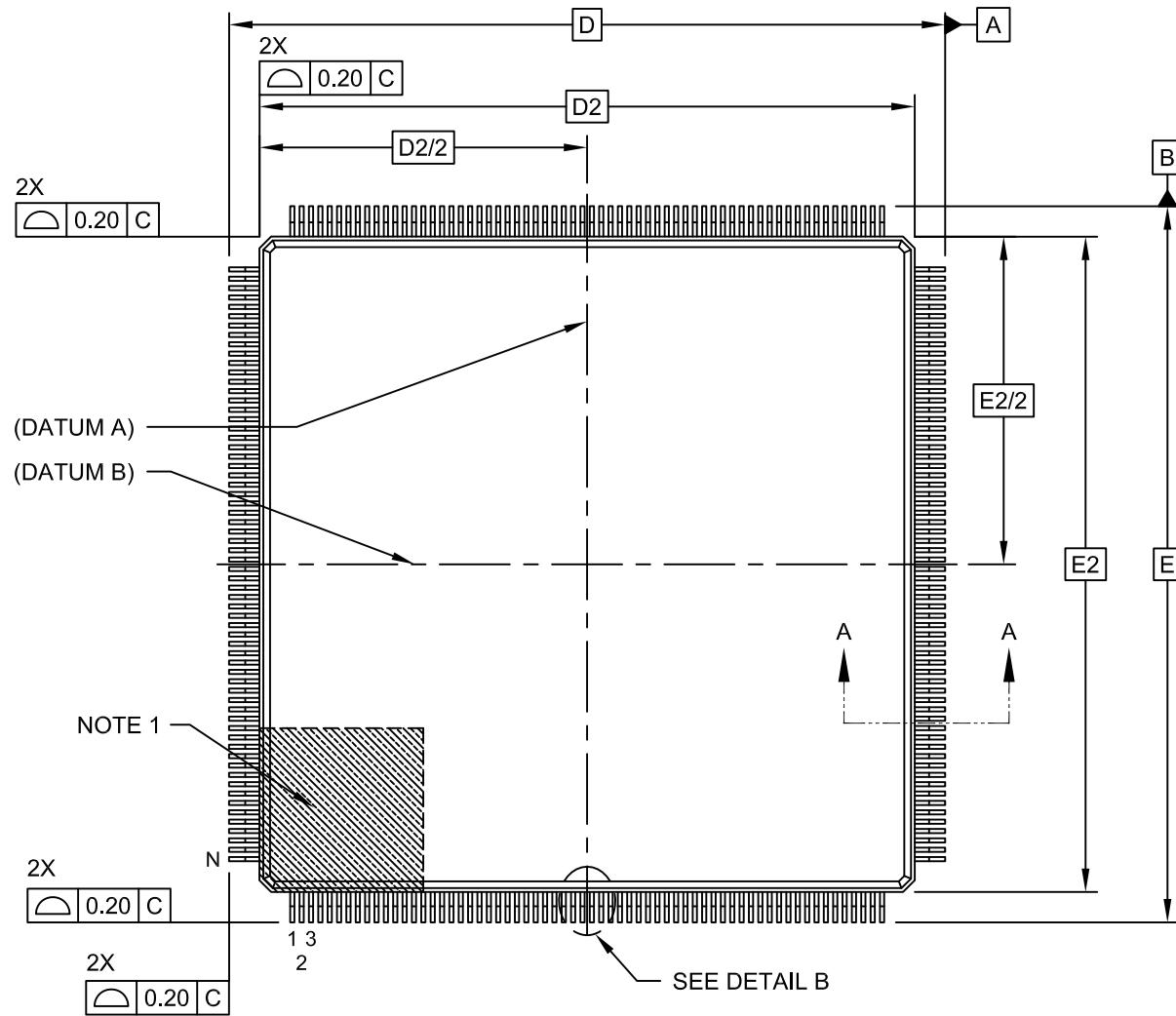
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2022B

Packaging Diagrams and Parameters

256-Lead Plastic Metric Quat Flatpack (PQ) - 28x28x3.40 mm Body [MQFP] 2.60 mm Footprint

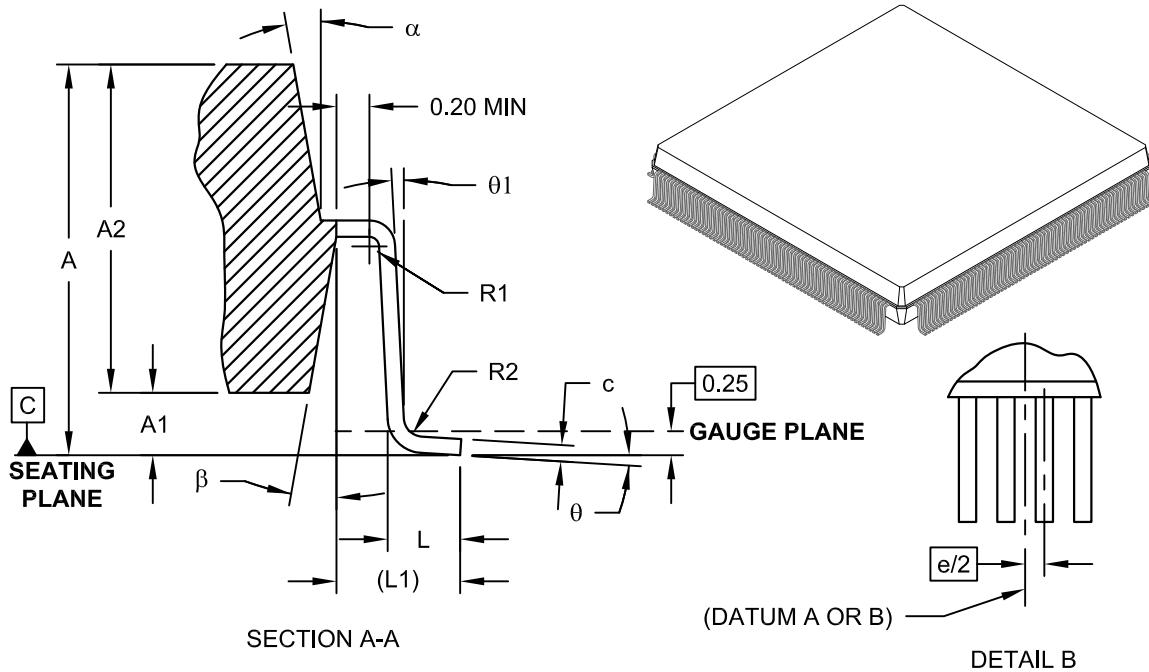
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

256-Lead Plastic Metric Quat Flatpack (PQ) - 28x28x3.40 mm Body [MQFP] 2.60 mm Footprint

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 | 256 | | |
| Lead Pitch | e | 0.40 | BSC | |
| Overall Height | A | - | - | 4.07 |
| Molded Package Height | A2 | 3.20 | 3.40 | 3.60 |
| Standoff | A1 | 0.15 | 0.25 | 0.35 |
| Foot Length | L | 0.45 | 0.60 | 0.75 |
| Footprint | L1 | 1.30 (REF) | | |
| Lead Angle | φ | 0° | 3.5° | 7° |
| Foot Angle | φ1 | 0° | - | - |
| Overall Width | E | 30.60 BSC | | |
| Overall Length | D | 30.60 BSC | | |
| Molded Body Width | E1 | 28.00 BSC | | |
| Molded Body Length | D1 | 28.00 BSC | | |
| Lead Thickness | c | 0.09 | - | 0.20 |
| Lead Width | b | 0.13 | - | 0.23 |
| Bend Radius | R1 | 0.08 | - | - |
| Bend Radius | R2 | 0.25 TYP | | |
| Mold Draft Angle Top | α | 9° | - | 11° |
| Mold Draft Angle Bottom | β | 9° | - | 11° |

Notes:

1. Pin 1 visual index feature may vary, but must be located within the hatched area.
2. 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

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

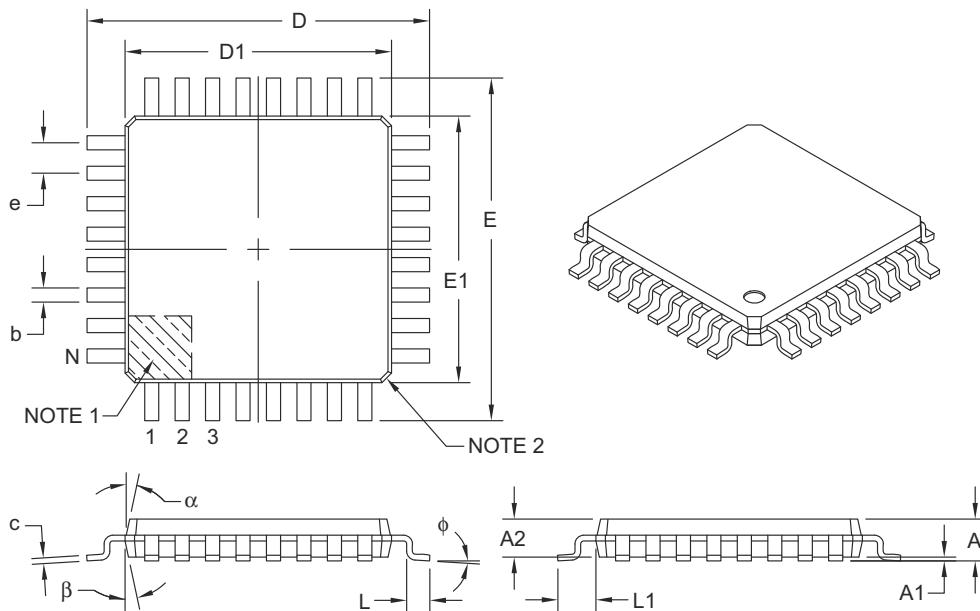
TQFP Family

Thin Quad Flat Packages

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 | | | | 32 | | |
| Lead Pitch | e | | | | 0.80 BSC | | |
| Overall Height | A | | — | — | 1.20 | | |
| Standoff | A1 | | 0.05 | — | 0.15 | | |
| Molded Package Thickness | A2 | | 0.95 | 1.00 | 1.05 | | |
| 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:

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.

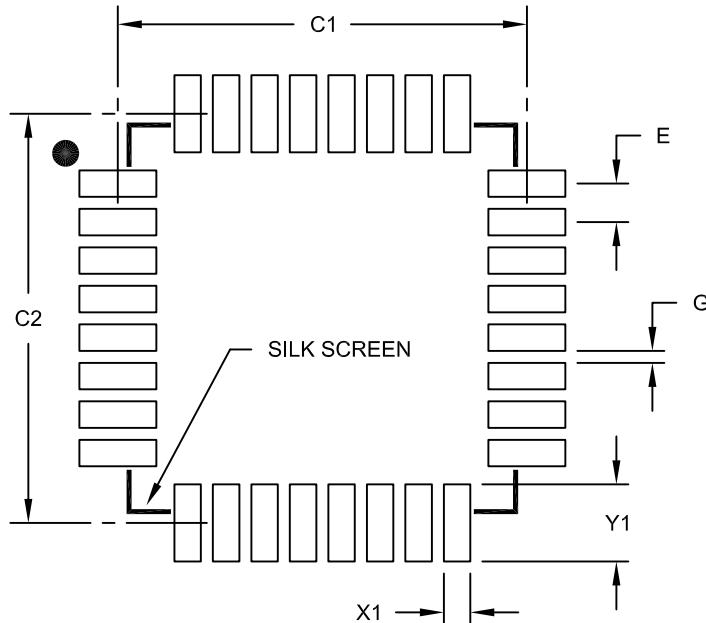
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-074B

Land Pattern (Footprint)

32-Lead Plastic Thin Quad Flatpack (PT) - 7x7x1.0 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>



RECOMMENDED LAND PATTERN

| Units | | MILLIMETERS | | |
|--------------------------|--------|-------------|------|------|
| Dimension | Limits | MIN | NOM | MAX |
| Contact Pitch | E | | 0.80 | BSC |
| Contact Pad Spacing | C1 | | 8.50 | |
| Contact Pad Spacing | C2 | | 8.50 | |
| Contact Pad Width (X28) | X1 | | | 0.55 |
| Contact Pad Length (X28) | Y1 | | | 1.60 |
| Distance Between Pads | G | 0.25 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

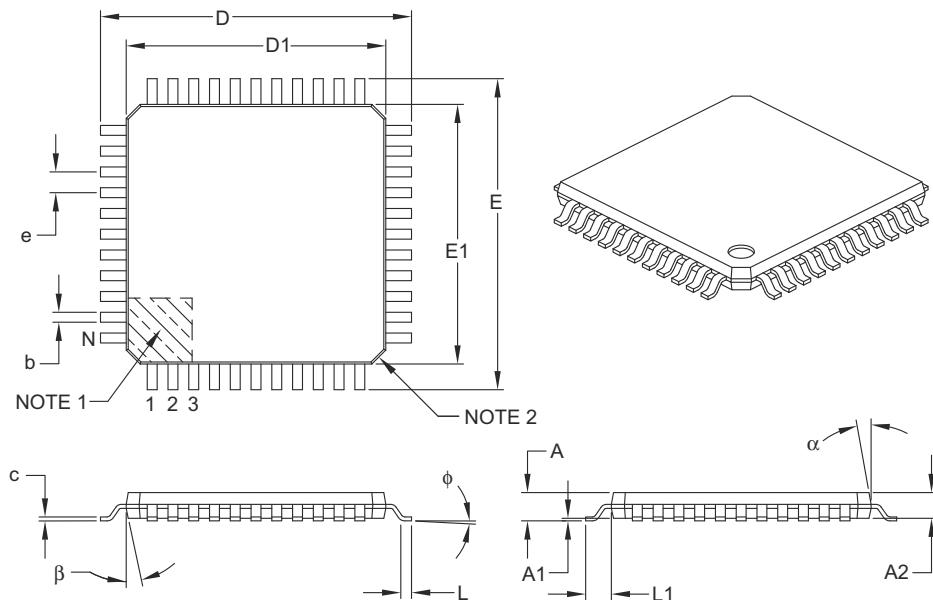
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2074B

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 | | |
| Lead Pitch | | e | | |
| Overall Height | | A | | |
| Molded Package Thickness | | A2 | | |
| Standoff | | A1 | | |
| Foot Length | | L | | |
| Footprint | | L1 | | |
| Foot Angle | | φ | | |
| Overall Width | | E | | |
| Overall Length | | D | | |
| Molded Package Width | | E1 | | |
| Molded Package Length | | D1 | | |
| 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. 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.

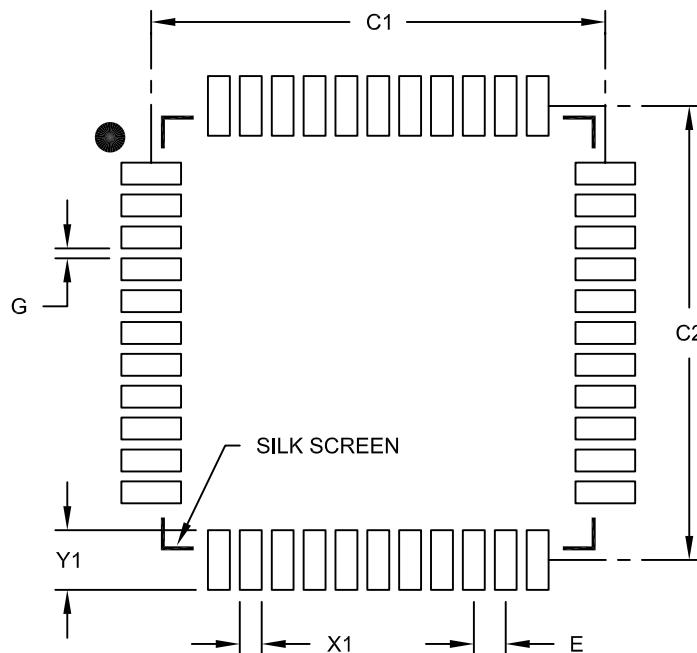
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

44-Lead Plastic Thin Quad Flatpack (PT) 10X10X1 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>



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

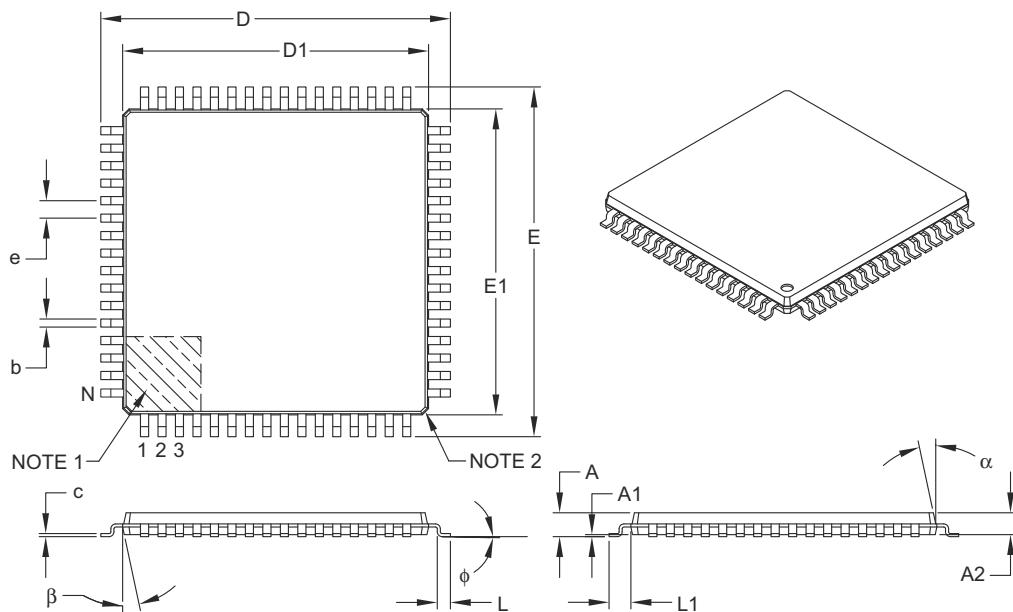
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2076B

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>



| | | Units | MILLIMETERS | | |
|--------------------------|----|-----------|-------------|------|-----|
| Dimension Limits | | | 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 | 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 | 0.30 | 0.37 | 0.45 | |
| 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.

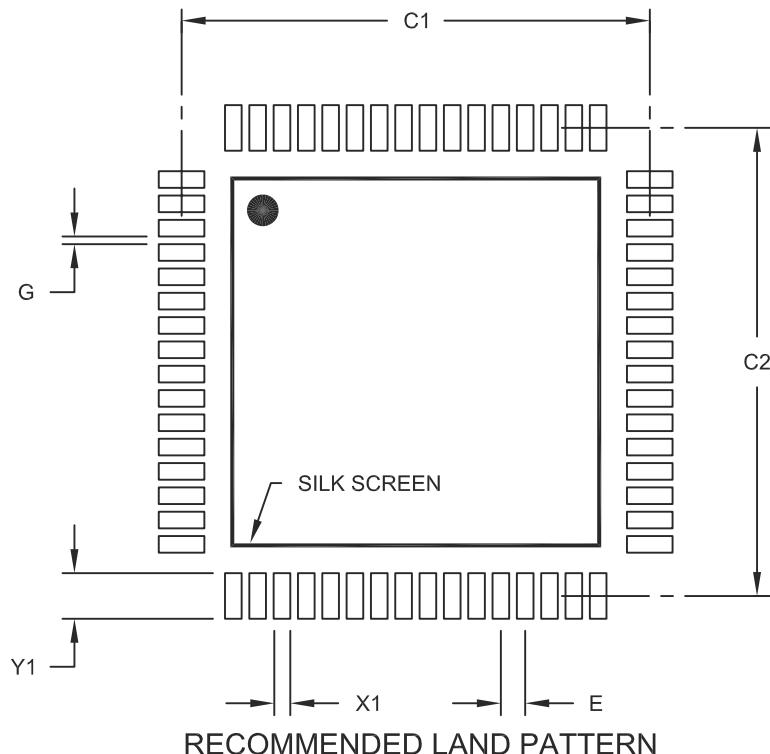
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

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

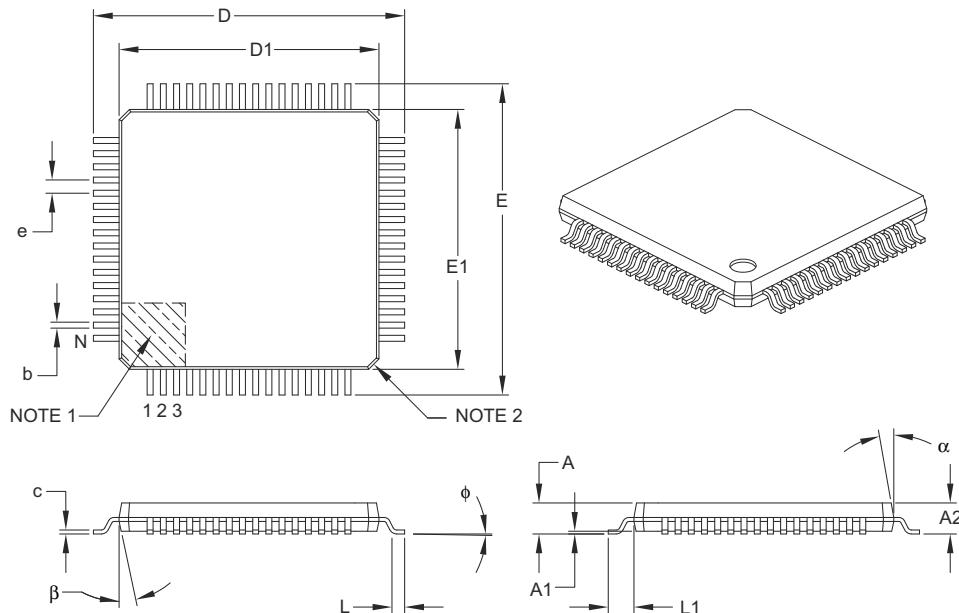
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2066A

Packaging Diagrams and Parameters

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 | | N | 64 | | |
| 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 | 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 | 0.17 | 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.

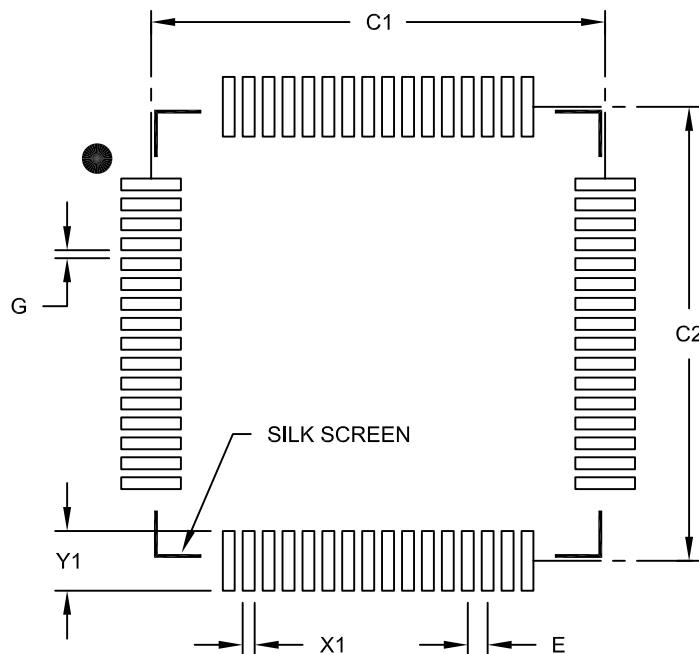
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-085B

Land Pattern (Footprint)

64-Lead Plastic Thin Quad Flatpack (PT) 10x10x1 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>



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

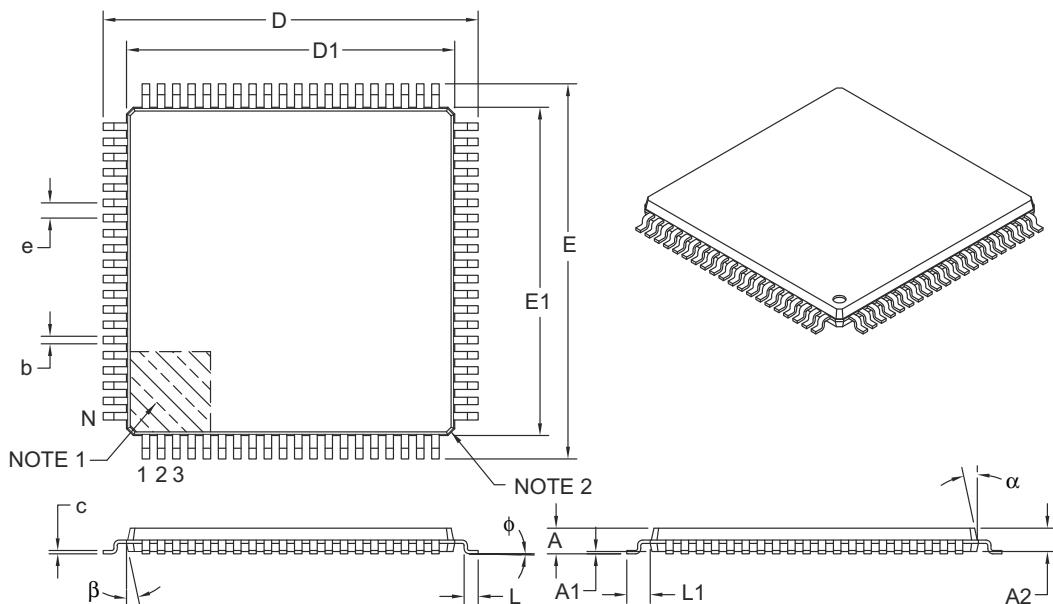
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2085B

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>



| | | Units | MILLIMETERS | | |
|--------------------------|-------|-----------|-------------|------|-----|
| Dimension Limits | | | 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.

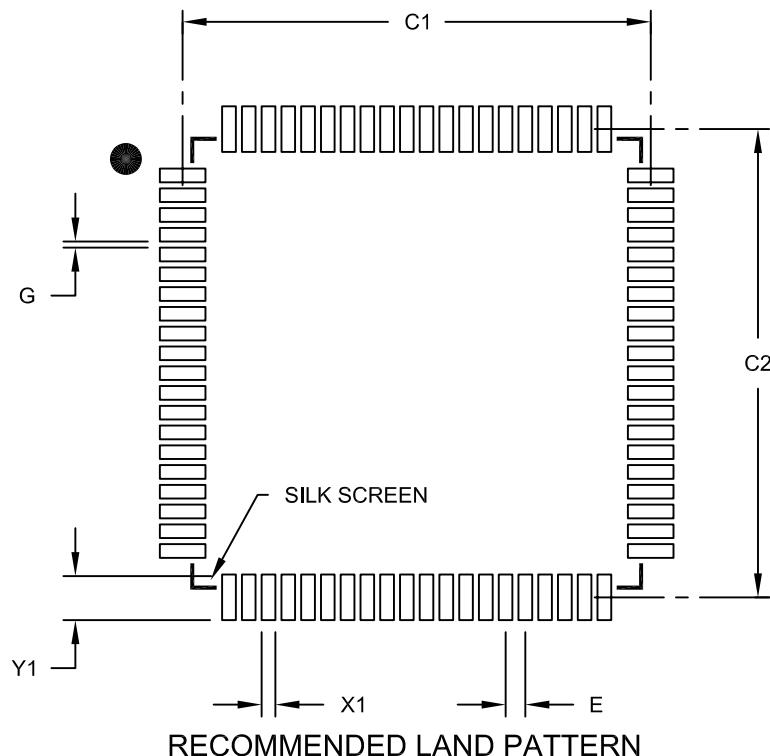
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-116B

Land Pattern (Footprint)

80-Lead Plastic Thin Quad Flatpack (PF) 14x14x1mm 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

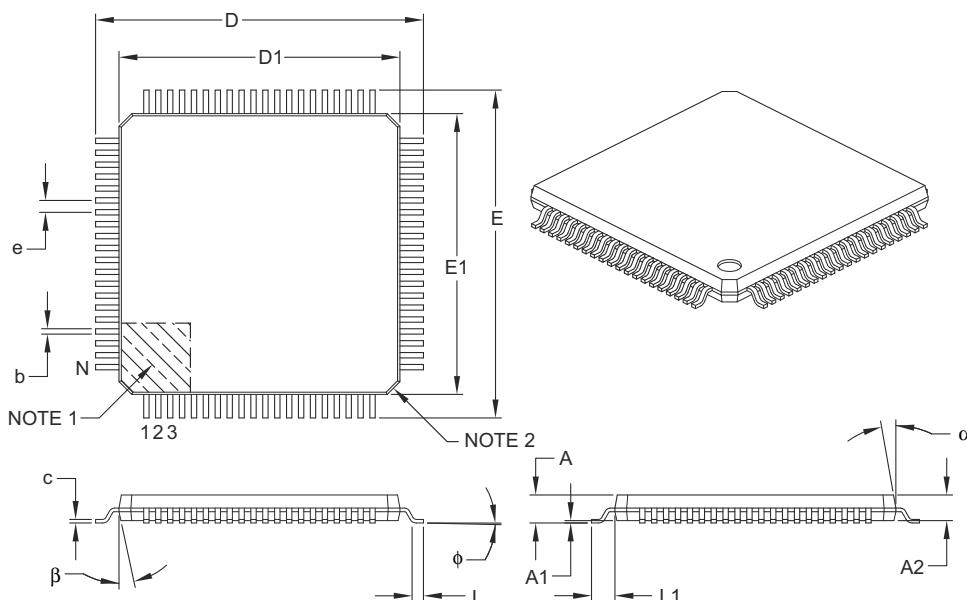
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2116C

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>



| Dimension Limits | | MILLIMETERS | | |
|--------------------------|----|-------------|------|------|
| | | 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 | 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 | 0.17 | 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.

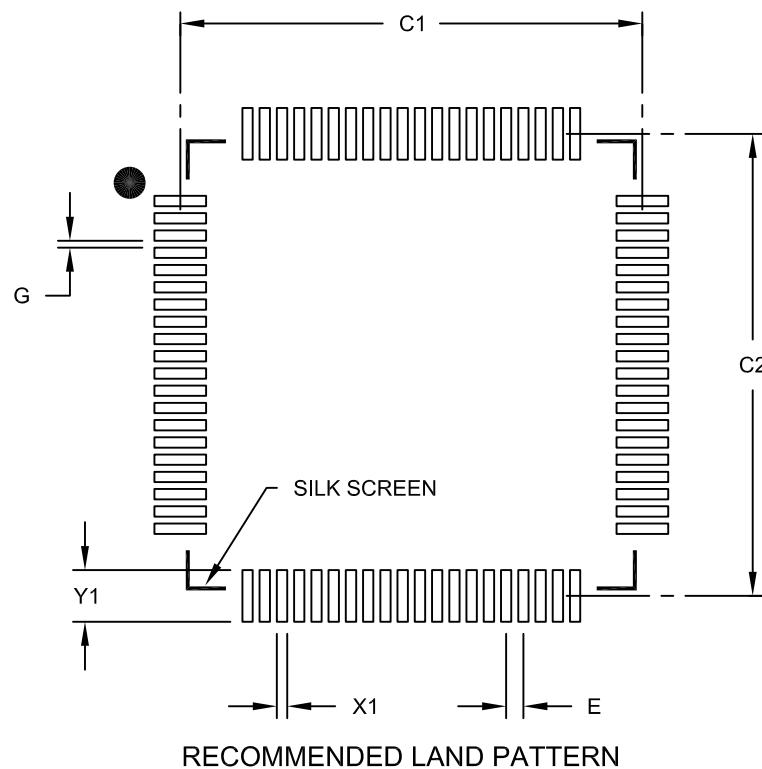
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

80-Lead Plastic Thin Quad Flatpack (PT) - 12x12x1mm 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 | | 0.50 | 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

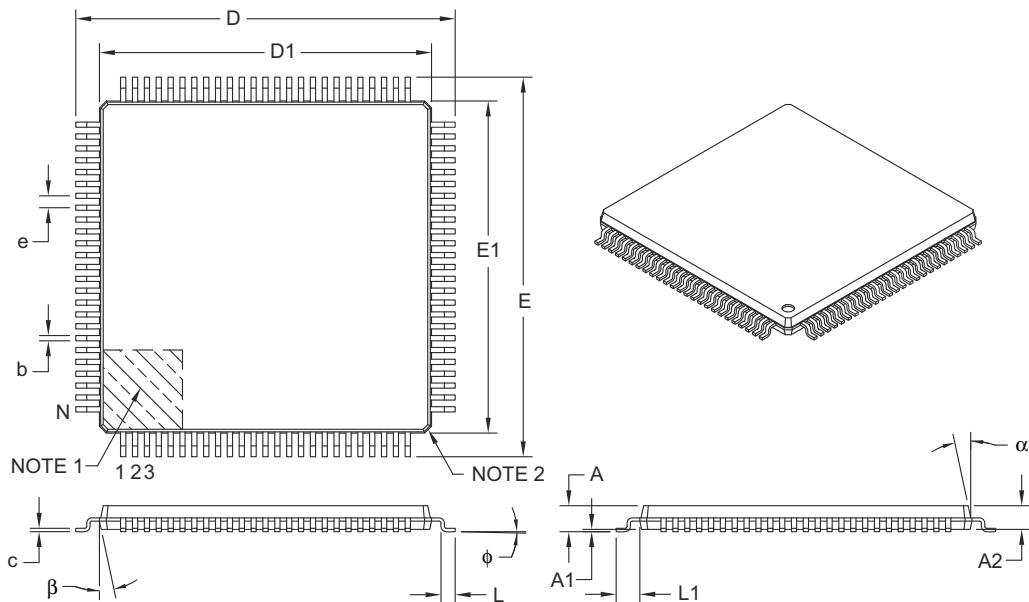
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2092B

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.

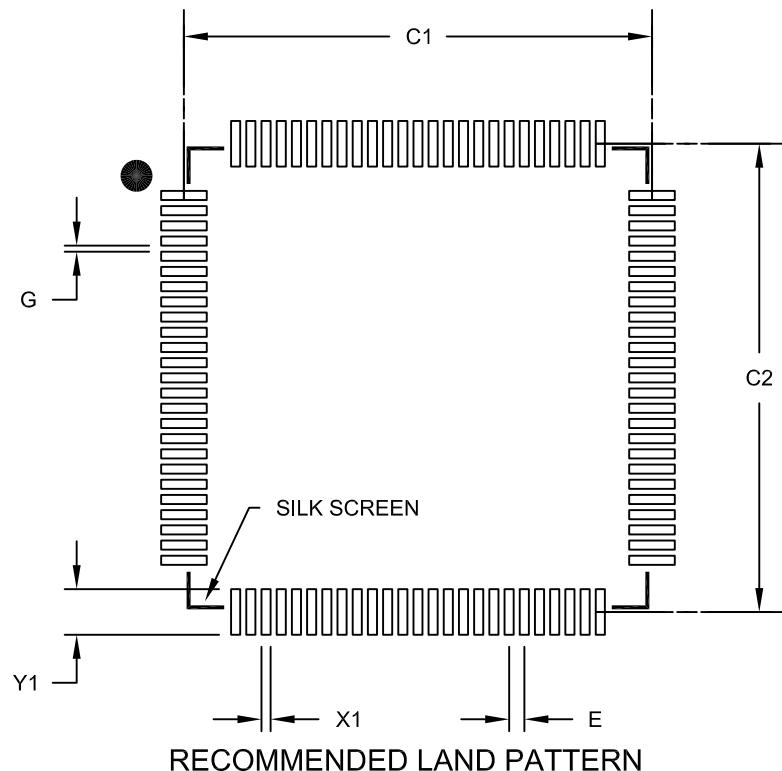
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-110B

Land Pattern (Footprint)

100-Lead Plastic Thin Quad Flatpack (PF) - 14x14x1 mm Body 2.00 mm 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 | | 0.50 | BSC |
| Contact Pad Spacing | C1 | | 15.40 | |
| Contact Pad Spacing | C2 | | 15.40 | |
| Contact Pad Width (X100) | X1 | | | 0.30 |
| Contact Pad Length (Y100) | Y1 | | | 1.50 |
| Distance Between Pads | G | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

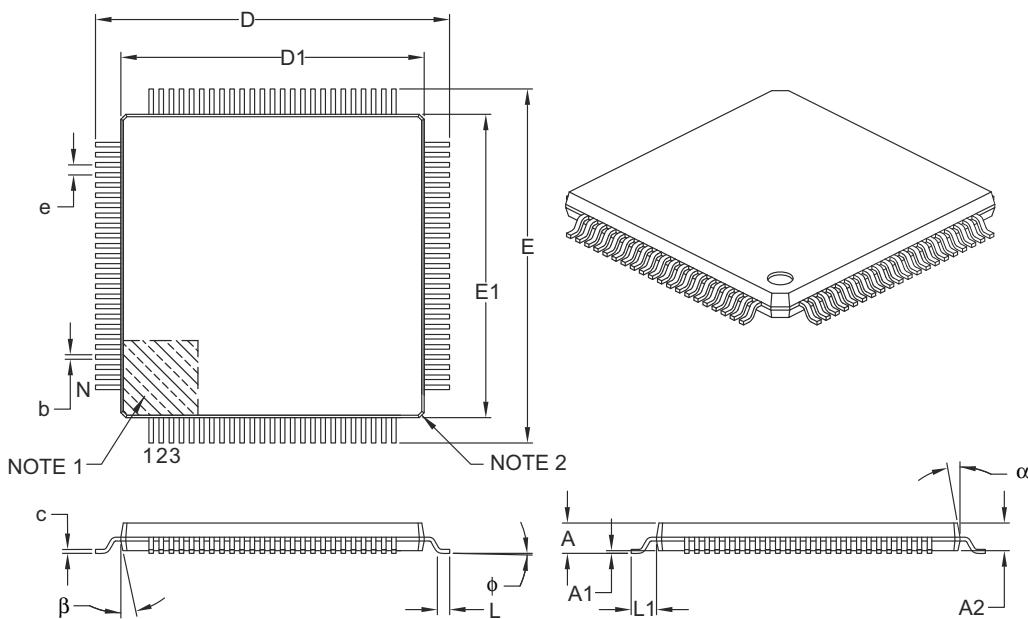
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2110B

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 | | 100 | | |
| Lead Pitch | | e 0.40 BSC | | |
| Overall Height | | A – | | |
| Molded Package Thickness | | A2 0.95 | | |
| Standoff | | A1 0.05 | | |
| Foot Length | | L 0.45 | | |
| Footprint | | L1 1.00 REF | | |
| Foot Angle | | phi 0° | | |
| 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 | | |
| Lead Width | | b 0.13 | | |
| Mold Draft Angle Top | | alpha 11° | | |
| Mold Draft Angle Bottom | | beta 11° | | |
| | | | | |
| | | | | |
| | | | | |

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.

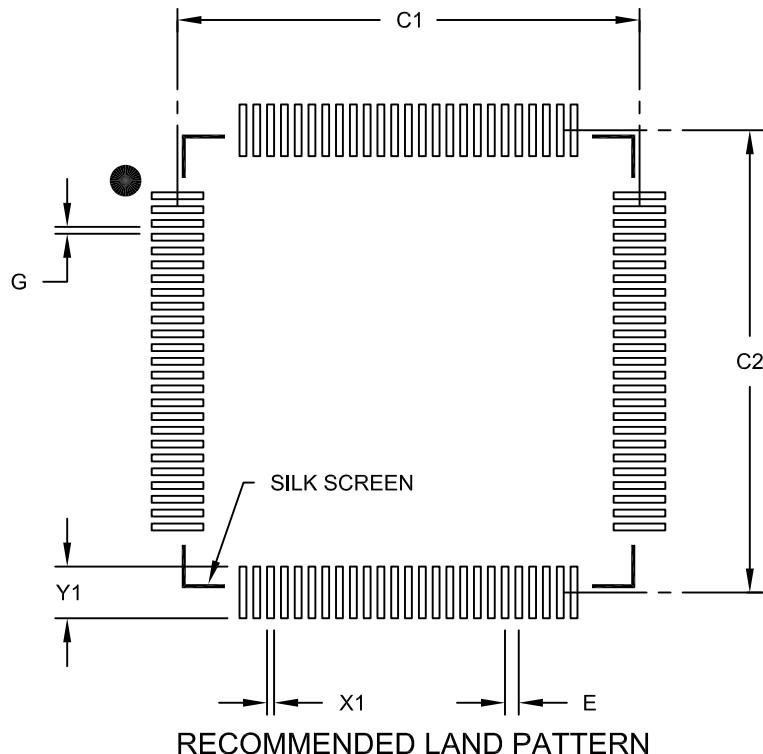
REF: Reference Dimension, usually without tolerance, for information purposes only.

Microchip Technology Drawing C04-100B

Land Pattern (Footprint)

100-Lead Plastic Thin Quad Flatpack (PT)-12x12x1mm 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 | 0.40 | BSC | | | | | |
| Contact Pad Spacing | C1 | | 13.40 | | | | | |
| Contact Pad Spacing | C2 | | 13.40 | | | | | |
| Contact Pad Width (X100) | X1 | | | 0.20 | | | | |
| Contact Pad Length (Y100) | Y1 | | | 1.50 | | | | |
| Distance Between Pads | G | 0.20 | | | | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

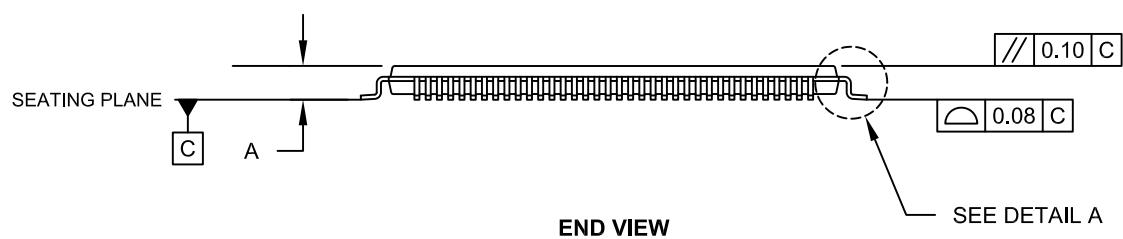
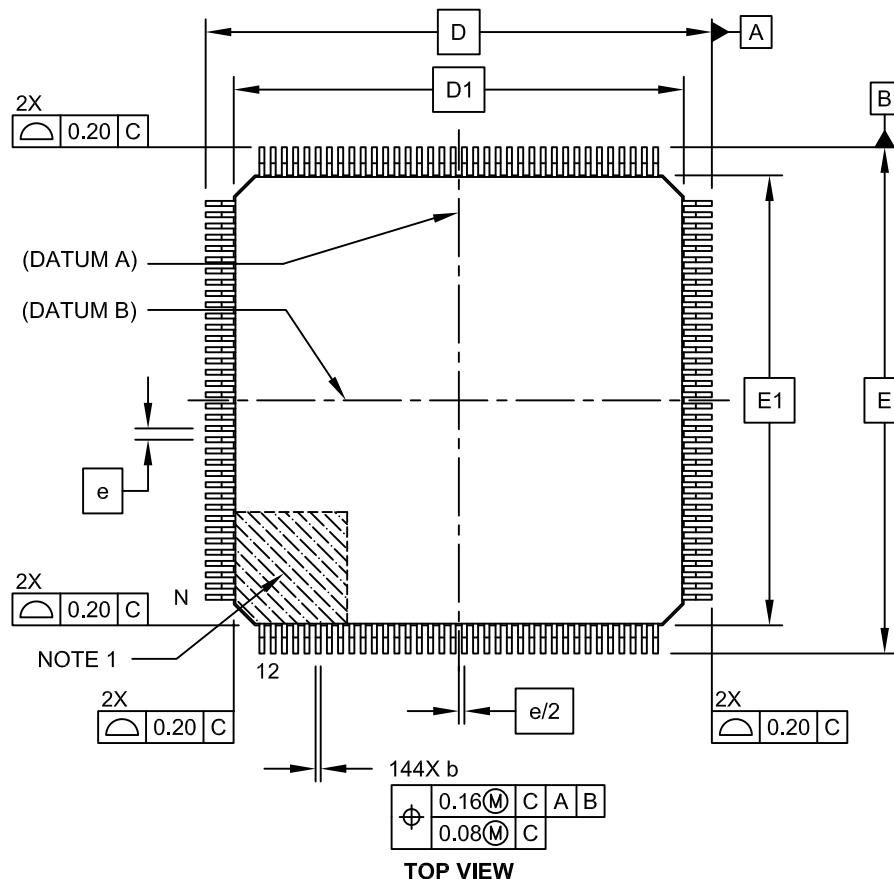
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-2100B

Packaging Diagrams and Parameters

144-Lead Plastic Thin Quad Flatpack (PH)-16x16x1mm Body, 2.00 mm Footprint [TQFP]

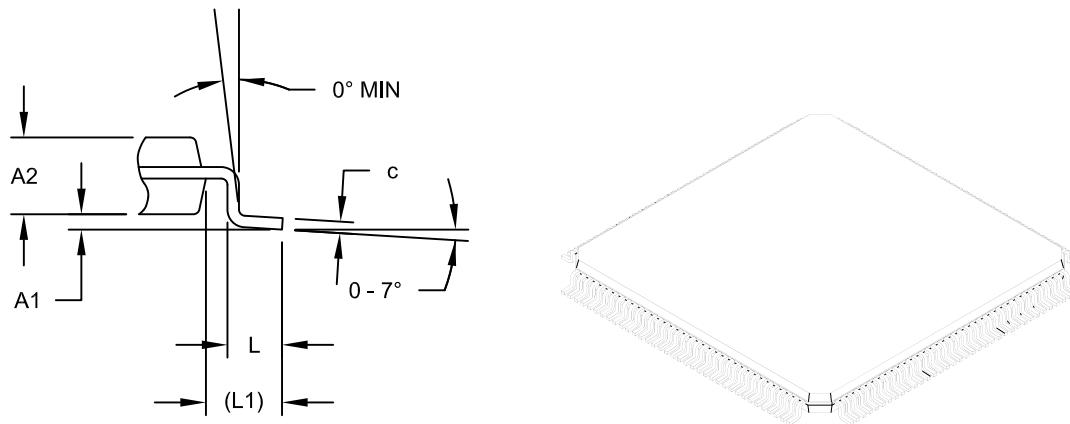
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

144-Lead Plastic Thin Quad Flatpack (PH)-16x16x1mm 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>



DETAIL A

| Units | | MILLIMETERS | | |
|-------------------------|--|-------------|-----|-----|
| Dimension Limits | | MIN | NOM | MAX |
| Number of Pins | | N | | |
| Lead Pitch | | e | | |
| Overall Height | | A | | |
| Molded PackageThickness | | A2 | | |
| Standoff | | A1 | | |
| Foot Length | | L | | |
| Footprint | | L1 | | |
| Overall Width | | D | | |
| Overall Length | | E | | |
| Molded Body Width | | D1 | | |
| Molded Body Length | | E1 | | |
| Lead Thickness | | c | | |
| Lead Width | | b | | |

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.

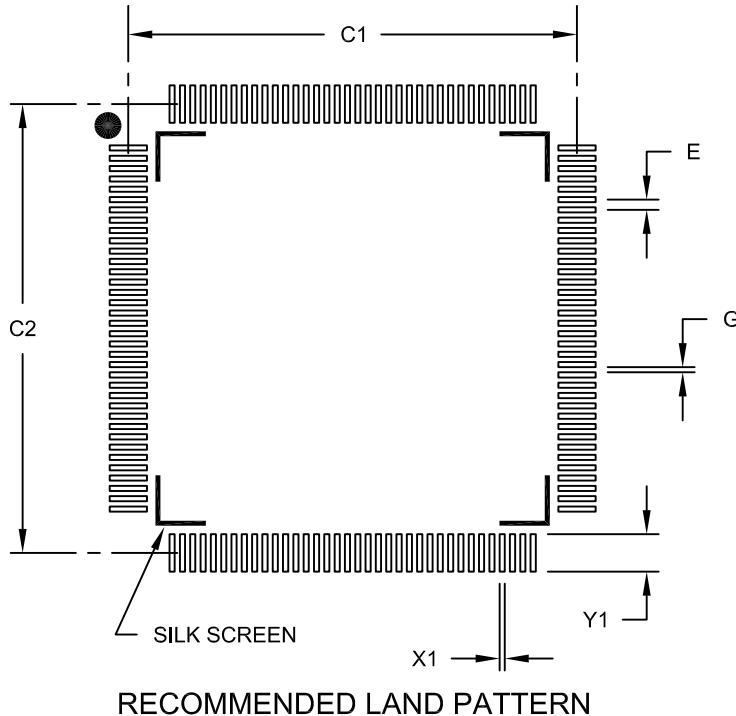
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Land Pattern (Footprint)

144-Lead Plastic Thin Quad Flat Pack (PH) - 16x16 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 | | | 0.40 | BSC | | |
| Contact Pad Spacing | C1 | | | 17.40 | | | |
| Contact Pad Spacing | C2 | | | 17.40 | | | |
| Contact Pad Width (X144) | X1 | | | | 0.20 | | |
| Contact Pad Length (X144) | Y1 | | | | | 1.45 | |
| 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. C04-2155B

Packaging Diagrams and Parameters

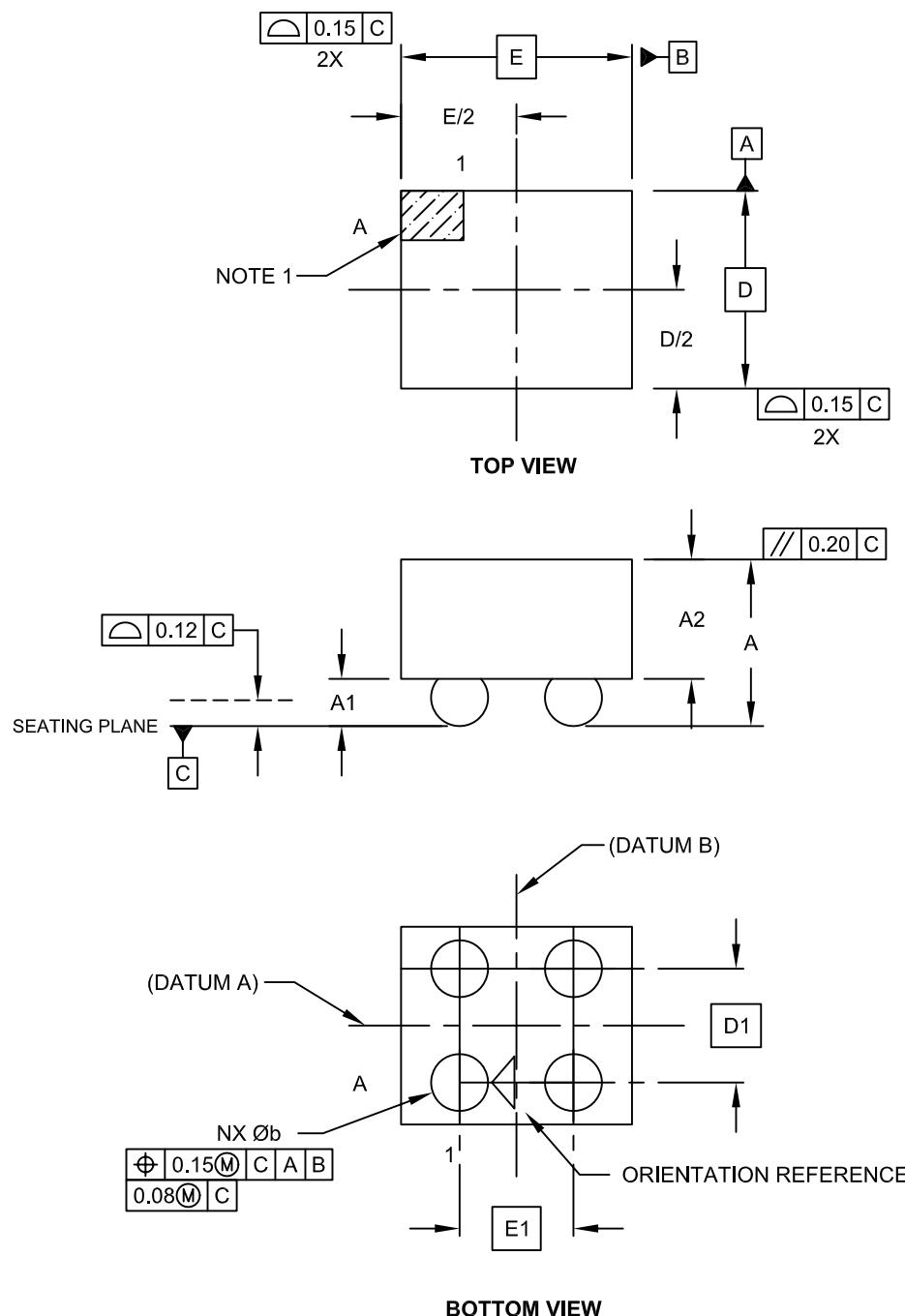
CSP Family

Chip Scale Packages

Packaging Diagrams and Parameters

4-Lead Chip Scale Package (CS) - [CSP]

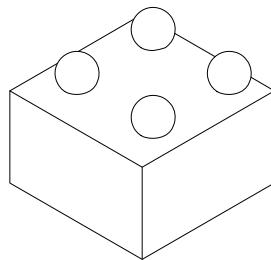
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

4-Lead Chip Scale Package (CS) - [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 | | | 4 | |
| Adjacent Column X-Pitch | E1 | | 0.400 | BSC | |
| Adjacent Row Y-Pitch | D1 | | 0.400 | BSC | |
| Overall Height | A | 0.47 | 0.51 | 0.55 | |
| Die Height | A2 | 0.33 | 0.35 | 0.37 | |
| Bump Height | A1 | 0.14 | 0.16 | 0.18 | |
| Overall Length | E | NOTE 4 | | | |
| Overall Width | D | NOTE 4 | | | |
| Ball Diameter | b | 0.18 | 0.200 | 0.22 | |

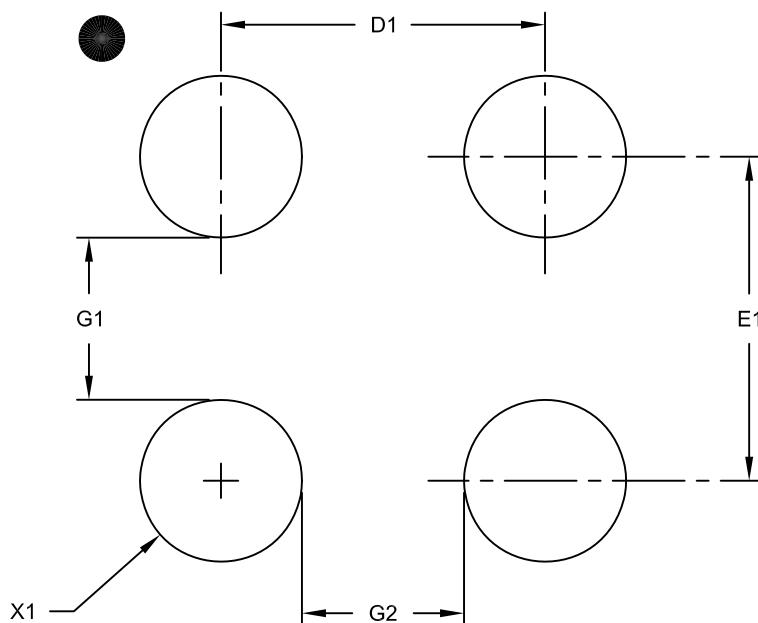
Notes:

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 contact our local Microchip representative for specific details.

Land Pattern (Footprint)

4-Lead Chip Scale Package (CS) - [CSP]

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 |
| Number of Contacts | N | | | | 4 | | |
| Contact Pad Spacing | E1 | | | | 0.40 | | |
| Contact Pad Spacing | D1 | | | | 0.40 | | |
| Contact Pad Diameter (X4) | X1 | | | | | 0.20 | |
| Distance Between Pads | G1 | 0.24 | | | | | |
| Distance Between Pads | G2 | 0.24 | | | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

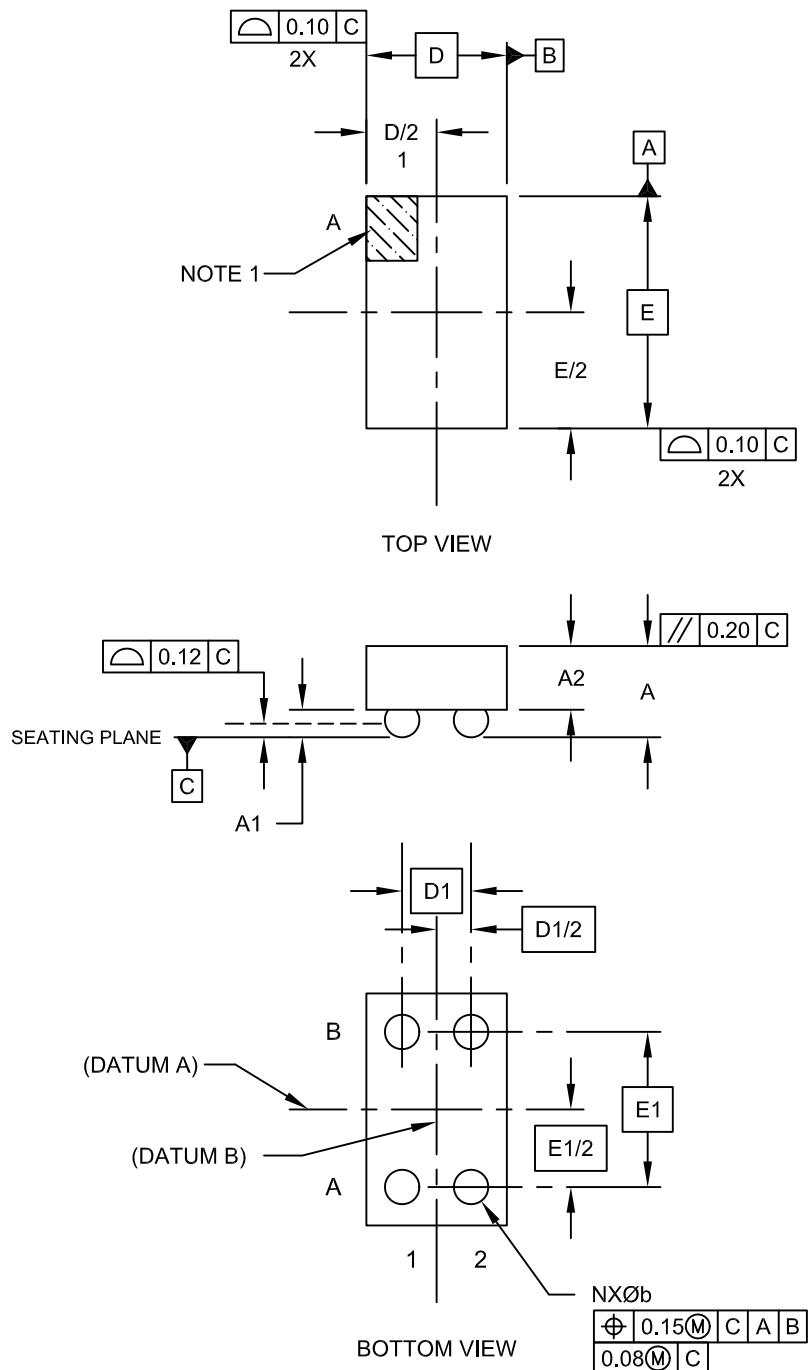
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-8005A

Packaging Diagrams and Parameters

4-Lead Chip Scale Package (CS) - [CSP]

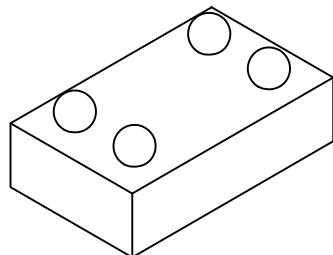
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

4-Lead Chip Scale Package (CS) - [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 | | 4 | |
| Adjacent Column X-Pitch | D1 | 0.400 BSC | | |
| Adjacent Row Y-Pitch | E1 | 0.900 BSC | | |
| Overall Height | A | 0.47 | 0.51 | 0.55 |
| Die Height | A2 | 0.33 | 0.35 | 0.37 |
| Bump Height | A1 | 0.14 | 0.16 | 0.18 |
| Overall Width | D | NOTE 4 | | |
| Overall Length | E | NOTE 4 | | |
| Ball Diameter | b | 0.18 | 0.20 | 0.22 |

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.

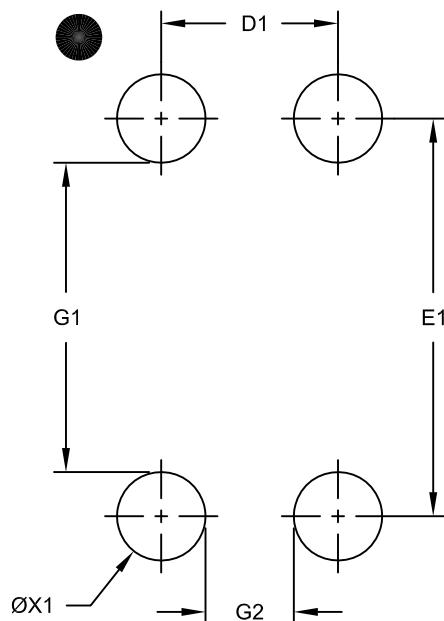
REF: Reference Dimension, usually without tolerance, for information purposes only.

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

Land Pattern (Footprint)

4-Lead Chip Scale Package (CS) - [CSP]

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 |
| Number of Contacts | N | | 4 | | |
| Contact Pad Spacing | D1 | | 0.40 | | |
| Contact Pad Spacing | E1 | | 0.90 | | |
| Contact Pad Diameter (X4) | ØX1 | | 0.20 | | |
| Distance Between Pads | G1 | | 0.70 | | |
| Distance Between Pads | G2 | | 0.20 | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

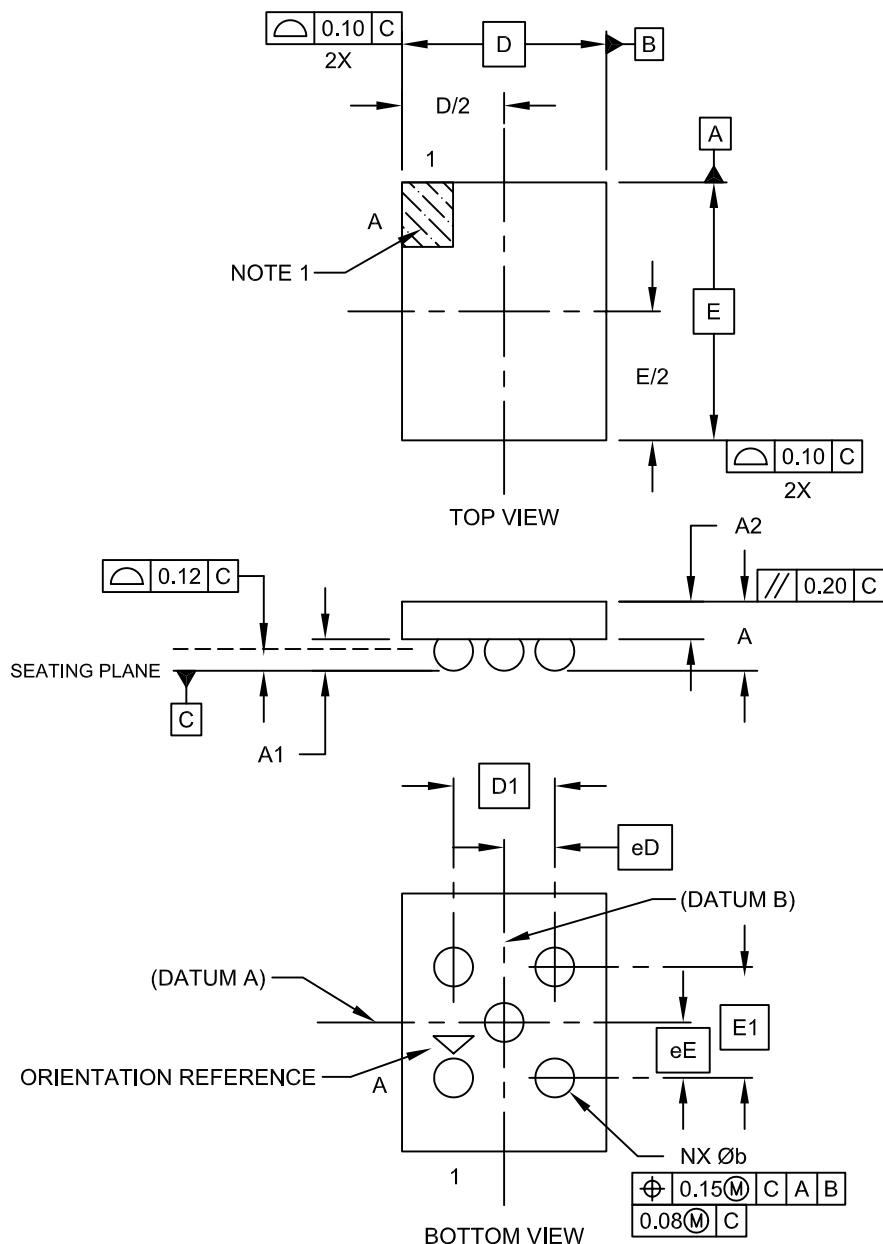
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-8008A

Packaging Diagrams and Parameters

5-Lead Chip Scale Package (CS) - [CSP]

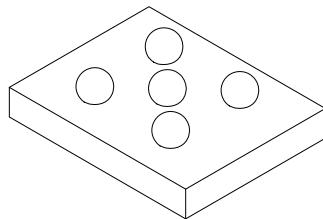
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

5-Lead Chip Scale Package (CS) - [CSP]

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 Contacts | N | | 5 | |
| Adjacent Column X-Pitch | E1 | 0.570 | BSC | |
| Adjacent Row Y-Pitch | D1 | 0.520 | BSC | |
| Adjacent Column X-Pitch | eE | 0.285 | BSC | |
| Adjacent Row Y-Pitch | eD | 0.260 | BSC | |
| Overall Height | A | 0.47 | 0.51 | 0.55 |
| Die Height | A2 | 0.33 | 0.35 | 0.37 |
| Bump Height | A1 | 0.14 | 0.16 | 0.18 |
| Overall Length | E | NOTE 4 | | |
| Overall Width | D | NOTE 4 | | |
| Ball Diameter | b | 0.18 | 0.20 | 0.22 |

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.

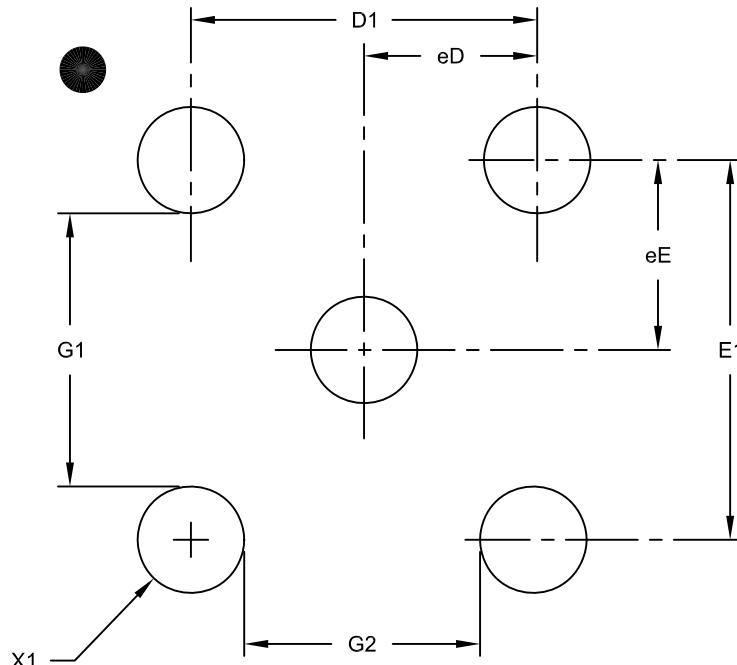
REF: Reference Dimension, usually without tolerance, for information purposes only.

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

Land Pattern (Footprint)

5-Lead Chip Scale Package (CS) - [CSP]

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 |
| Number of Contacts | N | | 5 | | |
| Contact Pitch Y | eE | | 0.285 | | |
| Contact Pitch X | eD | | 0.260 | | |
| Contact Pad Spacing | E1 | | 0.570 | | |
| Contact Pad Spacing | D1 | | 0.520 | | |
| Contact Pad Diameter (X5) | X1 | | | 0.20 | |
| Distance Between Pads | G1 | 0.41 | | | |
| Distance Between Pads | G2 | 0.36 | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

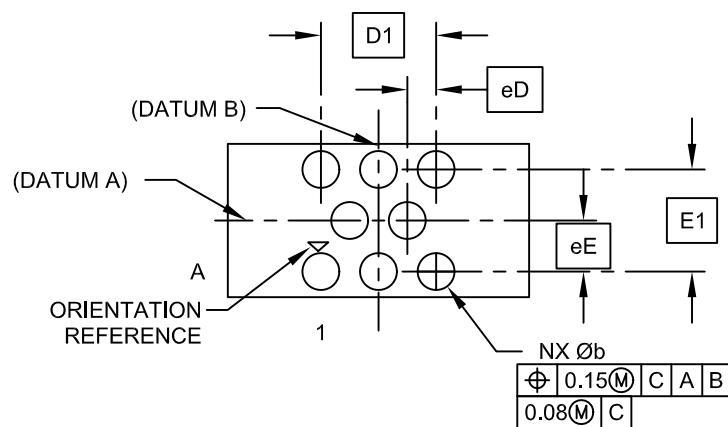
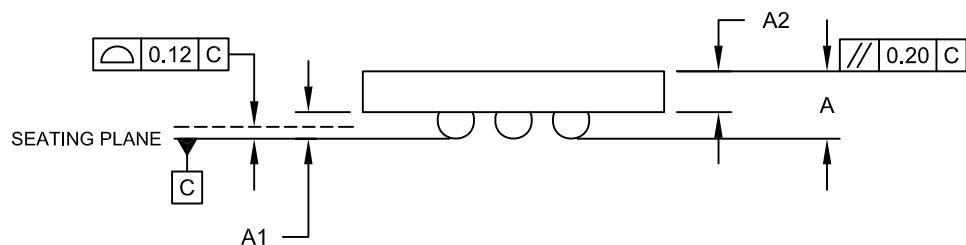
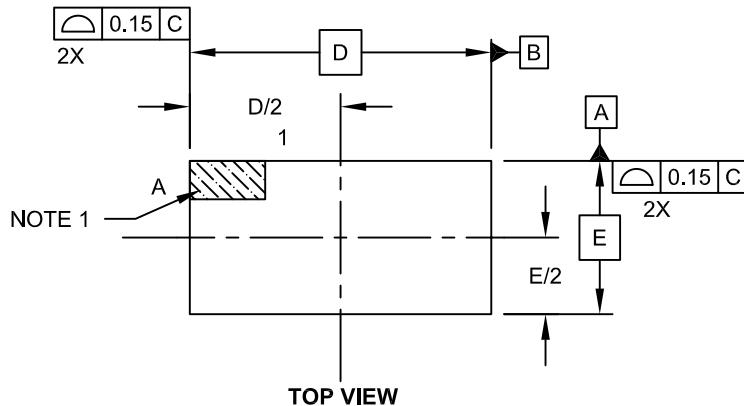
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

Microchip Technology Drawing No. C04-8004A

Packaging Diagrams and Parameters

8-Lead Chip Scale Package (CS) - [CSP]

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

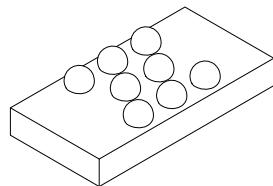


BOTTOM VIEW

Packaging Diagrams and Parameters

8-Lead Chip Scale Package (CS) - [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 | |
| Overall Grid X-Pitch | E1 | | 0.886 BSC | |
| Overall Grid Y-Pitch | D1 | | 1.00 BSC | |
| Adjacent Column X-Pitch | eE | | 0.443 BSC | |
| Adjacent Row Y-Pitch | eD | | 0.25 BSC | |
| Overall Height | A | 0.53 | 0.59 | 0.64 |
| Die Height | A2 | 0.33 | 0.36 | 0.38 |
| Bump Height | A1 | 0.20 | 0.23 | 0.26 |
| Overall Width | E | NOTE 4 | | |
| Overall Length | D | NOTE 4 | | |
| Ball Diameter | b | 0.30 | 0.32 | 0.34 |

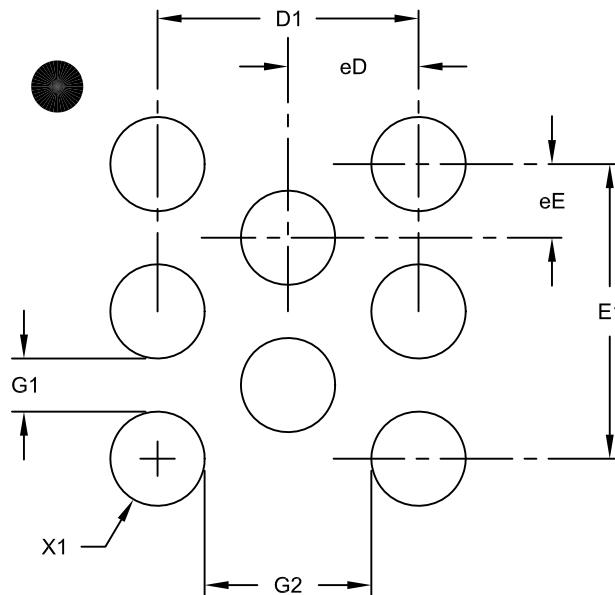
Notes:

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 contact your local Microchip representative for specific details

Land Pattern (Footprint)

8-Lead Chip Scale Package (CS) - [CSP]

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 |
| Number of Contacts | N | | 8 | | |
| Contact Pitch Y | eE | | | 0.25 | |
| Contact Pitch X | eD | | | 0.443 | |
| Contact Pad Spacing | E1 | | 1.00 | | |
| Contact Pad Spacing | D1 | | 0.886 | | |
| Contact Pad Diameter (X8) | X1 | | | 0.32 | |
| Distance Between Pads | G1 | 0.18 | | | |
| Distance Between Pads | G2 | 0.56 | | | |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-8001A



MICROCHIP

Packaging Diagrams and Parameters

NOTES:

Packaging Diagrams and Parameters

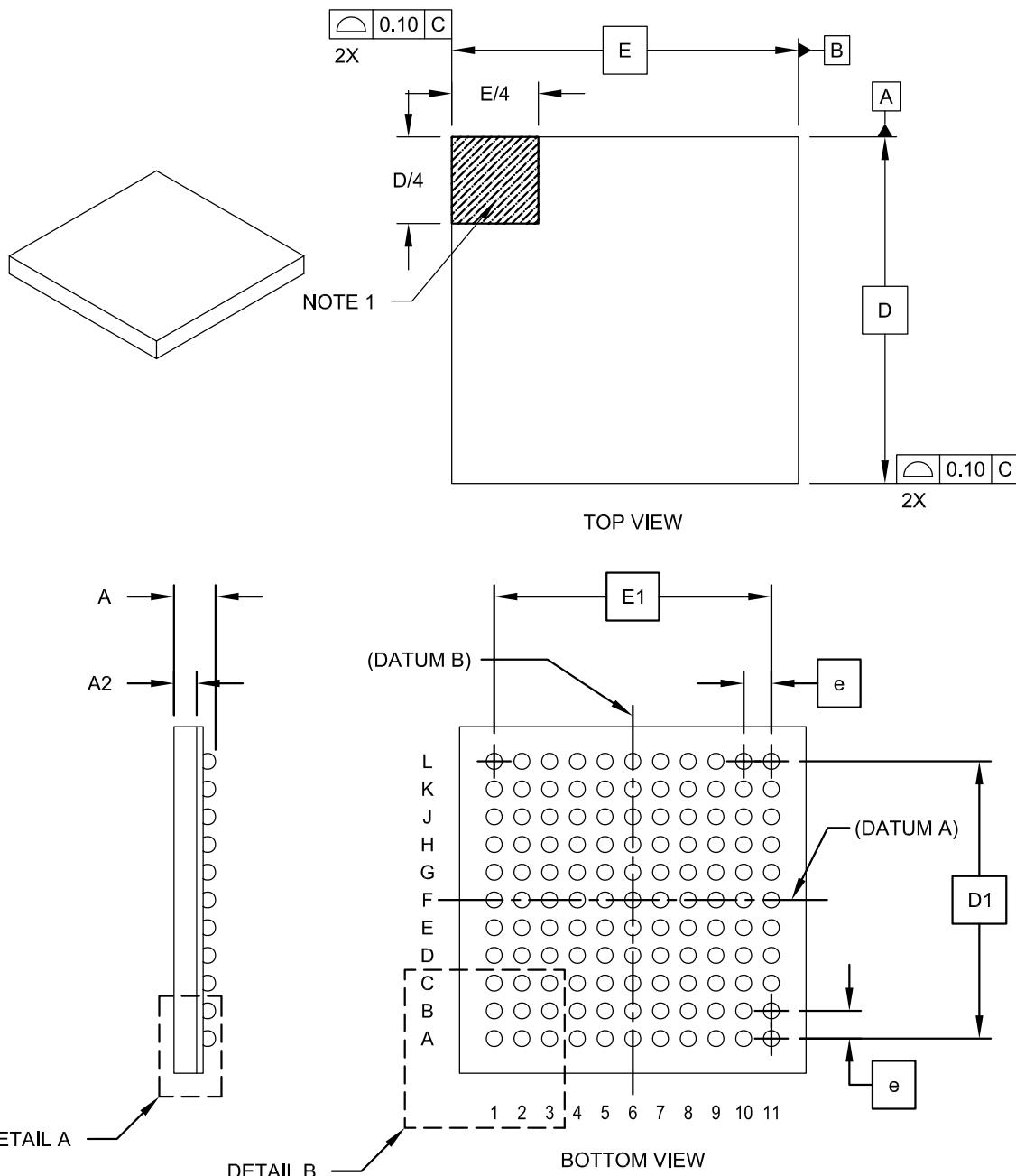
TFBGA Family
(Formerly XBGA Family)

Plastic Thin Profile Ball Grid Array Package

Packaging Diagrams and Parameters

121-Lead Plastic Thin Profile Ball Grid Array (BG) - 10x10x1.10 mm Body [TFBGA--Formerly XBGA]

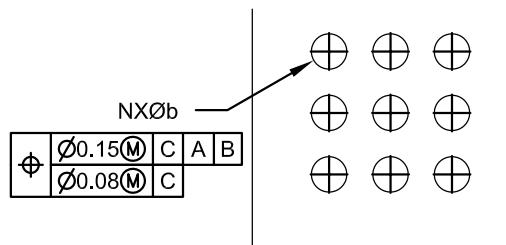
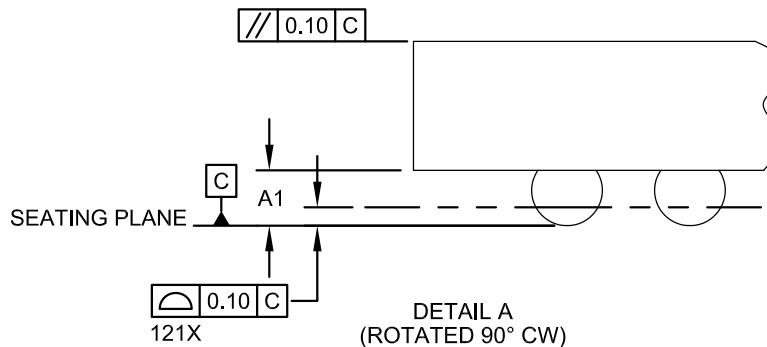
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

121-Lead Plastic Thin Profile Ball Grid Array (BG) - 10x10x1.10 mm Body [TFBGA—Formerly XBGA]

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



DETAIL B

| | | Units | MILLIMETERS | | |
|--------------------------|--|-------|-------------|------|------|
| Dimension Limits | | | MIN | NOM | MAX |
| Number of Contacts | | N | 121 | | |
| Contact Pitch | | e | 0.80 BSC | | |
| Overall Height | | A | 1.00 | 1.10 | 1.20 |
| Standoff | | A1 | 0.25 | 0.30 | 0.35 |
| Molded Package Thickness | | A2 | 0.55 | 0.60 | 0.65 |
| Overall Width | | E | 10.00 BSC | | |
| Array Width | | E1 | 8.00 BSC | | |
| Overall Length | | D | 10.00 BSC | | |
| Array Length | | D1 | 8.00 BSC | | |
| Contact Diameter | | b | 0.40 TYP | | |

Notes:

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

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

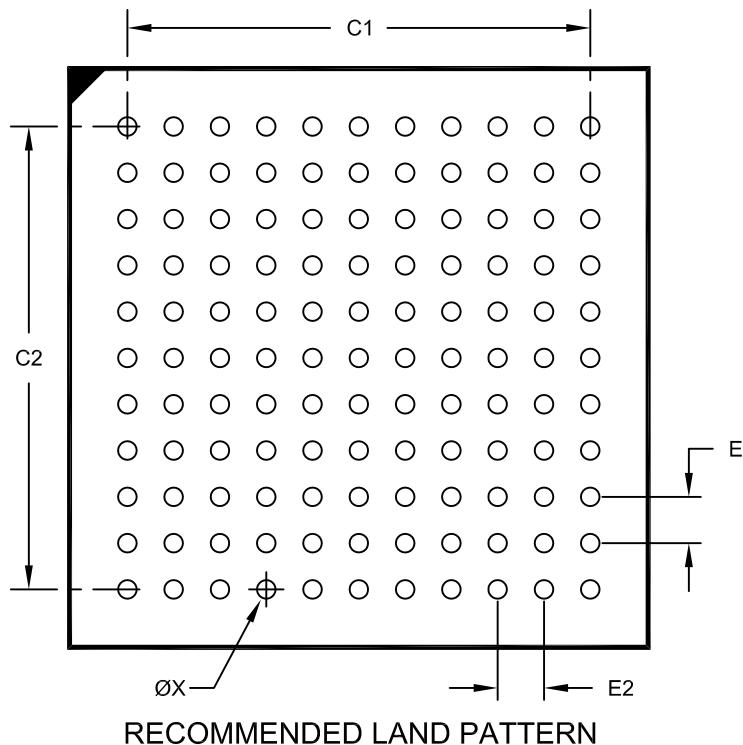
REF: Reference Dimension, usually without tolerance, for information purposes only.

3. The outer rows and columns of balls are located with respect to datums A and B.

Land Pattern (Footprint)

**121-Lead Plastic Thin Profile Ball Grid Array (BG) - 10x10x1.10 mm Body
[TFBGA--Formerly XBGA]**

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 | E1 | 0.80 | BSC | |
| Contact Pitch | E2 | 0.80 | BSC | |
| Contact Pad Spacing | C1 | | 8.00 | |
| Contact Pad Spacing | C2 | | 8.00 | |
| Contact Pad Diameter (X121) | X | | | 0.32 |

Notes:

1. Dimensioning and tolerancing per ASME Y14.5M

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

Microchip Technology Drawing No. C04-2148 Rev D

Packaging Diagrams and Parameters

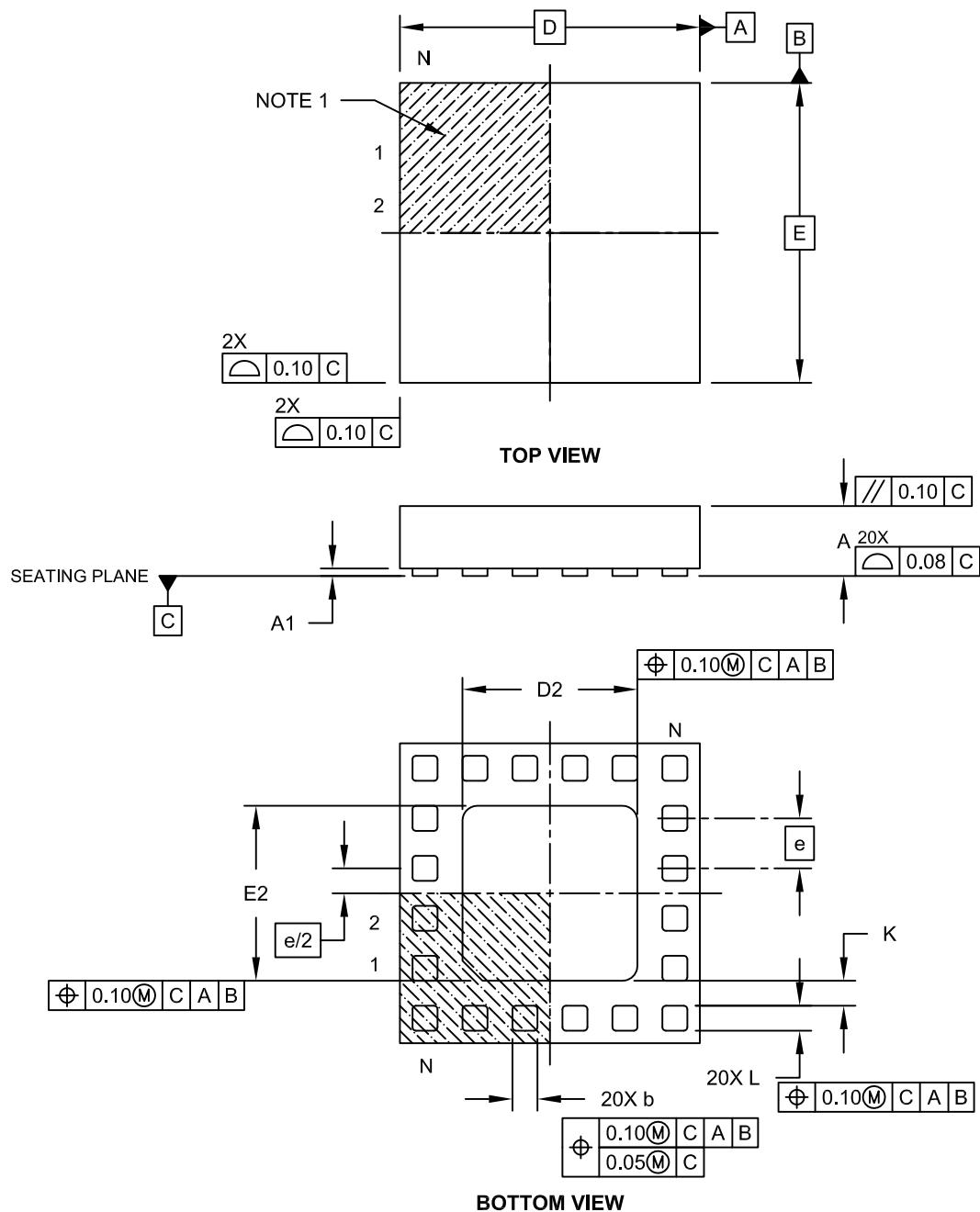
TLA Family

Thermal Leadless Array Packages

Packaging Diagrams and Parameters

20-Terminal Very, Very Thin Leadless Array Package (TW) – 3x3x0.7 mm Body With Exposed Pad [WTLA]

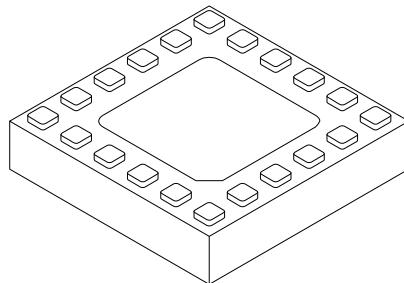
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

20-Terminal Very, Very Thin Leadless Array Package (TW) – 3x3x0.7 mm Body With Exposed Pad [WTLA]

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



| Dimension | Units | MILLIMETERS | | |
|------------------------|-------|-------------|------|-------|
| | | MIN | NOM | MAX |
| Number of Pins | N | 20 | | |
| Pitch | e | 0.50 | BSC | |
| Overall Height | A | 0.60 | - | 0.70 |
| Standoff | A1 | 0.025 | - | 0.075 |
| Overall Width | E | 3.00 | BSC | |
| Exposed Pad Width | E2 | 1.60 | 1.75 | 1.90 |
| Overall Length | D | 3.00 | BSC | |
| Exposed Pad Length | D2 | 1.60 | 1.75 | 1.90 |
| Contact Width | b | 0.20 | 0.25 | 0.30 |
| Contact Length | L | 0.20 | 0.25 | 0.30 |
| 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.

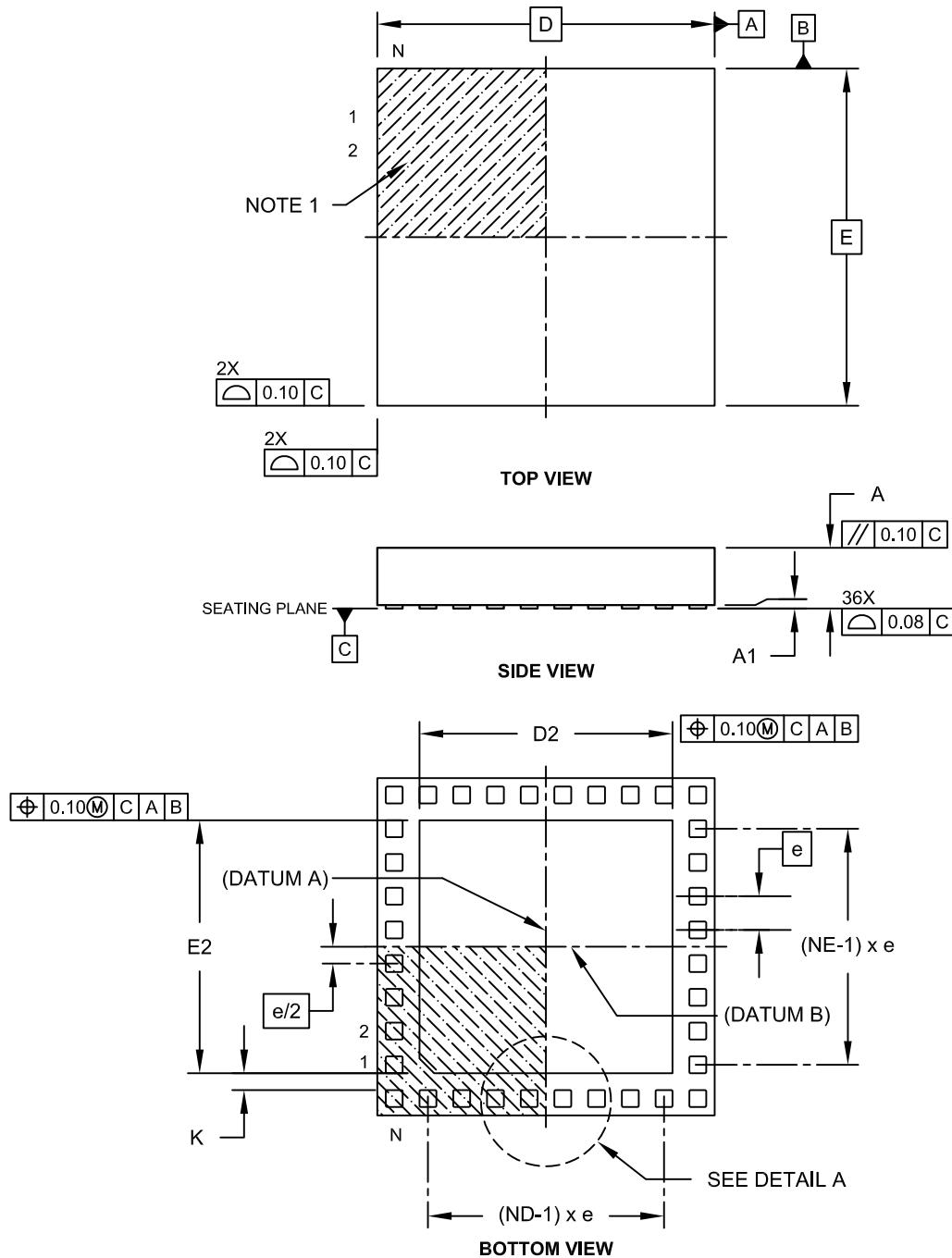
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

36-Terminal Very Thin Thermal Leadless Array Package (TL) – 5x5x0.9 mm Body with Exposed Pad [VTLA]

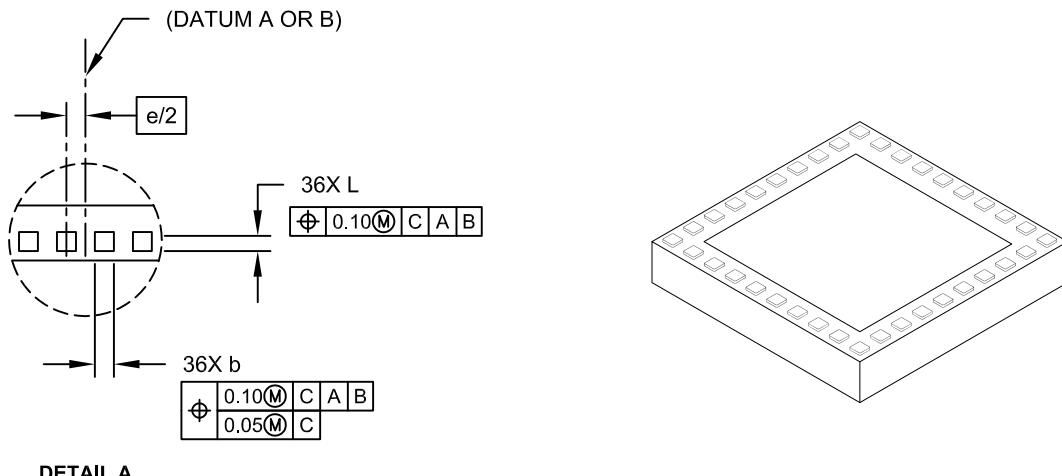
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

36-Terminal Very Thin Thermal Leadless Array Package (TL) – 5x5x0.9 mm Body with Exposed Pad [VTLA]

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



| Dimension | Units | MILLIMETERS | | |
|-------------------------|-------|-------------|----------|-------|
| | | MIN | NOM | MAX |
| Number of Pins | N | | 36 | |
| Number of Pins per Side | ND | | 10 | |
| Number of Pins per Side | NE | | 8 | |
| Pitch | e | | 0.50 BSC | |
| Overall Height | A | 0.80 | 0.90 | 1.00 |
| Standoff | A1 | 0.025 | - | 0.075 |
| Overall Width | E | | 5.00 BSC | |
| Exposed Pad Width | E2 | 3.60 | 3.75 | 3.90 |
| Overall Length | D | | 5.00 BSC | |
| Exposed Pad Length | D2 | 3.60 | 3.75 | 3.90 |
| Contact Width | b | 0.20 | 0.25 | 0.30 |
| Contact Length | L | 0.20 | 0.25 | 0.30 |
| 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.

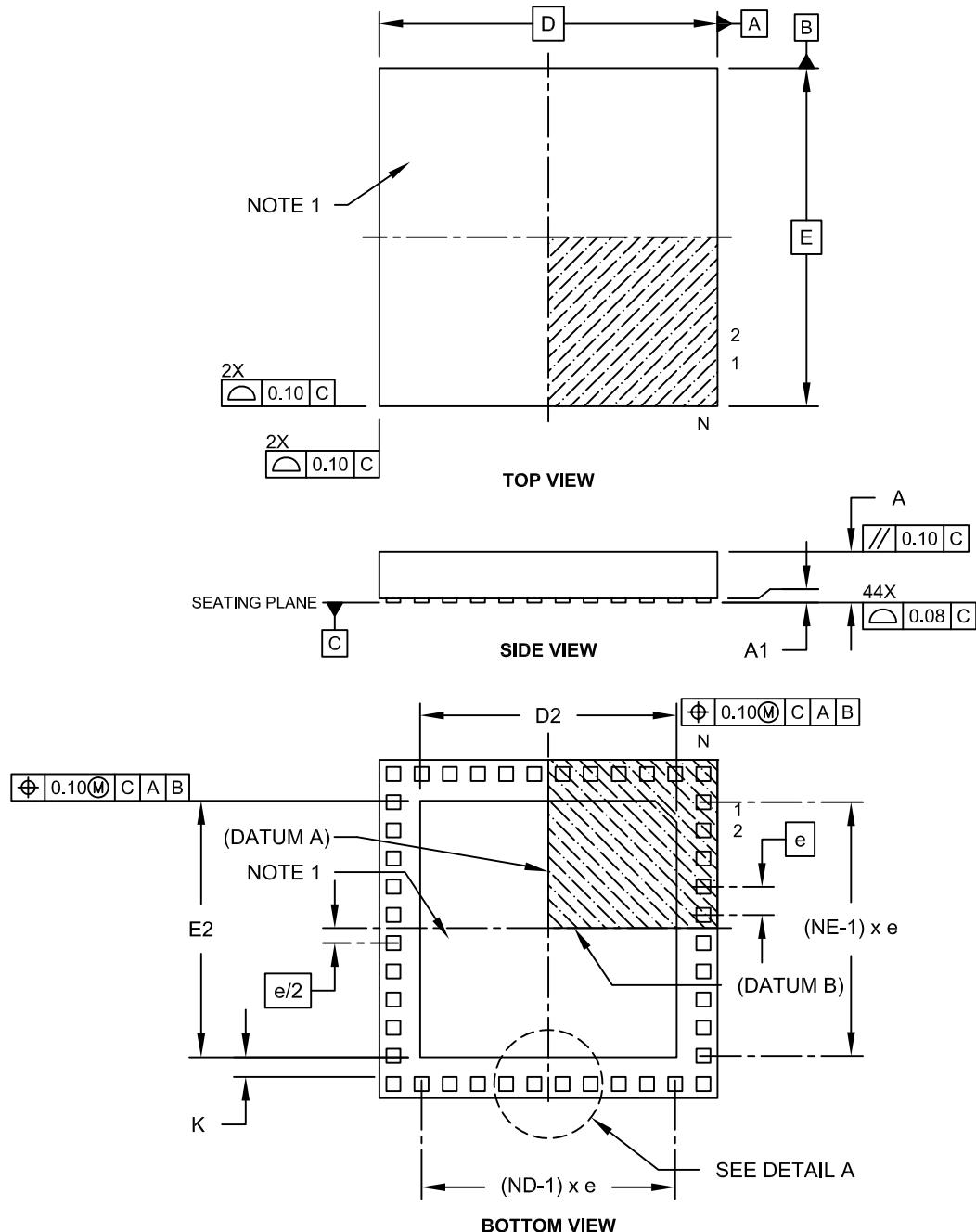
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

44-Terminal Very Thin Leadless Array Package (TL) – 6x6x0.9 mm Body With Exposed Pad [VTLA]

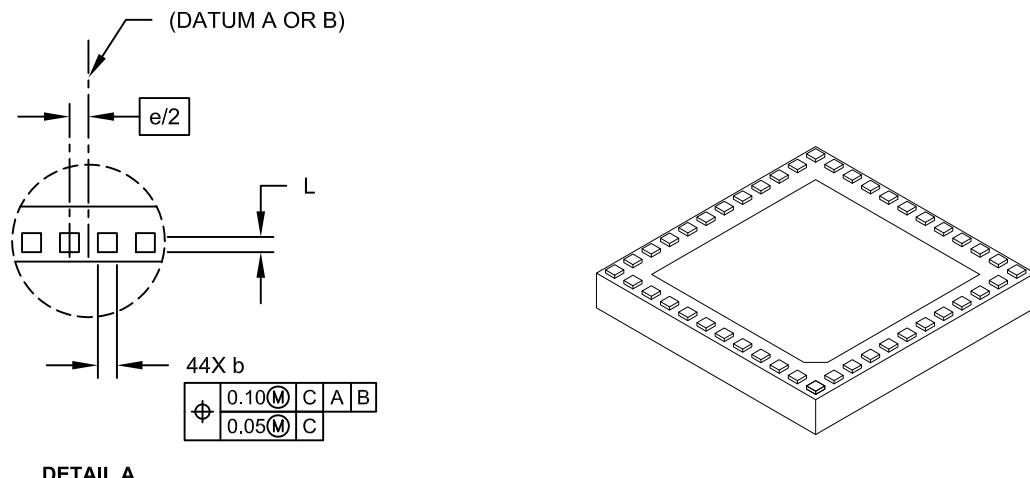
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

44-Terminal Very Thin Leadless Array Package (TL) – 6x6x0.9 mm Body With Exposed Pad [VTLA]

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



DETAIL A

| Dimension | Units | MILLIMETERS | | |
|-------------------------|-------|-------------|----------|-------|
| | | MIN | NOM | MAX |
| Number of Pins | N | | 44 | |
| Number of Pins per Side | ND | | 12 | |
| Number of Pins per Side | NE | | 10 | |
| Pitch | e | | 0.50 BSC | |
| Overall Height | A | 0.80 | 0.90 | 1.00 |
| Standoff | A1 | 0.025 | - | 0.075 |
| Overall Width | E | | 6.00 BSC | |
| Exposed Pad Width | E2 | 4.40 | 4.55 | 4.70 |
| Overall Length | D | | 6.00 BSC | |
| Exposed Pad Length | D2 | 4.40 | 4.55 | 4.70 |
| Contact Width | b | 0.20 | 0.25 | 0.30 |
| Contact Length | L | 0.20 | 0.25 | 0.30 |
| 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.

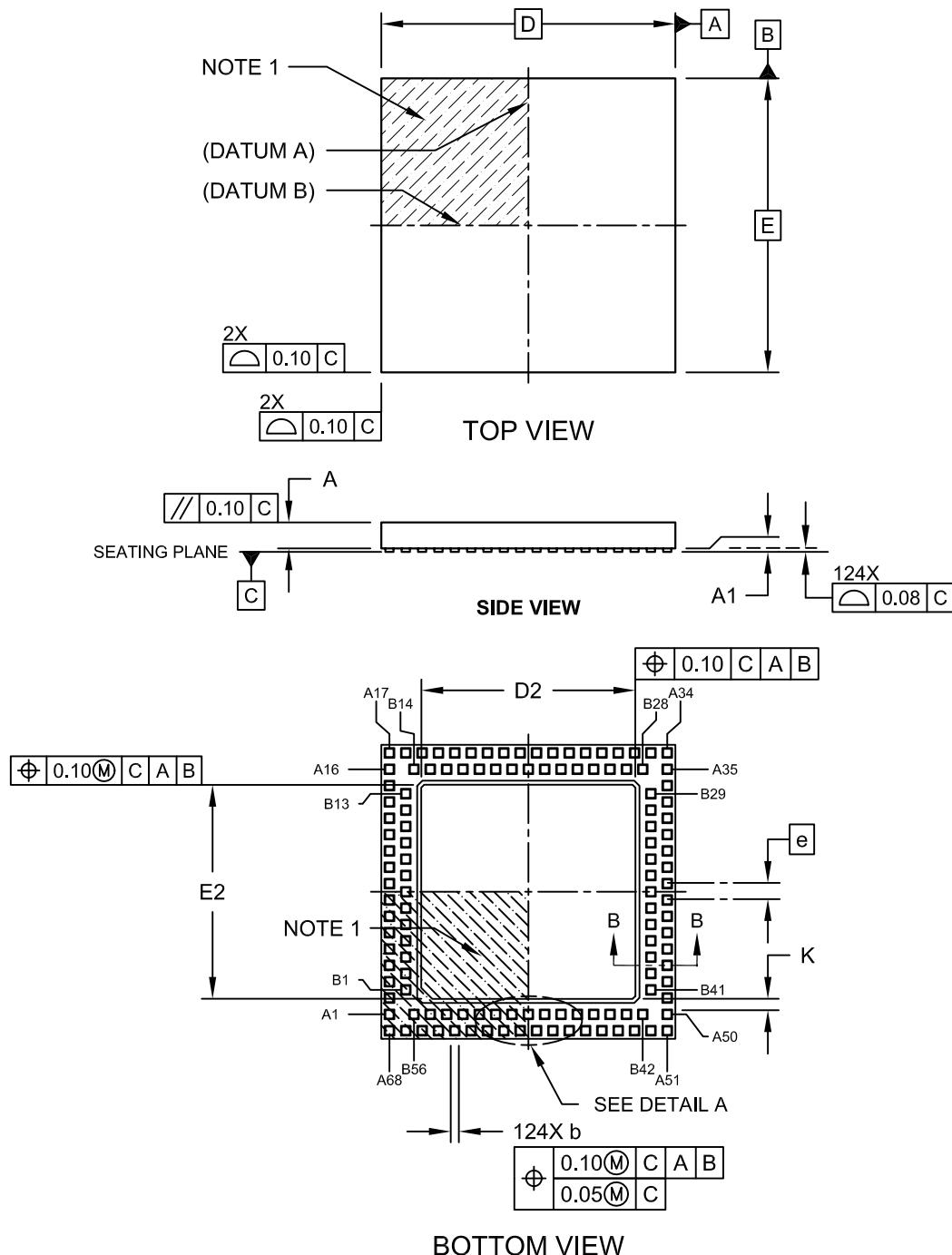
BSC: Basic Dimension. Theoretically exact value shown without tolerances.

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

Packaging Diagrams and Parameters

124-Terminal Very Thin Leadless Array Package (TL) – 9x9x0.9 mm Body [VTLA]

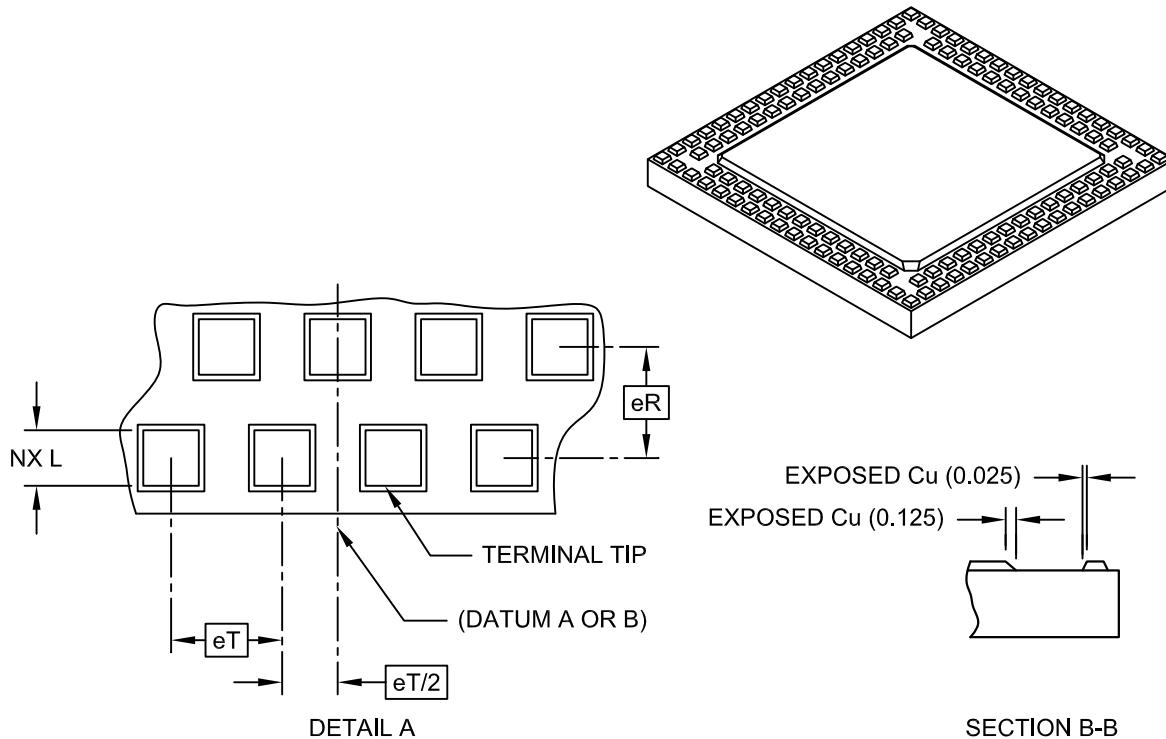
Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



Packaging Diagrams and Parameters

124-Terminal Very Thin Leadless Array Package (TL) – 9x9x0.9 mm Body [VTLA]

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 | | 124 | | |
| Pitch | eT | | 0.50 | BSC | |
| Pitch (Inner to outer terminal ring) | eR | | 0.50 | BSC | |
| Overall Height | A | 0.80 | 0.85 | 0.90 | |
| Standoff | A1 | 0.00 | - | 0.05 | |
| Overall Width | E | 9.00 BSC | | | |
| Exposed Pad Width | E2 | 6.40 | 6.55 | 6.70 | |
| Overall Length | D | 9.00 BSC | | | |
| Exposed Pad Length | D2 | 6.40 | 6.55 | 6.70 | |
| Contact Width | b | 0.20 | 0.25 | 0.30 | |
| Contact Length | L | 0.20 | 0.25 | 0.30 | |
| 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

Packaging Diagrams and Parameters

NOTES:

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).

Revision AX (January 2009)

Added Drawing 149A, 64-Lead Plastic Quad Flat, No Lead Package (ML) 6x6x0.9 mm Body [QFN] on page 140. This package is presented on 2 pages to facilitate a more explicit specification through the addition of geometric dimensioning and tolerancing (GD&T) information. GD&T symbols and rules are described and defined in the ASME Y14.5M-1994 standard (www.asme.org).

Revision AY (March 2009)

Revised Drawing 0131E, 8-Lead Plastic Dual Flat, No Lead Package (MD) 4x4x0.9 mm Body [DFN] to the new two-page format. It is shown on pages 115-116.

Also revised Drawing 149B, 64-Lead Plastic Quad Flat No Lead Package (MR) 9x9x0.9 mm Body [QFN] on pages 147-148. A corresponding land pattern (2149A), in the list below, was added.

The following packages are new:

- Drawing 151A, 6-Lead Plastic Small Outline Transistor (LT) [SC70] on pages 45-46.
- Drawing 2151A, 6-Lead Plastic Small Outline Transistor (LT) Footprint [SC70] on page 47.
- Drawing 2149A, 64-Lead Plastic Quad Flat, No Lead Package (MR) 9x9x0.9 mm Body Footprint [QFN] on page 149.
- Drawing 068A, 16-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body [TSSOP] on page 161-162.
- Drawing 2068A, 16-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 163.

- Drawing 6005A, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern [CSP] on pages 191-192.
- Drawing 8005A, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern Footprint [CSP] on page 193.
- Drawing 6004A, 5-Lead Chip Scale Package (CS) 2x1x2 Ball Pattern [CSP] on pages 195-196.
- Drawing 8004A, 5-Lead Chip Scale Package (CS) 2x1x2 Ball Pattern Footprint [CSP] on page 197.
- Drawing 6001A, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern [CSP] on pages 199-200. This package was designated Drawing 145A in the last version of the packaging specification (00049AX).
- Drawing 8001A, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern Footprint [CSP] on page 201.
- Drawing 6003A, 20-Lead Chip Scale Package (CS) 4x5 Special Array Pattern [CSP] on pages 203-204.
- Drawing 8003A, 20-Lead Chip Scale Package (CS) 4x5 Special Array Pattern Footprint [CSP] on page 205.
- Drawing 6002A, 28-Lead Chip Scale Package (CS) 7-6-7-6-7 [CSP] on pages 207-208.
- Drawing 8002A, 28-Lead Chip Scale Package (CS) 7-6-7-6-7 Footprint [CSP] on page 209.
- Appendix B: Control Dimensions (inspection information) on page 217.

Revision AZ (April 2009)

The following drawings were removed:

- Drawing 6003A, 20-Lead Chip Scale Package (CS) 4x5 Special Array Pattern [CSP] on pages 203-204.
- Drawing 8003A, 20-Lead Chip Scale Package (CS) 4x5 Special Array Pattern Footprint [CSP] on page 205.
- Drawing 6002A, 28-Lead Chip Scale Package (CS) 7-6-7-6-7 [CSP] on pages 207-208.
- Drawing 8002A, 28-Lead Chip Scale Package (CS) 7-6-7-6-7 Footprint [CSP] on page 209.

Appendix B: “Control Dimensions” was modified to include the item “Foot Angle” under **B.1 “On Surface Mount Devices (SMD)”** on page 391.

Revision BA (April 2009)

The following drawing is new:

- Drawing 142A, 16-Lead Plastic Quad Flat, No Lead Package (MG) 3x3x0.9 mm Body [QFN] on pages 126-127.

The following drawing was corrected:

- Drawing 2051A, 18-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 99. The second page of this drawing was incorrectly labeled as Drawing 2015A.

Note 4 on the following drawings has been modified to refer interested parties to a Microchip representative, instead of a data sheet, for details about the package:

- Drawing 6005A, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern [CSP] on page 194.
- Drawing 6004A, 5-Lead Chip Scale Package (CS) 2x1x2 Ball Pattern [CSP] on page 198.
- Drawing 6001A, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern [CSP] on page 202.

Revision BB (August 2009)

The following drawings are new:

- Drawing 0154A, 64-Lead Plastic Quad Flat, No Lead Package (MR) 9x9x0.9 mm Body with 5.40x5.40 Exposed Pad [QFN] on pages 152-153.
- Drawing 0152A, 28-Lead Plastic Ultra Thin Quad Flat, No Lead Package (MV) 4x4x0.5 mm Body [UQFN] on pages 154-155.
- Drawing 2111A, 8-Lead Plastic Micro Small Outline Package (MS) Footprint [MSOP] on page 157.
- Drawing 2021A, 10-Lead Plastic Micro Small Outline Package (MS) Footprint [MSOP] on page 161.
- Drawing 2086A, 8-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 169.
- Drawing 2087A, 14-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 171.
- Drawing 2088A, 20-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 177.
- Drawing 148A, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body [XBGA] on pages 216-217.

Revision BC (January 2010)

The following drawings are new or corrected:

- Drawing 2097A, 68-Lead Ceramic Leaded (CL) Chip Carrier w/Window Square Footprint [CER-QUAD] on page 31.
- Drawing 2112A, 84-Lead Ceramic Leaded (CL) Chip Carrier w/Window Square Footprint [CER-QUAD] on page 33.
- Drawing 2104A, 3-Lead Plastic Small Outline Transistor (NB) Footprint [SOT-23] on page 44.
- Drawing 2104A, 3-Lead Plastic Small Outline Transistor (TT) Footprint [SOT-23] on page 46.
- Drawing 2091A, 5-Lead Plastic Small Outline Transistor (CT) Footprint [SOT-23] on page 48.
- Drawing 2091A, 5-Lead Plastic Small Outline Transistor (OT) Footprint [SOT-23] on page 50.
- Drawing 2028A, 6-Lead Plastic Small Outline Transistor (CH) Footprint [SOT-23] on page 52.

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- Drawing 2028A, 6-Lead Plastic Small Outline Transistor (OT) Footprint [SOT-23] on page 54.
- Drawing 2130A, 3-Lead Plastic Small Outline Transistor (CB) Footprint [SOT-23A] on page 56.
- Drawing 2029A, 3-Lead Plastic Small Outline Transistor Header (MB) Footprint [SOT-89] on page 58.
- Drawing 2030A, 5-Lead Plastic Small Outline Transistor Header (MT) Footprint [SOT-89] on page 60.
- Drawing 2128A, 5-Lead Plastic Thin Small Outline Transistor (OS) Footprint [TSOT] on page 73.
- Drawing 2011A, 3-Lead Plastic (EB) Footprint [DDPAK] on page 77.
- Drawing 2012A, 5-Lead Plastic (ET) Footprint [DDPAK] on page 79.
- Drawing 2064A, 20-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 105.
- Drawing 2026A, 28-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 107.
- Drawing 2026A, 28-Lead Plastic Leaded Chip Carrier (LI) Square Footprint [PLCC] on page 109.
- Drawing 2023A, 32-Lead Plastic Leaded Chip Carrier (L) Rectangle Footprint [PLCC] on page 111.
- Drawing 2048A, 44-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 113.
- Drawing 2048A, 44-Lead Plastic Leaded Chip Carrier (LW) Square Footprint [PLCC] on page 115.
- Drawing 2049A, 68-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 117.
- Drawing 2049A, 68-Lead Plastic Leaded Chip Carrier (LS) Square Footprint [PLCC] on page 119.
- Drawing 2093A, 84-Lead Plastic Leaded Chip Carrier (L) Square Footprint [PLCC] on page 121.
- Drawing 056C, 8-Lead Plastic Small Outline (SM) Medium, 5.28 mm Body [SOIJ] on pages 134-135.
- Drawing 2094A, 20-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 144.
- Drawing 2025A, 24-Lead Plastic Small Outline (OG) Wide, 7.50 mm Body Footprint [SOIC] on page 146.
- Drawing 2025A, 24-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 148.
- Drawing 2052A, 28-Lead Plastic Small Outline (OI) Wide, 7.50 mm Body Footprint [SOIC] on page 150.
- Drawing 2052A, 28-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body Footprint [SOIC] on page 152.
- Drawing 062C, 8-Lead Plastic Dual Flat, No Lead Package (MF) 3x3x0.9 mm Body [DFN] on pages 159-160.
- Drawing 2131C, 8-Lead Plastic Dual Flat, No Lead Package (MD) 4x4x0.9 mm Body Footprint [DFN] on page 164.
- Drawing 0129C, 8-Lead Plastic Dual Flat, No Lead Package (MN) - 2x3x0.75 mm Body [TDFN] on pages 168-169.
- Drawing 2142A, 16-Lead Plastic Quad Flat, No Lead Package (MG) 3x3x0.9 mm Body Footprint [QFN] on page 177.
- Drawing 2139A, 20-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5x0.9 mm Body Footprint [QFN] on page 183.
- Drawing 118D, 40-Lead Plastic Quad Flat, No Lead Package (ML) 6x6x0.9 mm Body [QFN] on pages 194-195.
- Drawing 2118A, 40-Lead Plastic Quad Flat, No Lead Package (ML) 6x6x0.9 mm Body Footprint [QFN] on page 196.
- Drawing 2111A, 8-Lead Plastic Micro Small Outline Package (UA) Footprint [MSOP] on page 211.
- Drawing 2021A, 10-Lead Plastic Micro Small Outline Package (UN) Footprint [MSOP] on page 215.
- Drawing 2024A, 16-Lead Plastic Shrink Small Outline Narrow Body (QR) .150" Body Footprint [QSOP] on page 217.
- Drawing 2072A, 20-Lead Plastic Shrink Small Outline (SS) 5.30 mm Body Footprint [SSOP] on page 221.
- Drawing 2132A, 24-Lead Plastic Shrink Small Outline (SS) 5.30 mm Body Footprint [SSOP] on page 223.
- Drawing 2073A, 28-Lead Plastic Shrink Small Outline (SS) 5.30 mm Body Footprint [SSOP] on page 225.
- Drawing 2086A, 8-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body Footprint [TSSOP] on page 229.
- Drawing 044A, 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm [LQFP] on pages 243-244.
- Drawing 2044A, 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm Footprint [LQFP] on page 245.
- Drawing 2071A, 44-Lead Plastic Metric Quad Flatpack (KW) 10x10x2 mm Body, 3.20 mm Footprint [MQFP] on page 249.
- Drawing 2074A, 32-Lead Plastic Thin Quad Flatpack (PT) 7x7x1.0 mm Body, 2.00 mm Footprint [TQFP] on page 257.
- Drawing 155A, 144-Lead Plastic Thin Quad Flatpack (PH) 16x16x1 mm Body, 2.00 mm [TQFP] on pages 272-273.

- Drawing 2155A, 144-Lead Plastic Thin Quad Flatpack (PH) 16x16x1 mm Body, 2.00 mm Footprint [TQFP] on page 274.
- Drawing 6005D, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern [CSP] on pages 276-277.
- Drawing 8005A, 4-Lead Chip Scale Package (CS) 2x2 Ball Pattern Footprint [CSP] on page 276.
- Drawing 6004D, 5-Lead Chip Scale Package (CS) 2x1x2 Ball Pattern [CSP] on pages 279-280.
- Drawing 6001C, 8-Lead Chip Scale Package (CS) 3x2x3 Ball Pattern [CSP] on pages 282-283.
- Drawing 148A, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body [XBGA] on pages 286-287.
- Drawing 2148A, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body Footprint [XBGA] on page 288.

Revision BD (February 2010)

The following drawings are new:

Drawings 6008A (2) and 8008A, 4-Lead Chip Scale Package (CS) Package Code AL [CSP] on pages 279-282.

Revision BE (June 2010)

The following drawings are new:

- Drawing 162A, 8-Lead Thermally Enhanced Plastic Small Outline (SE) Narrow, 3.90 mm Body w/exposed heat slug [SOIC] on pages 130-131.
- Drawing 2162A, 8-Lead Thermally Enhanced Plastic Small Outline (SE) Narrow, 3.90 mm Body Footprint [SOIC] on page 132.
- Drawing 120B (Sheet 2), 6-Lead Plastic Dual Flat, No Lead Package (MA) 2x2x0.9 mm Body [DFN] on page 161.
- Drawing 2120A, 6-Lead Plastic Dual Flat, No Lead Package (MA) 2x2x0.9 mm Body Footprint [DFN] on page 162.
- Drawing 2143B, 24-Lead Plastic Quad Flat, No Lead Package (MJ) 4x4 mm Body Footprint [QFN] on page 193.
- Drawing 156A, 40-Lead Plastic Ultra Thin Quad Flat No Lead Package (MV) 5x5 mm Body [UQFN] on pages 214-215.
- Drawing 2156A, 40-Lead Plastic Ultra Thin Quad Flat No Lead Package (MV) 5x5 mm Body Footprint [UQFN] on page 216.
- Drawing 087C (Sheet 2), 14-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body [TSSOP] on page 241.
- Drawing 2044A, 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm Footprint [LQFP] on page 257.

The following drawings have been revised:

- Drawing 2030C 5-Lead Plastic Small Outline Transistor Header (MT) Footprint [SOT-89] on page 60.
- Drawing 057C 8-Lead Plastic Small Outline (SN) Narrow, 3.90 mm Body [SOIC] on pages 124-125.
- Drawing 057C 8-Lead Plastic Small Outline (OA) Narrow, 3.90 mm Body [SOIC] on pages 124-125.
- Drawing 120B 6-Lead Plastic Dual Flat, No Lead Package (MA) 2x2x0.9 mm Body [DFN] on page 160.
- Drawing 0129C 8-Lead Plastic Dual Flat, No Lead Package (MN) - 2x3x0.75 mm Body [TDFN] on page 176-177.
- Drawing 087C 14-Lead Plastic Thin Shrink Small Outline (ST) 4.4 mm Body [TSSOP] on page 240.
- Drawing 044B 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm [LQFP] on page 255-256.
- Drawing 008A 4-Lead Chip Scale (CS) [CSP] on page 291.
- Drawing 6008A 4-Lead Chip Scale Package PkgCode_AL (continued) (CS) 2x2 Ball Pattern [CSP] on page 292.
- Drawing 148B 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body [XBGA] on pages 302-303.
- Drawing 2148B 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body Footprint [XBGA] on page 304.

Revision BF (July 2010)

Drawings C04-028A and C04-2028A with CHY package designators have been added for the 6-Lead Plastic Small Outline Transistor (CHY) [SOT-23] package and associated land pattern. The drawings appear on pages 53 and 54.

Revision BG (March 2011)

The following drawings are new:

- Drawing 065C, 14-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body [SOIC] on page 136.
- Drawing 065C, 14-Lead Plastic Small Outline (sheet 2) (OD) Narrow, 3.90 mm Body [SOIC] on page 139.
- Drawing 108C, 16-Lead Plastic Small Outline (sheet 2) (SL) Narrow, 3.90 mm Body [SOIC] on page 142.
- Drawing 102C, 16-Lead Plastic Small Outline (sheet 2) (SO) Wide, 7.50 mm Body [SOIC] on page 148.

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- Drawing 102C, 16-Lead Plastic Small Outline (sheet 2) (OE) Wide, 7.50 mm Body [SOIC] on page 151.
 - Drawing 051C, 18-Lead Plastic Small Outline (sheet 2) (SO) Wide, 7.50 mm Body [SOIC] on page 154.
 - Drawing 094C, 20-Lead Plastic Small Outline (sheet 2) (SO) Wide, 7.50 mm Body [SOIC] on page 157.
 - Drawing 025C, 24-Lead Plastic Small Outline (sheet 2) (SO) Wide, 7.50 mm Body [SOIC] on page 160.
 - Drawing 025C, 24-Lead Plastic Small Outline (sheet 2) (OG) Wide, 7.50 mm Body [SOIC] on page 163.
 - Drawing 052C, 28-Lead Plastic Small Outline (sheet 2) (SO) Wide, 7.50 mm Body [SOIC] on page 166.
 - Drawing 052C, 28-Lead Plastic Small Outline (sheet 2) (OI) Wide, 7.50 mm Body [SOIC] on page 169.
 - Drawing 078A, 6-Lead Plastic Dual Flat, No Lead Package (MY) 2x2x0.8 mm Body [TDFN] on pages 188-189.
 - Drawing 185A, 10-Lead Plastic Dual Flat, No Lead Package (MN) 3x3x0.8 mm Body [TDFN] on pages 193-194.
 - Drawing 063C, 10-Lead Plastic Dual Flat, No Lead Package (sheet 2) (MF) 3x3x0.9 mm Body [DFN] on page 198.
 - Drawing 2063B, 10-Lead Plastic Dual Flat, No Lead Package (MF) 3x3x0.9 mm Body Footprint [DFN] on page 199.
 - Drawing 140B, 28-Lead Plastic Quad Flat, No Lead Package (sheet 2) (MQ) 5x5x0.9 mm Body [QFN] on page 214.
 - Drawing 153A, 48-Lead Plastic Ultra Thin Quad Flat No Lead Package (MV) 6x6x0.5 mm Body [UQFN] on pages 235-236.
 - Drawing 184A, 20-Lead Thermal Leadless Array Package (TL) 3x3x0.7 Exposed Pad [UQFN] on pages 326-327.
 - Drawing 187B, 36-Lead Thermal Leadless Array Package (TL) 5x5x0.9 Exposed Pad [TLA] on pages 328-329.
 - Drawing 157B, 44-Lead Thermal Leadless Array Package (TL) 6x6x0.9 Exposed Pad [TLA] on pages 330-331.
- Drawing 099C, 14-Lead Ceramic Dual In-Line w/Window (JW) .300" Body [CERDIP] on page 19.
 - Drawing 003C, 16-Lead Ceramic Dual In-Line w/Window (JE) .300" Body [CERDIP] on page 20.
 - Drawing 010C, 18-Lead Ceramic Dual In-Line (JW) .300" Body [CERDIP] on page 21.
 - Drawing 115C, 20-Lead Ceramic Dual In-Line w/Window (JW) .300" Body [CERDIP] on page 22.
 - Drawing 004C, 24-Lead Ceramic Dual In-Line (JG) .600" Body [CERDIP] on page 23.
 - Drawing 006C, 28-Lead Ceramic Dual In-Line (JN) .600" Body [CERDIP] on page 24.
 - Drawing 080C, 28-Lead Ceramic Dual In-Line w/Window (JW) .300" Body [CERDIP] on page 25.
 - Drawing 013C, 28-Lead Ceramic Dual In-Line w/Window (JW) .600" Body [CERDIP] on page 26.
 - Drawing 008C, 40-Lead Ceramic Dual In-Line (JK) .600" Body [CERDIP] on page 27.
 - Drawing 014C, 40-Lead Ceramic Dual In-Line w/Window (JW) .600" Body [CERDIP] on page 28.
 - Drawing 162B, 8-Lead Thermally Enhanced Plastic Small Outline (SE) Narrow, 3.90 mm Body [SOIC] on page 132.
 - Drawing 162B, 8-Lead Thermally Enhanced Plastic Small Outline w/exposed heat slug (sheet 2) (SE) Narrow, 3.90 mm Body [SOIC] on page 133.
 - Drawing 065C, 14-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body [SOIC] on page 135.
 - Drawing 065C, 14-Lead Plastic Small Outline (OD) Narrow, 3.90 mm Body [SOIC] on page 138.
 - Drawing 108C, 16-Lead Plastic Small Outline (SL) Narrow, 3.90 mm Body [SOIC] on page 141.
 - Drawing 102C, 16-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC] on page 147.
 - Drawing 102C, 16-Lead Plastic Small Outline (OE) Wide, 7.50 mm Body [SOIC] on page 150.
 - Drawing 051C, 18-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC] on page 153.
 - Drawing 094C, 20-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC] on page 156.
 - Drawing 025C, 24-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC] on page 159.
 - Drawing 025C, 24-Lead Plastic Small Outline (OG) Wide, 7.50 mm Body [SOIC] on page 162.
 - Drawing 052C, 28-Lead Plastic Small Outline (SO) Wide, 7.50 mm Body [SOIC] on page 165.
 - Drawing 052C, 28-Lead Plastic Small Outline (OI) Wide, 7.50 mm Body [SOIC] on page 168.

The following drawings have been revised:

- Drawing 001C, 8-Lead Ceramic Dual In-Line w/Window (JA) .300" Body [CERDIP] on page 16.
- Drawing 027C, 8-Lead Ceramic Dual In-Line (JW) .300" Body [CERDIP] on page 17.
- Drawing 002C, 14-Lead Ceramic Dual In-Line (JD) .300" Body [CERDIP] on page 18.

- Drawing 2123B, 8-Lead Plastic Dual Flat, No Lead Package (MC) 2x3x0.9 mm Body Footprint [DFN] on page 178.
- Drawing 2062B, 8-Lead Plastic Dual Flat, No Lead Package (MF) 3x3x0.9 mm Body Footprint [DFN] on page 181.
- Drawing 063C, 10-Lead Plastic Dual Flat, No Lead Package (MF) 3x3x0.9 mm Body [DFN] on page 197.
- Drawing 140B, 28-Lead Plastic Quad Flat, No Lead Package (MQ) 5x5x0.9 mm Body [QFN] on page 213.
- Drawing 149C, 64-Lead Plastic Quad Flat No Lead Package (MR) 9x9x0.9 mm Body w/7.15x7.15 exposed pad [QFN] on page 225-226.
- Drawing 2156B, 40-Lead Plastic Ultra Thin Quad Flat No Lead Package (MV) 5x5 mm Body Footprint [UQFN] on page 234.
- Drawing 2044B, 144-Lead Plastic Low Profile Quad Flatpack (PL) 20x20x1.40 mm Body, 2.0 mm Footprint [LQFP] on page 277.
- Drawing 2071B, 44-Lead Plastic Metric Quad Flatpack (KW) 10x10x2 mm Body, 3.20 mm Footprint [MQFP] on page 281.
- Drawing 2071B, 44-Lead Plastic Metric Quad Flatpack (PQ) 10x10x2 mm Body, 3.20 mm Footprint [MQFP] on page 283.
- Drawing 2022B, 64-Lead Plastic Metric Quad Flatpack (BU) 14x14x2.7 mm Body, 3.20 mm Footprint [MQFP] on page 285.
- Drawing 2074B, 32-Lead Plastic Thin Quad Flatpack (PT) 7x7x1.0 mm Body, 2.00 mm Footprint [TQFP] on page 289.
- Drawing 2076B, 44-Lead Plastic Thin Quad Flatpack (PT) 10x10x1 mm Body, 2.00 mm Footprint [TQFP] on page 291.
- Drawing 2085B, 64-Lead Plastic Thin Quad Flatpack (PT) 10x10x1 mm Body, 2.00 mm Footprint [TQFP] on page 293.
- Drawing 2116C, 80-Lead Plastic Thin Quad Flatpack (PF) 14x14x1 mm Body, 2.00 mm Footprint [TQFP] on page 297.
- Drawing 2092B, 80-Lead Plastic Thin Quad Flatpack (PT) 12x12x1 mm Body, 2.00 mm Footprint [TQFP] on page 299.
- Drawing 2110B, 100-Lead Plastic Thin Quad Flatpack (PF) 14x14x1 mm Body, 2.00 mm Footprint [TQFP] on page 301.
- Drawing 2100B, 100-Lead Plastic Thin Quad Flatpack (PT) 12x12x1 mm Body, 2.00 mm Footprint [TQFP] on page 303.
- Drawing 155B, 144-Lead Plastic Thin Quad Flatpack (PH) 16x16x1 mm Body, 2.00 mm [TQFP] on page 304.

- Drawing 155B, 144-Lead Plastic Thin Quad Flatpack (sheet 2) (PH) 16x16x1 mm Body, 2.00 mm [TQFP] on page 305.
- Drawing 2155B, 144-Lead Plastic Thin Quad Flatpack (PH) 16x16x1 mm Body, 2.00 mm Footprint [TQFP] on page 306.

Revision BH (November 2011)

The following drawings are new:

- Drawing 121A, 8-Lead Thermally Enhanced Plastic Outline Body (SE) Narrow 3.90 Body on pages 130-131.
- Drawing 2121A, 8-Lead Thermally Enhanced Plastic Outline Body (SE) Narrow 3.90 Body Footprint on page 132.
- Drawing 194A, 10-Lead Plastic Ultra Thin Dual Flat No Lead (NA[Y]) 3x3x05 mm Body [UDFN] on pages 342-343.
- Drawing 2148D, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body Footprint [TFBGA] on page 344.

The following drawings have been revised:

- Drawing 111C, 8-Lead Plastic Micro Small Outline Package (MS) [MSOP] on pages 254-255.
- Drawing 111C, 8-Lead Plastic Micro Small Outline Package (UA) [MSOP] on pages 257-258.
- Drawing 021C, 10-Lead Plastic Micro Small Outline Package (MS) [MSOP] on pages 260-261.
- Drawing 021C, 10-Lead Plastic Micro Small Outline Package (UN) [MSOP] on pages 263-264.
- Drawing 148D, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body [TFBGA] on pages 342-343.
- Drawing 2148D, 121-Lead Plastic Thin Profile Ball Grid Array (BG) 10x10x1.10 mm Body Footprint [TFBGA] on page 344.

Revision BJ (December 2011)

The following drawings are new:

- Drawing 188A, 8-Lead High Power Dual Flat, No Lead Package (MF) 5x6x1.0 mm Body [PDFN] on pages 200-201.
- Drawing 197A, 16-Lead Plastic Quad Flat, No Lead Package (NG) 3x3x0.9 mm Body [QFN] on pages 216-217.
- Drawing 2197A, 16-Lead Plastic Quad Flat, No Lead Package (NG) 3x3x0.9 mm Body Footprint [QFN] on page 220.

The following drawing has been revised:

- Drawing 120C, 6-Lead Plastic Dual Flat, No Lead Package (MA[Y]) 2x2x0.9 mm Body [DFN] on pages 180-181.

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Revision BK (June 2012)

The following drawings are new:

- Drawing 141A, 6-Lead Plastic Thin Small Outline Transistor (OS) [TSOT] on pages 78-79.
- Drawing 2188B, 8-Lead Plastic Dual Flat No Lead Package (MF) 5x6x1.0 mm Body Footprint [PDFN] on page 204
- Drawing 195A, 8-Lead Plastic Dual Flat No Lead Package (LC) 3.3x3.3x1.0 mm Body [PDFN] on pages 205-206.
- Drawing 2195A, 8-Lead Plastic Dual Flat No Lead Package (LC) 3.3x3.3x1.0 mm Body Footprint [PDFN] on page 207.
- Drawing 078A, 6-Lead Plastic Dual Flat, No Lead Package (MYY) 2x2x0.8 mm Body [TDFN] on pages 212-213.
- Drawing 198A, 8-Lead Plastic Dual Flat No Lead Package (LZ) 2x2x0.9 mm Body [VDFN] on pages 226-227.
- Drawing 2198A, 8-Lead Plastic Dual Flat No Lead Package (LZ) 2x2x0.9 mm Body Footprint [VDFN] on page 228.
- Drawing 2153A, 48-Lead Plastic Ultra Thin Quad Flat No Lead Package (MV) 6x6x0.5 mm Body Footprint [UQFN] on page 273.
- Drawing 058A, 128-Lead Plastic Low Profile Quad Flatpack (PT) 14x14x1.4 mm Body [LQFP] on pages 317-318.
- Drawing 133A, 256-Lead Plastic Metric Quad Flatpack (PQ) 28x28x3.40 mm Body [MQFP] on pages 330-331.
- Drawing 193A, 124-Terminal Very Thin Leadless Array (TL) 9x9x0.9 mm Body [VTLA] on pages 378-379.

The following drawings have been revised:

- Drawing 188B, 8-Lead Plastic Dual Flat No Lead Package (MF) 5x6x1.0 mm Body [PDFN] on pages 202-203.
- Drawing 105C, 28-Lead Plastic Quad Flat, No Lead Package (ML) 6x6 mm Body [QFN] on pages 249-250.
- Drawing 124C, 28-Lead Plastic Quad Flat, No Lead Package (MM) 6x6x0.9 mm Body [QFN-S] on pages 252-253.
- Drawing 184B, 20-Terminal Very, Very Thin Thermal Leadless Array (TL) 3x3x0.7 mm Body [WTLA] on pages 372-373.
- Drawing 187C, 36-Terminal Very Thin Thermal Leadless Array (TL) 5x5x0.9 mm Body [VTLA] on pages 374-375.
- Drawing 157C, 44-Terminal Very Thin Thermal Leadless Array (TL) 6x6x0.9 mm Body [VTLA] on pages 376-377.

APPENDIX B: CONTROL DIMENSIONS

Microchip inspects the first lot of every new package. Thereafter, one lot of each package, from each assembly site, shall be inspected yearly.

The following dimensions shall be inspected on all types of packages:

- Package Length
- Package Width
- Package Height
- Lead or Contact Width
- Lead or Contact Pitch

The following packages contain dimensions that shall be added to the inspection described above.

B.1 On Surface Mount Devices (SMD)

- § Lead Coplanarity¹
- § Standoff*
- Molded Package Length (if different from overall package length)
- Side Flash
- Foot Angle

B.2 Through-Hole

- § Lead Span*

B.3 Surface Mount Devices And Through-Hole

- Molded Package Width
- Molded Package Thickness

B.4 DFN and QFN Only

- Contact Length
- Contact to Exposed Pad
- Exposed Pad Length
- Exposed Pad Width

¹ The § symbol denotes a significant characteristic specified in the control plan.

Packaging

NOTES:



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.

Overview of Microchip Die/Wafer Support

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.

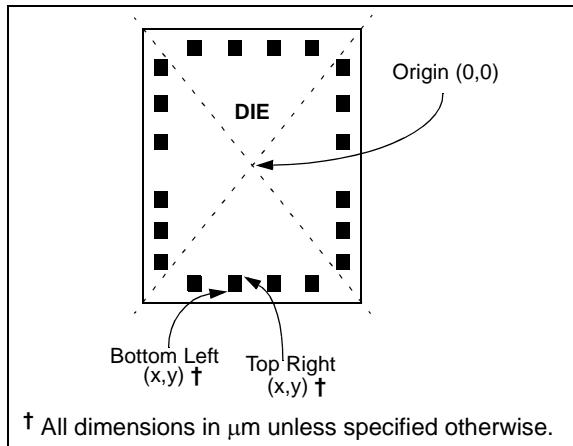
DIE MECHANICAL SPECIFICATIONS

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



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).

Overview of Microchip Die/Wafer Support

NOTES:



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