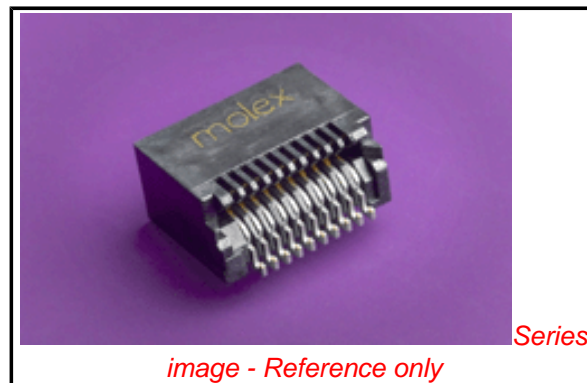


PLEASE CHECK WWW.MOLEX.COM FOR LATEST PART INFORMATION

Part Number: [0744410010](#)
Status: **Active**
Overview: [sfp_sfp host connectors](#)
Description: 0.80mm (.031") Pitch SFP, SFP Plus (SFP+) Host Connector, Z-Axis Pluggable, Right Angle, SMT, 20 Circuits, 0.76µm (30µ") Gold (Au)

Documents:

| | |
|---|--|
| 3D Model | Product Specification PS-74441-001 (PDF) |
| Application Specification (PDF) | RoHS Certificate of Compliance (PDF) |
| Drawing (PDF) | |



Agency Certification

| | |
|-----|---------|
| CSA | LR19980 |
| UL | E29179 |

General

| | |
|----------------|---|
| Product Family | I/O Connectors |
| Series | 74441 |
| Application | Module-to-Board |
| Component Type | Receptacle |
| Overview | sfp_sfp host connectors |
| Product Name | Z-Axis Pluggable |
| Type | N/A |

Physical

| | |
|--------------------------------|--------------------------------|
| Boot Color | N/A |
| Circuits (Loaded) | 20 |
| Circuits (maximum) | 20 |
| Circuits Detail | 20 |
| Color - Resin | Black |
| Durability (mating cycles max) | 200 |
| Flammability | 94V-0 |
| Gender | Receptacle |
| Keying to Mating Part | Yes |
| Lock to Mating Part | Yes |
| Material - Metal | High Performance Alloy (HPA) |
| Material - Plating Mating | Gold |
| Material - Plating Termination | Tin |
| Material - Resin | High Temperature Thermoplastic |
| Number of Rows | 2 |
| Orientation | Right Angle |
| PCB Locator | Yes |
| PCB Retention | Yes |
| Packaging Type | Embossed Tape on Reel |
| Panel Mount | No |
| Pitch - Mating Interface (in) | 0.031 In |
| Pitch - Mating Interface (mm) | 0.80 mm |
| Pitch - Term. Interface (in) | 0.031 In |
| Pitch - Term. Interface (mm) | 0.80 mm |
| Plating min: Mating (µin) | 30.4 |
| Plating min: Mating (µm) | 0.76 |
| Plating min: Termination (µm) | 2.54 |
| Polarized to Mating Part | Yes |
| Polarized to PCB | No |
| Ports | 1 |
| Surface Mount Compatible (SMC) | Yes |

EU RoHS

**ELV and RoHS
Compliant**
REACH SVHC
 Not Reviewed
**Halogen-Free
Status**

China RoHS



**Need more information on product
environmental compliance?**

Email productcompliance@molex.com
 For a multiple part number RoHS Certificate of Compliance, [click here](#)

Please visit the [Contact Us](#) section for any non-product compliance questions.

Search Parts in this Series

[74441Series](#)

Mates With

SFP Modules

Use With

EMI Shield, [73927](#) SFP Cage, [86025](#) LC Duplex Cable Assembly, Guide Frame, [73939](#) HSSDC2 Cable Assembly

| | |
|-------------------------------|----------------|
| Temperature Range - Operating | -40°C to +85°C |
| Termination Interface: Style | Surface Mount |
| Waterproof / Dustproof | No |
| Wire Size AWG | N/A |

Electrical

| | |
|-------------------------------|-----------------|
| Current - Maximum per Contact | 0.5A |
| Grounding to Panel | Yes |
| Shielded | No |
| Voltage - Maximum | 30V AC (RMS)/DC |

Solder Process Data

| | |
|--|---------------------------|
| Duration at Max. Process Temperature (seconds) | 40 |
| Lead-free Process Capability | Reflow Capable (SMT only) |
| Max. Cycles at Max. Process Temperature | 3 |
| Process Temperature max. C | 260 |

Material Info

Reference - Drawing Numbers

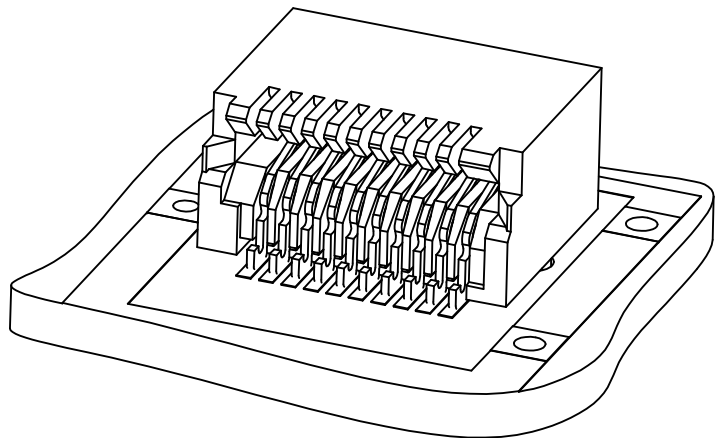
| | |
|---------------------------|--|
| Application Specification | AS-74441-001 |
| Product Specification | PS-74441-001 |
| Sales Drawing | SD-74441-001 |
| Test Summary | TS-74441-002, TS-74441-004, TS-74441-010 |

This document was generated on 05/19/2010

PLEASE CHECK WWW.MOLEX.COM FOR LATEST PART INFORMATION

SALES ASSEMBLY DRAWINGS FOR SMALL FORM-FACTOR AND Z AXIS PLUGGABLE CONNECTORS

| CKT SIZE | PART NUMBER | TOOLED | DESCRIPTION | "A" | "B" | "C" | "D" | MULTI-SOURCE AGREEMENT | CONNECTOR DRAWING | CIRCUIT BOARD DRAWING |
|----------|-------------|--------|-------------------|-----------|-------------|-------------|-------------|------------------------|-------------------|-----------------------|
| 20 | 74441-0001 | YES | PLATED PER NOTE 2 | 1.10/.043 | 11.00/.433 | 9.40/.370 | 9.60/.378 | SFP | PAGE 2 | PAGE 3 |
| | 74441-0004 | NO* | PLATED PER NOTE 2 | 0.76/.030 | | | | | | |
| | 74441-0010 | YES | PLATED PER NOTE 3 | 1.10/.043 | | | | | | |
| | 74441-0014 | NO* | PLATED PER NOTE 3 | 0.76/.030 | | | | | | |
| | 74441-0021 | YES | PLATED PER NOTE 4 | 1.10/.043 | | | | | | |
| | 74441-0031 | YES | PLATED PER NOTE 5 | 1.10/.043 | | | | | | |
| 30 | 74441-0007 | YES | PLATED PER NOTE 2 | 1.10/.043 | 15.00/.591 | 13.40/.528 | 13.60/.535 | XFP | PAGE 2 | PAGE 4 |
| | 74441-0017 | YES | PLATED PER NOTE 3 | 1.10/.043 | | | | | | |
| | 74441-0027 | YES | PLATED PER NOTE 4 | 1.10/.043 | | | | | | |
| 40 | 74441-0005 | YES | PLATED PER NOTE 2 | 1.10/.043 | 19.00/.748 | 17.40/.685 | 17.60/.693 | | PAGE 2 | PAGE 5 |
| | 74441-0015 | YES | PLATED PER NOTE 3 | 1.10/.043 | | | | | | |
| | 74441-0025 | YES | PLATED PER NOTE 4 | 1.10/.043 | | | | | | |
| 50 | 74441-0008 | YES | PLATED PER NOTE 2 | 1.10/.043 | 23.00/.906 | 21.40/.843 | 21.60/.850 | | PAGE 2 | PAGE 6 |
| | 74441-0018 | YES | PLATED PER NOTE 3 | 1.10/.043 | | | | | | |
| | 74441-0028 | YES | PLATED PER NOTE 4 | 1.10/.043 | | | | | | |
| | 74441-0038 | YES | PLATED PER NOTE 5 | 1.10/.043 | | | | | | |
| 70 | 74441-0003 | YES | PLATED PER NOTE 2 | 1.10/.043 | 31.00/1.220 | 29.40/1.157 | 29.60/1.165 | XENPAK XPAK X2 | PAGE 2 | PAGE 7 |
| | 74441-0013 | YES | PLATED PER NOTE 3 | 1.10/.043 | | | | | | |
| | 74441-0023 | YES | PLATED PER NOTE 4 | 1.10/.043 | | | | | | |
| | 74441-0033 | YES | PLATED PER NOTE 5 | 1.10/.043 | | | | | | |

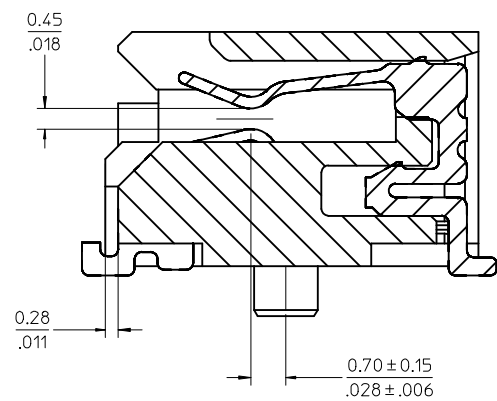
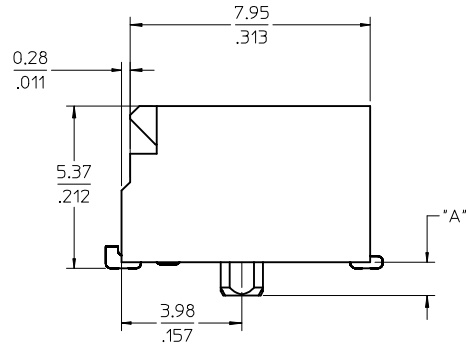
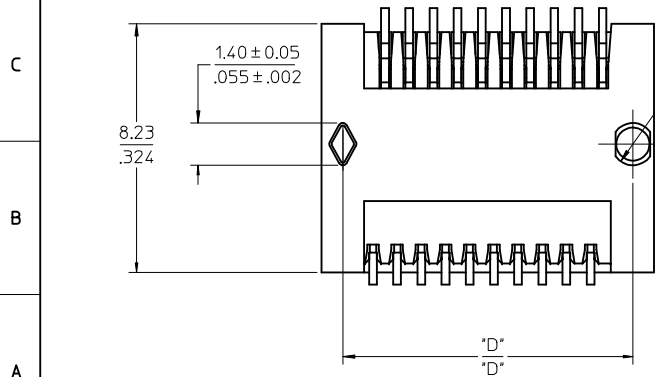
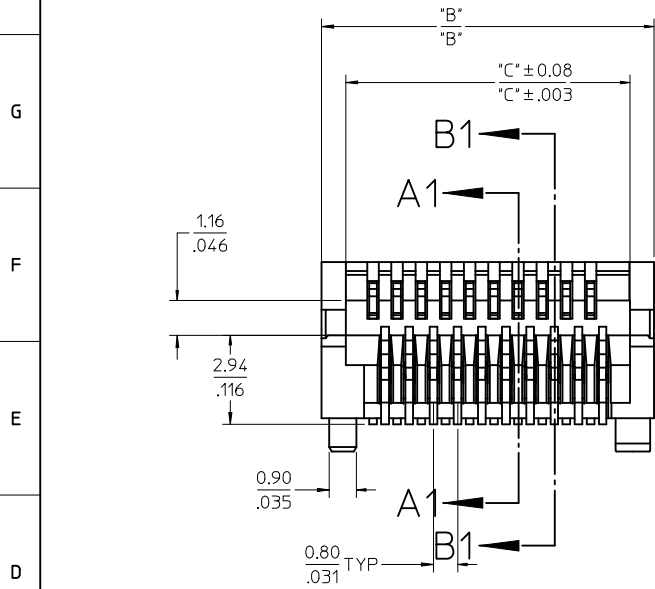
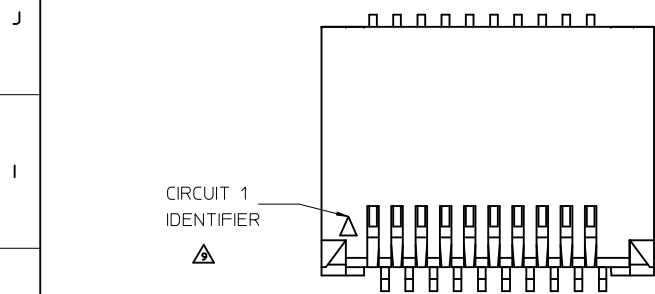


NOTES

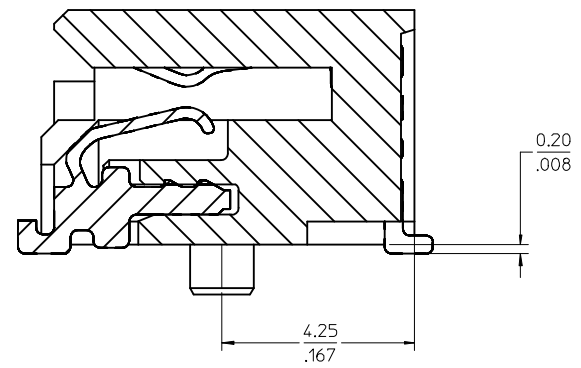
- MATERIAL:**
HOUSING - HIGH TEMPERATURE THERMOPLASTIC GLASS FILLED, UL 94V-0, BLACK
TERMINALS - COPPER ALLOY
- PLATING:**
CONTACT AREA - 0.38 μm MIN GOLD OVER 2.54 μm MIN NICKEL
SOLDER FOOT AREA - 2.54 - 5.09 μm TIN OVER 2.54 μm MIN NICKEL.
- PLATING:**
CONTACT AREA - 0.76 μm MIN GOLD OVER 2.54 μm NICKEL
SOLDER AREA - 2.54 -5.09 μm TIN OVER 2.54 μm MIN NICKEL
- PLATING:**
CONTACT AREA - 0.76 μm MIN GOLD OVER 2.54 μm NICKEL, LUBRICATED
SOLDER AREA: GOLD FLASH OVER 2.54 μm MIN NICKEL.
- PLATING:**
CONTACT AREA - 0.76 μm MIN GOLD OVER 2.54 μm NICKEL,
SOLDER AREA: GOLD FLASH OVER 2.54 μm MIN NICKEL.
- PLATING:**
CONTACT AREA - 0.38 μm MIN GOLD OVER 2.54 μm NICKEL,
SOLDER AREA: GOLD FLASH OVER 2.54 μm MIN NICKEL.
- TERMINAL SOLDER FEET TO BE COPLANAR WITHIN 0.10/.004 FOR 20, 30 AND 40 CIRCUIT CONNECTORS
TERMINAL SOLDER FEET TO BE COPLANAR WITHIN 0.15/.006 FOR 70 CIRCUIT CONNECTOR
- * CONTACT PLANT FOR MORE INFORMATION
- DATE CODE: 4 DIGIT (3 DIGIT DATE, 1 DIGIT YEAR)
- CIRCUIT 1 IDENTIFIER LOCATED ON ALL PART NUMBERS

| | | | | | | |
|---|--|---|---|-------|---|------------------------|
| ADD -0041 EC NO: UCP2009-1455 DRWN:MS BARRA 2009/01/15 CHKD:BSMART 2009/01/15 APPR:SMILLER 2009/01/16 | QUALITY SYMBOLS | GENERAL TOLERANCES (UNLESS SPECIFIED) | DIMENSION STYLE | SCALE | DESIGN UNITS | THIRD ANGLE PROJECTION |
| | ▽=0 ▽=0 | mm INCH | MM/IN | 1:1 | METRIC | |
| | | 4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.13 ± .005 1 PLACE ± 0.25 ± .010 ANGULAR ± 1/2° | DRAWN BY DATE HAVERY 00/04/06 CHECKED BY DATE KSWEENEY 00/04/06 APPROVED BY DATE MBANAKIS 00/04/06 | TITLE | SALES ASSEMBLY Z AXIS PLUGGABLE PCB CONNECTOR | |
| | DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS | SEE TABLE MATERIAL NO. DOCUMENT NO. | MOLEX INCORPORATED SD-74441-001 | | SHEET NO. | 1 OF 7 |

THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION

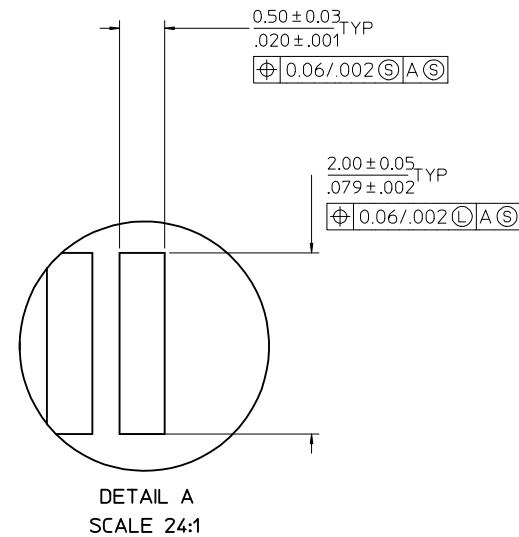
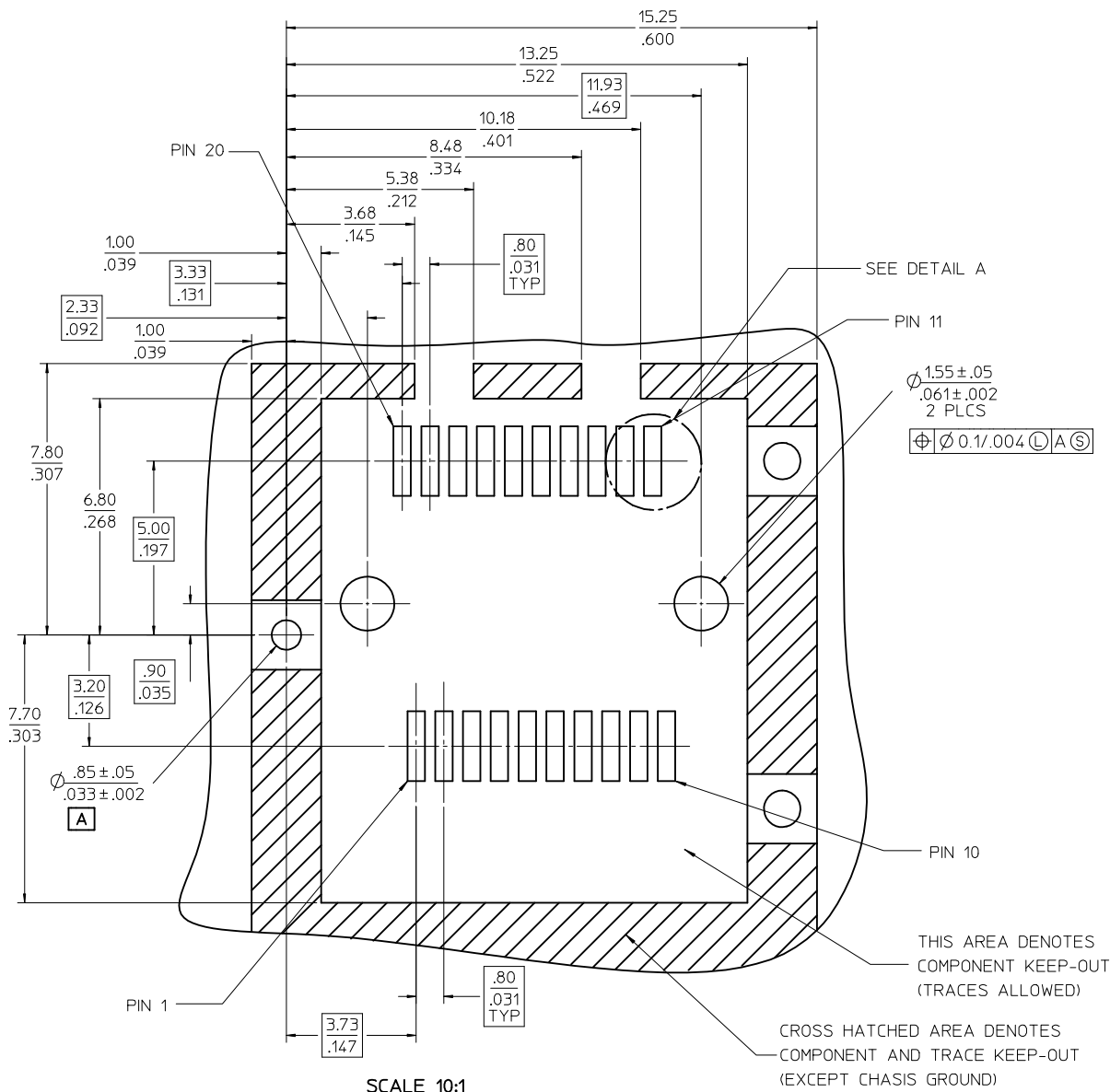


SECTION A1-A1
SCALE 12:1



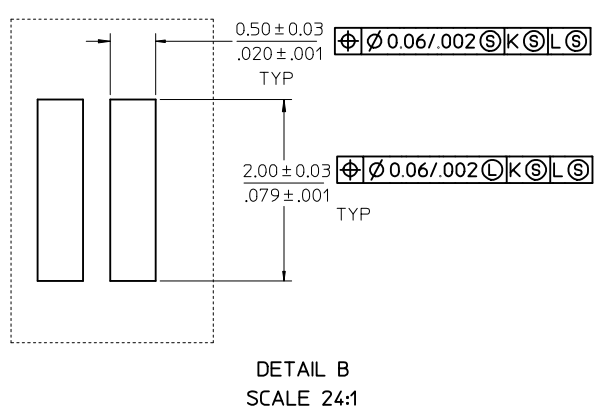
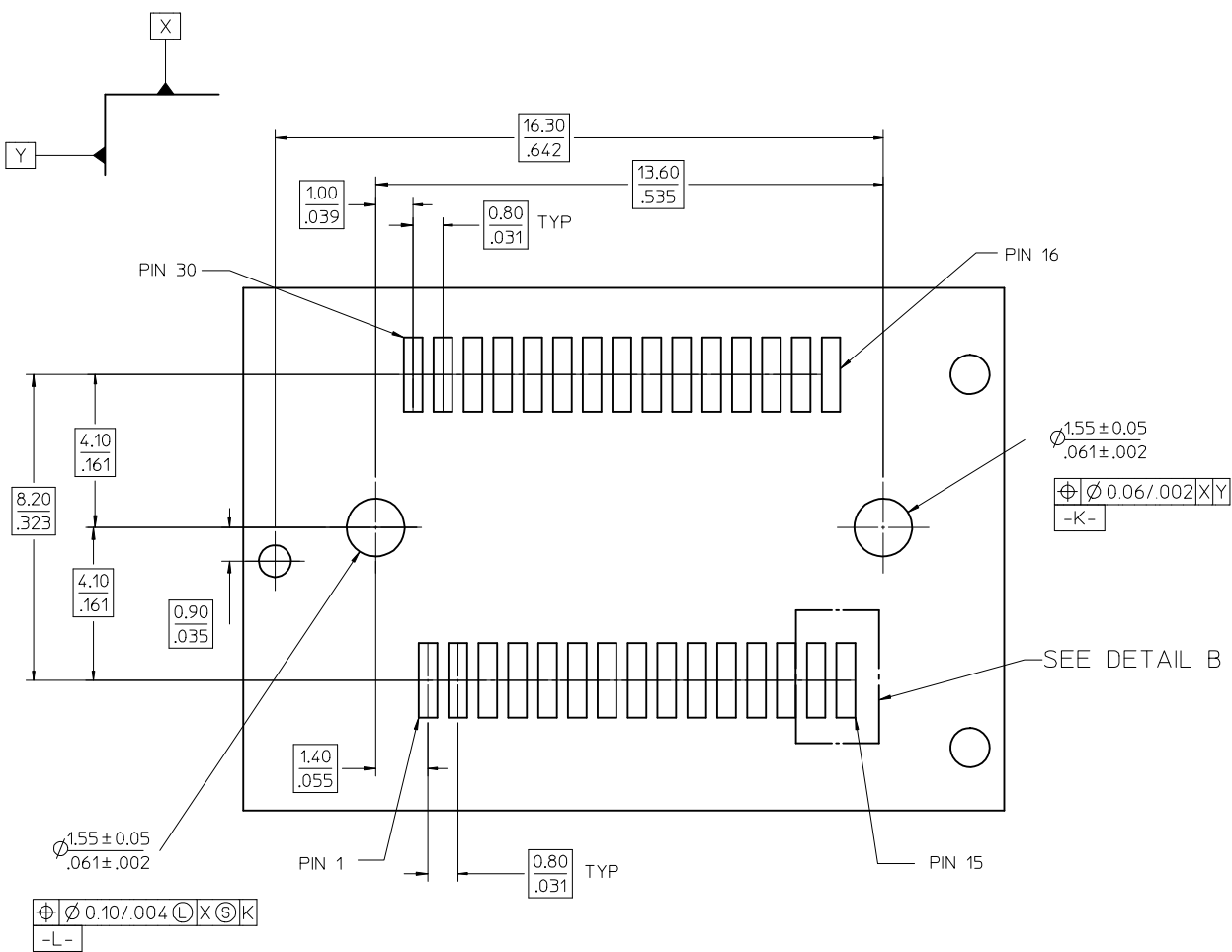
SECTION B1-B1
SCALE 12:1

| | | | | | | | | |
|---|-------------------------------|---------------------------------------|-----------------------|---|----------|---|------------------------|--|
| SEE SHEET 1 EC NO: UCP2009-1455 DRWN:MS BARRA 2009/01/15 CHKD:BSMART 2009/01/15 APPR:SMILLER 2009/01/16 | QUALITY SYMBOLS ▽=0 ▽=0 | GENERAL TOLERANCES (UNLESS SPECIFIED) | | DIMENSION STYLE | SCALE | DESIGN UNITS | THIRD ANGLE PROJECTION | |
| | | | | MM/IN | 6:1 | METRIC | | |
| | | 4 PLACES ± --- ± --- | 3 PLACES ± --- ± --- | DRAWN BY | DATE | SALES ASSEMBLY Z AXIS PLUGGABLE PCB CONNECTOR | | |
| | | 2 PLACES ± 0.13 ± .005 | 1 PLACE ± 0.25 ± .010 | HAVERY | 00/04/06 | | | |
| ANGULAR ±1/2° | | APPROVED BY | DATE | MOLEX INCORPORATED SD-74441-001 | | | | |
| DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS | | MBANAKIS | 00/04/06 | | | | | |
| | | SEE TABLE | | DOCUMENT NO. | | SHEET NO. | | |
| | | C | | THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION | | 2 OF 7 | | |



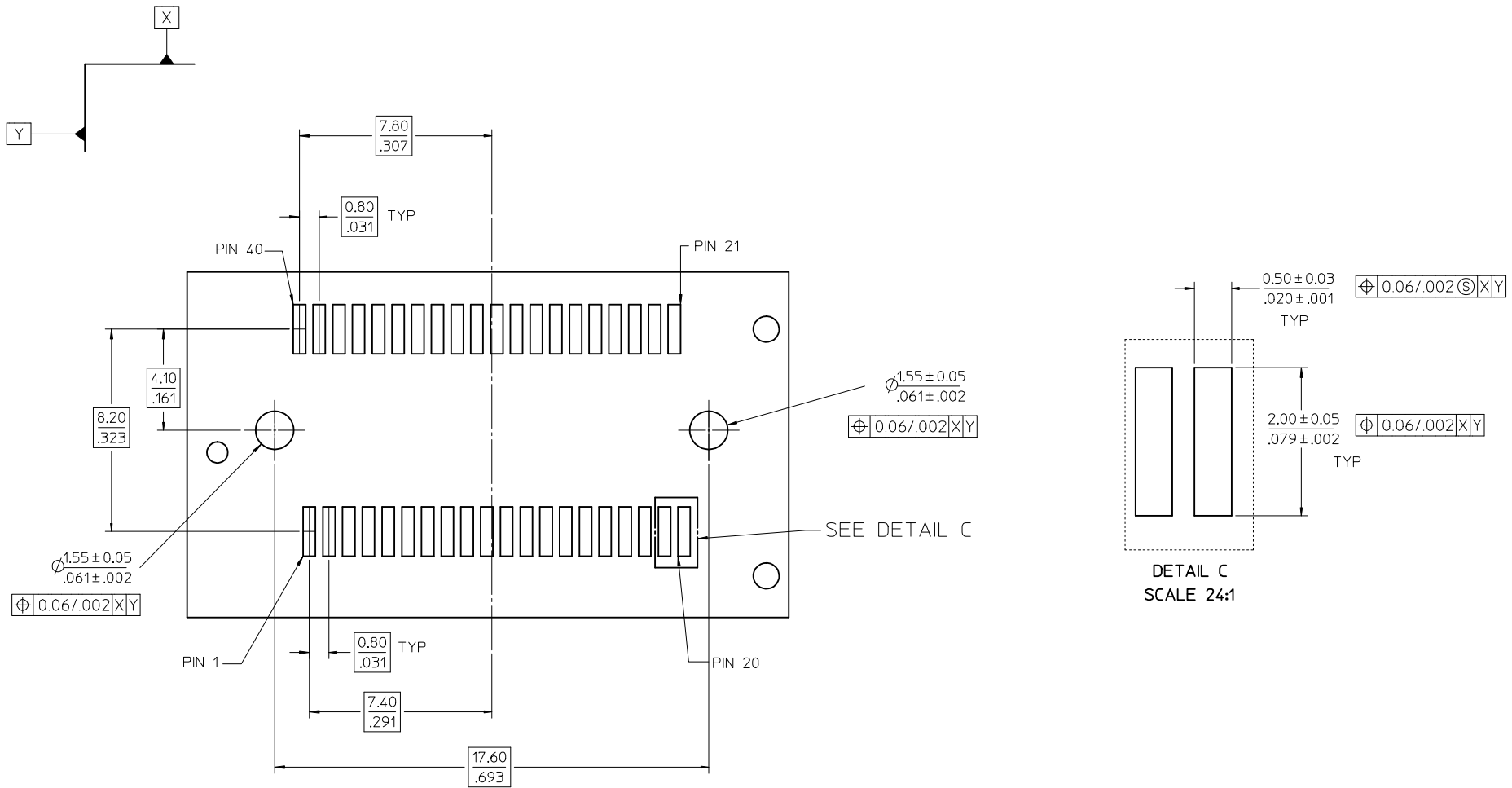
20 CIRCUIT MOTHER BOARD RECOMMENDED PCB LAYOUT

| SEE SHEET 1 EC NO: UCP2009-1455 DRAWN BY: DRWINNISI BARRA CHECKED BY: CHKDBSMART APPR: SMILLER DATE: 2009/01/15 DATE: 2009/01/15 DATE: 2009/01/16 | QUALITY SYMBOLS ▽=0 ▽=0 | GENERAL TOLERANCES (UNLESS SPECIFIED) <table border="1"> <thead> <tr> <th></th> <th>mm</th> <th>INCH</th> </tr> </thead> <tbody> <tr> <td>4 PLACES</td> <td>± .005</td> <td>± .0005</td> </tr> <tr> <td>3 PLACES</td> <td>± .005</td> <td>± .0005</td> </tr> <tr> <td>2 PLACES</td> <td>± 0.13</td> <td>± .005</td> </tr> <tr> <td>1 PLACE</td> <td>± 0.25</td> <td>± .010</td> </tr> </tbody> </table> | | mm | INCH | 4 PLACES | ± .005 | ± .0005 | 3 PLACES | ± .005 | ± .0005 | 2 PLACES | ± 0.13 | ± .005 | 1 PLACE | ± 0.25 | ± .010 | DIMENSION STYLE MM/IN | SCALE 8:1 | DESIGN UNITS METRIC | THIRD ANGLE PROJECTION |
|---|--|--|--|----|------|----------|--------|---------|----------|--------|---------|----------|--------|--------|---------|--------|--------|---------------------------------|---------------------|-------------------------------|------------------------|
| | | mm | INCH | | | | | | | | | | | | | | | | | | |
| | 4 PLACES | ± .005 | ± .0005 | | | | | | | | | | | | | | | | | | |
| | 3 PLACES | ± .005 | ± .0005 | | | | | | | | | | | | | | | | | | |
| 2 PLACES | ± 0.13 | ± .005 | | | | | | | | | | | | | | | | | | | |
| 1 PLACE | ± 0.25 | ± .010 | | | | | | | | | | | | | | | | | | | |
| DRAWN BY HAVERY DATE 00/04/06 | CHECKED BY KSWEENEY DATE 00/04/06 | APPROVED BY MBANAKIS DATE 00/04/06 | TITLE SALES ASSEMBLY Z AXIS PLUGGABLE PCB CONNECTOR | | | | | | | | | | | | | | | | | | |
| MATERIAL NO. SEE TABLE | | | DOCUMENT NO. SD-74441-001 | | | | | | | | | | | | | | | | | | |
| DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS | | | THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION | | | | | | | | | | | | | | | | | | |



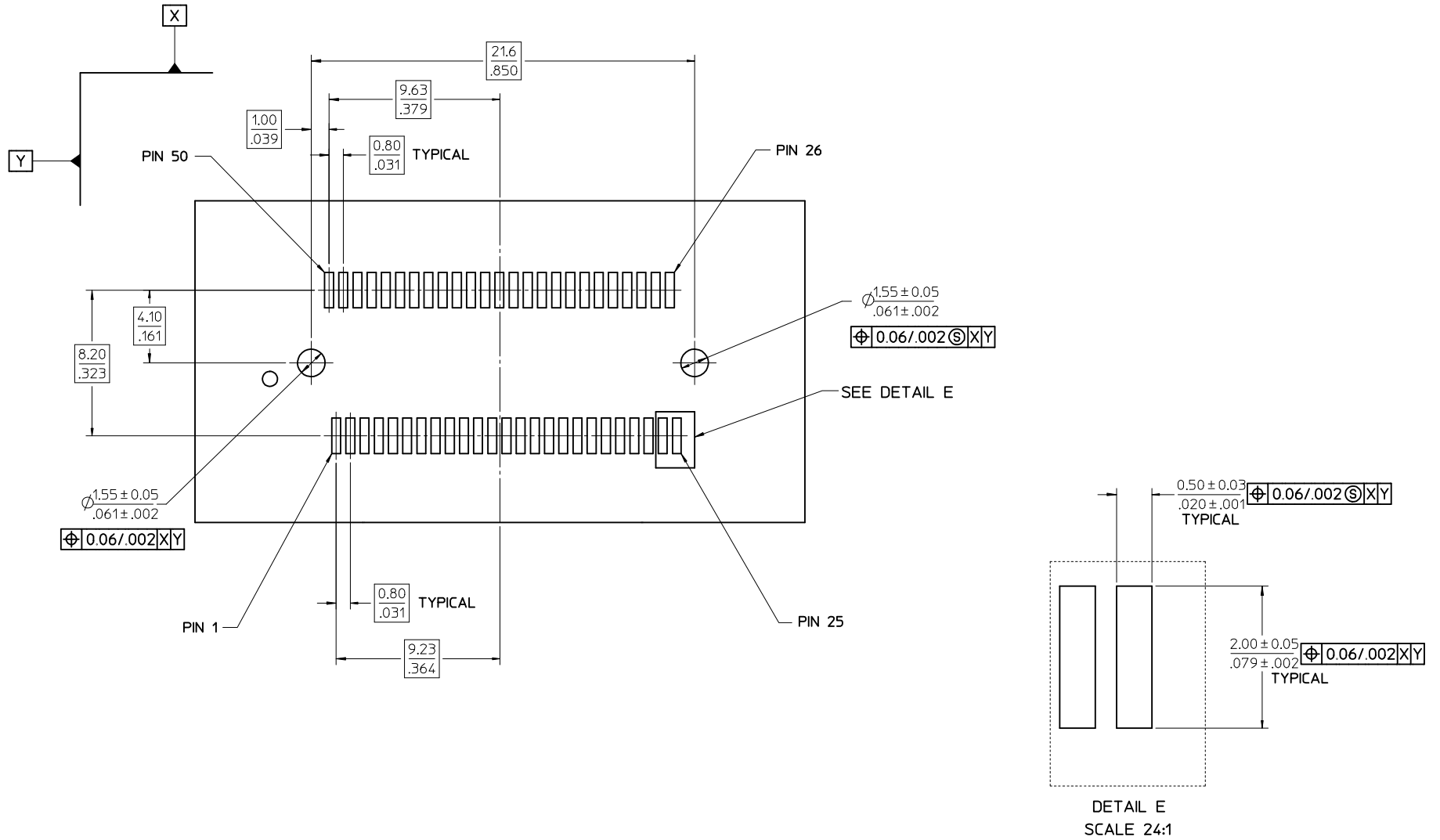
30 CIRCUIT MOTHER BOARD
RECOMMENDED PCB LAYOUT

| | | | | | | | | | | |
|---|--|---|---|---|--|---|-------------------------------|------------------------|--|--|
| SEE SHEET 1 EC NO: UCP2009-1455 2009/01/15 DRWINMS BARRA 2009/01/15 CHYKD:BSMART 2009/01/16 JAPPR:SMILLER | DESCRIPTION 30 CIRCUIT MOTHER BOARD RECOMMENDED PCB LAYOUT | QUALITY SYMBOLS $\nabla=0$ $\nabla=0$ | GENERAL TOLERANCES (UNLESS SPECIFIED) | | DIMENSION STYLE MM/IN | SCALE 6:1 | DESIGN UNITS METRIC | THIRD ANGLE PROJECTION | | |
| | | 4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.13 ± .005 1 PLACE ± 0.25 ± .010 ANGULAR ± 1/2° | mm INCH | DRAWN BY HAVERY DATE 00/04/06 | CHECKED BY KSWEENEY DATE 00/04/06 | TITLE SALES ASSEMBLY Z AXIS PLUGGABLE PCB CONNECTOR | | | | |
| | | DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS | MATERIAL NO. SEE TABLE | APPROVED BY MBANAK I S DATE 00/04/06 | MOLEX INCORPORATED | DOCUMENT NO. SD-74441-001 | | | | |
| | | SIZE C | THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION | | | | | | | |



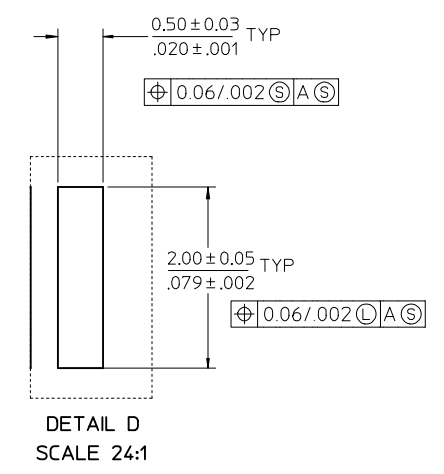
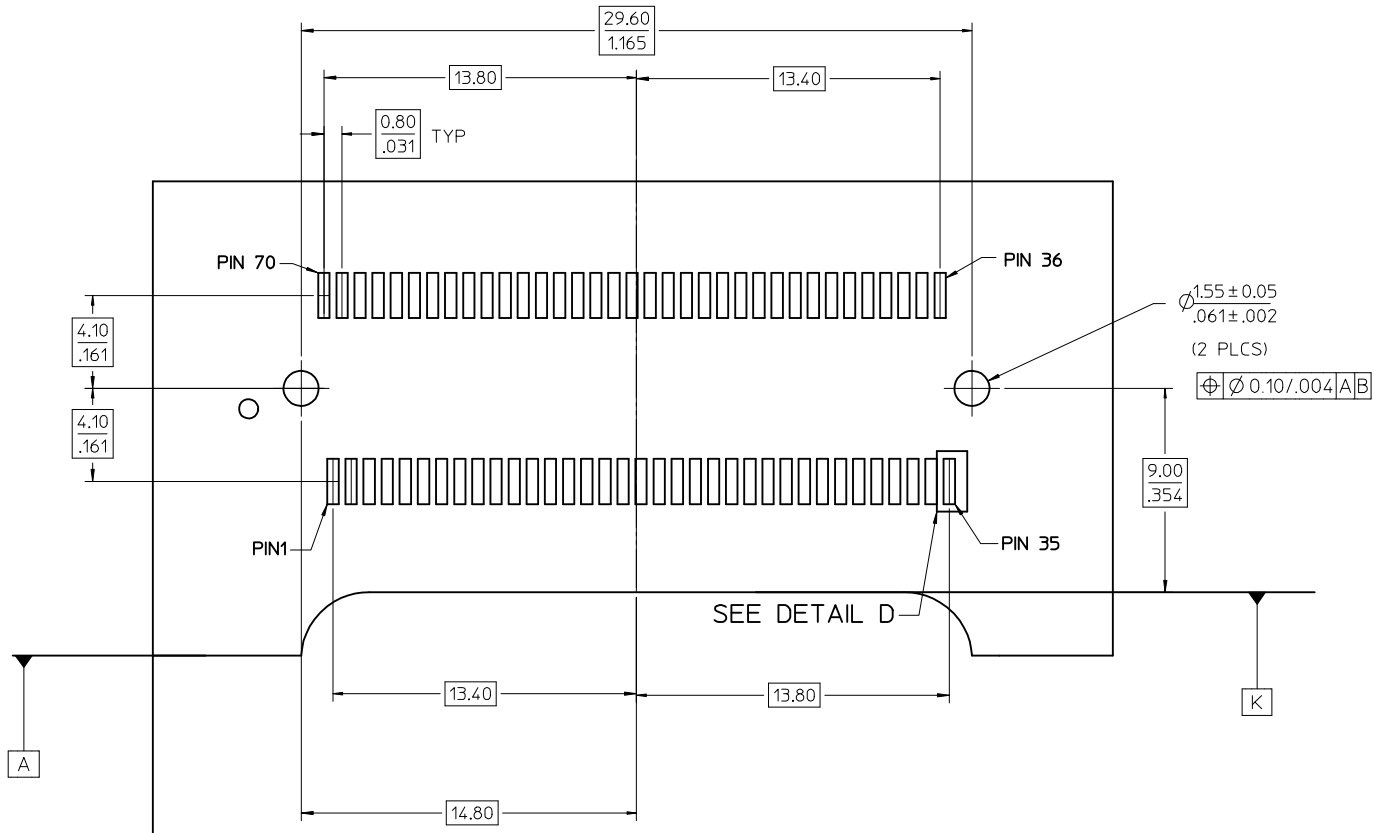
40 CIRCUIT MOTHER BOARD
RECOMMENDED PCB LAYOUT

| SEE SHEET 1 EC NO: UCP2009-1455 DRWN:MSI BARRA 2009/01/15 CHKD:BSMART 2009/01/15 APPR:SMILLER 2009/01/16 | QUALITY SYMBOLS ▽=0 ▽=0 | GENERAL TOLERANCES (UNLESS SPECIFIED) | | DIMENSION STYLE MM/IN | SCALE 6:1 | DESIGN UNITS METRIC | THIRD ANGLE PROJECTION | | | | | | | | | | | | | | | |
|---|-------------------------------|---|----------------------------------|-------------------------------------|----------------------------|-------------------------------|------------------------|--------|----------|-------|--------|----------|--------|--------|---------|--------|--------|--------------------|------------------|--|--|--|
| | | <table border="1"> <thead> <tr> <th></th> <th>mm</th> <th>INCH</th> </tr> </thead> <tbody> <tr> <td>4 PLACES</td> <td>± .13</td> <td>± .005</td> </tr> <tr> <td>3 PLACES</td> <td>± .13</td> <td>± .005</td> </tr> <tr> <td>2 PLACES</td> <td>± 0.25</td> <td>± .010</td> </tr> <tr> <td>1 PLACE</td> <td>± 0.25</td> <td>± .010</td> </tr> </tbody> </table> | | mm | INCH | 4 PLACES | ± .13 | ± .005 | 3 PLACES | ± .13 | ± .005 | 2 PLACES | ± 0.25 | ± .010 | 1 PLACE | ± 0.25 | ± .010 | DRAWN BY HAVERY | DATE 00/04/06 | SALES ASSEMBLY Z AXIS PLUGGABLE PCB CONNECTOR | | |
| | | | mm | INCH | | | | | | | | | | | | | | | | | | |
| | | 4 PLACES | ± .13 | ± .005 | | | | | | | | | | | | | | | | | | |
| 3 PLACES | ± .13 | ± .005 | | | | | | | | | | | | | | | | | | | | |
| 2 PLACES | ± 0.25 | ± .010 | | | | | | | | | | | | | | | | | | | | |
| 1 PLACE | ± 0.25 | ± .010 | | | | | | | | | | | | | | | | | | | | |
| ANGULAR ±1/2° | CHECKED BY KSWEENEY | DATE 00/04/06 | | | | | | | | | | | | | | | | | | | | |
| DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS | APPROVED BY MBANAKIS | DATE 00/04/06 | MATERIAL NO. SEE TABLE | DOCUMENT NO. SD-74441-001 | SHEET NO. 5 OF 7 | MOLEX INCORPORATED | | | | | | | | | | | | | | | | |
| THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION | | | | | | | | | | | | | | | | | | | | | | |



50 CIRCUIT MOTHER BOARD
RECOMMENDED PCB LAYOUT

| SEE SHEET 1 EC NO: UCP2009-1455 DRAWN BY: IBARRA 2009/01/15 CHKD: BSMART 2009/01/15 APPR: SMILLER 2009/01/16 | QUALITY SYMBOLS ▽=0 ▽=0 | GENERAL TOLERANCES (UNLESS SPECIFIED) <table border="1"> <thead> <tr> <th></th> <th>mm</th> <th>INCH</th> </tr> </thead> <tbody> <tr> <td>4 PLACES</td> <td>± .---</td> <td>± .---</td> </tr> <tr> <td>3 PLACES</td> <td>± .---</td> <td>± .---</td> </tr> <tr> <td>2 PLACES</td> <td>± 0.13</td> <td>± .005</td> </tr> <tr> <td>1 PLACE</td> <td>± 0.25</td> <td>± .010</td> </tr> </tbody> </table> ANGULAR ±1/2° | | mm | INCH | 4 PLACES | ± .--- | ± .--- | 3 PLACES | ± .--- | ± .--- | 2 PLACES | ± 0.13 | ± .005 | 1 PLACE | ± 0.25 | ± .010 | DIMENSION STYLE MM/IN DRAWN BY: HAVERY DATE: 00/04/06 CHECKED BY: KSWEENEY DATE: 00/04/06 APPROVED BY: MBANAKIS DATE: 00/04/06 | SCALE 6:1 | DESIGN UNITS METRIC | THIRD ANGLE PROJECTION |
|--|-------------------------------|--|--------------------|------------------------------|---------------------|----------|--------|--------|----------|--------|--------|----------|--------|--------|---------|--------|--------|--|--------------|------------------------|------------------------|
| | | mm | INCH | | | | | | | | | | | | | | | | | | |
| | 4 PLACES | ± .--- | ± .--- | | | | | | | | | | | | | | | | | | |
| | 3 PLACES | ± .--- | ± .--- | | | | | | | | | | | | | | | | | | |
| 2 PLACES | ± 0.13 | ± .005 | | | | | | | | | | | | | | | | | | | |
| 1 PLACE | ± 0.25 | ± .010 | | | | | | | | | | | | | | | | | | | |
| DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS | MATERIAL NO. SEE TABLE | TITLE SALES ASSEMBLY Z AXIS PLUGGABLE PCB CONNECTOR | MOLEX INCORPORATED | DOCUMENT NO. SD-74441-001 | SHEET NO. 6 OF 7 | | | | | | | | | | | | | | | | |
| | SIZE C | THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |



70 CIRCUIT MOTHER BOARD
RECOMMENDED PCB LAYOUT

| | | | | | | | |
|---|-----------------------------------|--|--|--|---------------------|--------------|--|
| SEE SHEET 1 EC NO: UCP2009-1455 DRAWN BY: DRWN:MS.BARRA 2009/01/15 CHECKED BY: CHKD:BSMART 2009/01/15 APPR:SMILLER 2009/01/16 | DESCRIPTION REVISIONS REV 1 | QUALITY SYMBOLS | GENERAL TOLERANCES (UNLESS SPECIFIED) | DIMENSION STYLE | SCALE | DESIGN UNITS | THIRD ANGLE PROJECTION |
| | | ▼=0 ▽=0 | mm INCH 4 PLACES ± --- ± --- 3 PLACES ± --- ± --- 2 PLACES ± 0.13 ± .005 1 PLACE ± 0.25 ± .010 ANGULAR ±1/2° | MM/IN DRAWN BY: HAVERY DATE: 00/04/06 CHECKED BY: KSWEENEY DATE: 00/04/06 APPROVED BY: MBANAKIS DATE: 00/04/06 | 6:1 | METRIC | TITLE: SALES ASSEMBLY Z AXIS PLUGGABLE PCB CONNECTOR |
| | | DRAFT WHERE APPLICABLE MUST REMAIN WITHIN DIMENSIONS | MATERIAL NO. SEE TABLE | MOLEX INCORPORATED DOCUMENT NO. SD-74441-001 | SHEET NO. 7 OF 7 | | |
| | | THIS DRAWING CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INCORPORATED AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION | | | | | |