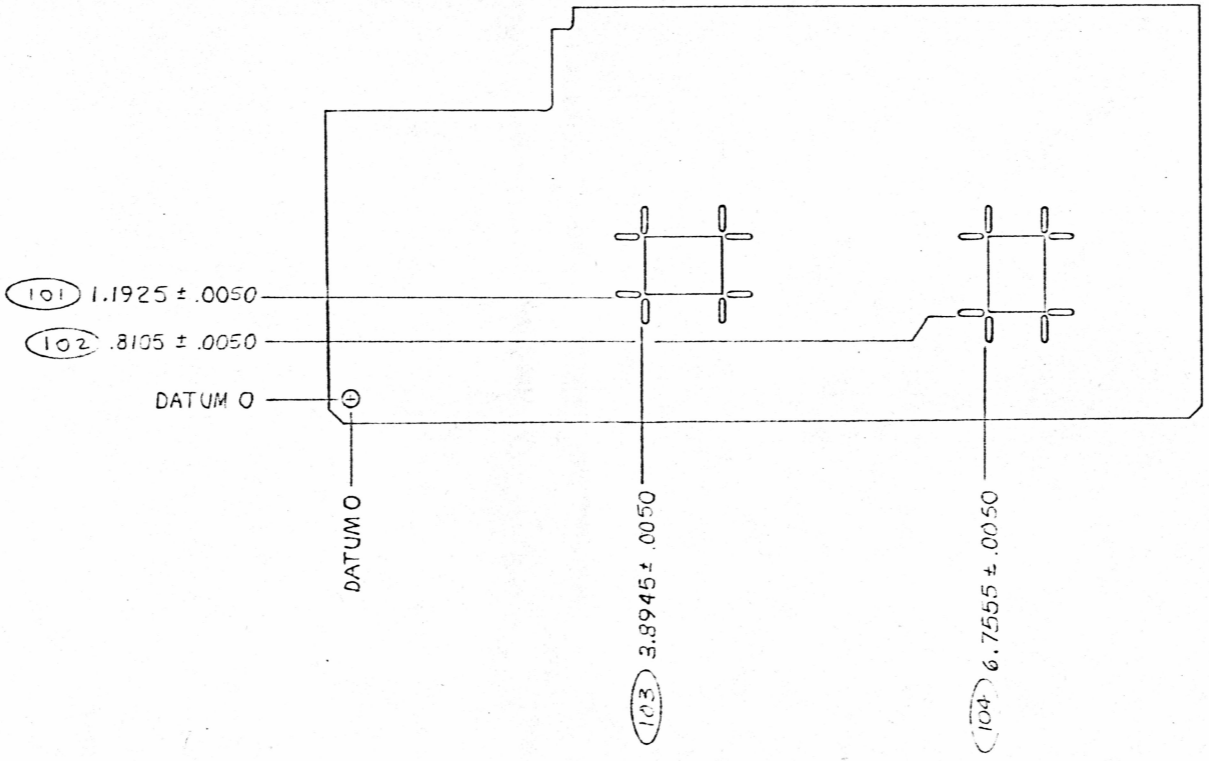


NOTES: UNLESS OTHERWISE SPECIFIED

- 01. EXTERNAL TOOLING HOLE DIMENSIONS.
- 02. MINIMUM ANNULAR RING .001 EXCEPT BREAK OUT PERMITTED ON TRIMMED PADS.
- 03. MAX. INTERNAL RADIUS .030 MAX. EXTERNAL RADIUS .063
- 04. NO DEBURR REQUIRED.
- 05. CRAZING AND DELAMINATION WITHIN A MAX. OF .030 BOARD PERIMETER SHALL BE ACCEPTABLE.
- 06. HOLE LOCATION (A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, X, Y, Z) (RFS), OR (A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, X, Y, Z) (MMC).
- 07. ALL HOLES NOT DIMENSIONED ARE ON .025 INCH GRID INCREMENTS IN RELATION TO DATUM O.
- 08. DECIMAL HOLE DIAMETERS AND HOLE TOLERANCES GOVERN HOLE SIZE. NUMBERS IN PARENTHESIS ARE FOR REFERENCE ONLY.
- 09. FINISHED ARTWORK CONDUCTOR WIDTH AND SPACING TO BE AS SHOWN ON MASTER PATTERN ± .004.
- 10. BOARD WARP OR TWIST SHALL NOT EXCEED .010 INCH PER INCH LENGTHWISE AND SHALL NOT EXCEED .010 INCH PER INCH CROSSWISE.
- 11. NO CLEARANCE REQUIRED FROM CONDUCTOR TO EDGE OF BOARD AND SLOTS.
- 12. MATERIAL SHALL BE .062 THK NEMA GRADE FR-4 OR G-10 WITH ONE OZ. COPPER BOTH SIDES.
- 13. PROCESSES: TIN LEAD 60/40 PLATE, .0001 THK MIN. TO .0003 THK MAX. PER QQ-5-571. "REFLOWED" BEFORE SOLDER MASK IS APPLIED.
- 14. SOLDER MASK SHALL BE SCREENED ON BOTH SIDES USING PC 401 OR QUALIFIED SUBSTITUTE. COLOR TO BE GREEN.
- 15. SOLDER MASK IS PERMITTED TO BLEED ON PADS OF CONDUCTOR SIDE WHERE PADS ARE TRIMMED AND ON COMPONENT SIDE OF BOARD.
- 16. MARK PER ANS I Y32-16-1968 METHOD SILK SCREEN HEIGHT PER ARTWORK PROVIDED. COLOR CONTRASTING (100% METHOD F, CLASS 1).
- 17. REGISTRATION MARKS TO BE USED FOR POSITIONING MARKING AT HOLES SHOWN.
- 18. THIS PWB IS AN UL RECOGNIZED COMPONENT AND SUCH AS MUST DISPLAY THE VENDOR'S MARK RECOGNIZED BY UL IN THE AREA OF THE PWB INDICATED.
- 19. SOLDER MASK ALLOWED TO BLEED A MAX. OF .005 ONTO THE PAD.
- 20. NO ANNULAR RING REQUIREMENTS ON OVAL PADS.
- 21. SOLDER MASK PERMITTED TO COVER THE LEAD PLATED COPPER AREAS GREATER THAN .250 INCH.
- 22. ALL HOLES TO BE WITHIN 0.014 INCH TRUE POSITION OF DATUM O WHEN PINNED TO PLANE A.
- 23. ELECTROLESS NICKEL PLATE PER CL.1, CLASS B (F-38, METHOD 2) THICKNESS TO BE .0003 MIN. OR ELECTROPLATE A LOW STRESS NICKEL .0003 MIN. THK. FREE FROM VISIBLE BLISTERS, PITS, NODULES, CRACKS, OR OTHER DEFECTS. IPC TAPE TEST SHOW NO SEPARATION OF SUBSEQUENT TOP COAT.
- 24. ELECTROPLATE GOLD PER MIL-G-45204, CL. II OR F-34, CL 2. .00005 MIN. THK. MIN. GOLD PLATING THICKNESS ON FINISHED PCB SHALL BE .00005 GOLD SHALL BE ADHERENT (IPC TAPE TEST), HAVE UNIFORM COVERAGE AND GOLD COLOR WITH NO EVIDENCE OF PURSITY.

- 25. GOLD PLATING ON KEYPADS AND DISPLAY PADS ONLY.
- 26. SOLDER MASK ALLOWED TO COVER FEED-THRU HOLES.
- 27. ALL BOARDS ARE TO BE MARKED WITH AN IDENTIFYING CAVITY NUMBER.
- 28. THE QUALITY OF THIS PRODUCT SHALL SATISFY ALL OF THE PREFERRED OR ACCEPTABLE CHARACTERISTICS FOR CLASS 2 (GENERAL-INDUSTRIAL) PRINTED CIRCUIT BOARDS OF THIS TYPE, DESCRIBED IN IPC-A-600C. SOLDER MASK QUALITY SHALL SATISFY CLASS 2 PERFORMANCE REQUIREMENTS DESCRIBED IN IPC-SM-240.
- 29. INTERNAL INDEXING HOLES (SYMBOLIZED  $\diamond$ ) MAY BE EITHER UNSUPPORTED OR PLATED-THRU AT VENDOR OPTION.
- 30. 100% ELECTRICAL TESTING REQUIRED OF VENDOR.

| REVISIONS |     |  |          |          |
|-----------|-----|--|----------|----------|
| ZONE      | LTR | DESCRIPTION  | DATE     | APPROVED |
| A         |     | ECN 103960 Wolfgang Bohannon 9-13-82<br>1. ALL LAYERS AFFECTED   | 12/2/82  |          |
| B         |     | ECN 105393 Karen Flunkharty 2-17-83<br>1) CHANGE NOTE 10.<br>2) CHANGE NOTE 13   | 2-17-83  |          |
| C         |     | ECN 105760 Wolfgang Bohannon 3/22/83<br>1. CHANGED DIM 48 AND 38.  | 4-1-83   |          |
| D         |     | ECN 106825 Wolfgang Bohannon 4/8/83<br>1. ADDITIONAL CLEARANCE BY KEY 5, 6, 7 AND Y.   | 4/14/83  |          |
| E         |     | ECN 106848 Wolfgang Bohannon 4/16/83<br>1. CHANGE NOTE 13.   | 4/16/83  |          |
| F         |     | ECN 102775 Wolfgang Bohannon 4/1/83<br>CHG DIMS 38 & 43 TO HEXAGONS FOR REF.   | 4/2/83   |          |
| G         |     | ECN 107191 Wolfgang Bohannon 6/6/83<br>1) CHG NOTE 14 2) CHG TOOLING HOLE TO .128 ± .002 3) ADD NOTE 27 4) ADD CLEARANCE TO KEYS Z, X, M, G, K, U 5) CHG TITLE BLOCK | 6/2/83   |          |
| H         |     | ECN 107198 Karen Flunkharty 3-17-83<br>ADD DIMS TO SHT 1. CHG SHT 2 DIM IDENTIFIERS TO 200 SERIES OF #'S.  | 3-17-83  |          |
| J         |     | ECN 107919 Karen Flunkharty 7-19-83<br>ADD NOTE 28.  | 7-19-83  |          |
| K         |     | ECN 107922 Dan Russ 11/18/83<br>ADDED NOTES 29 & 30, CHANGED TO... ON DIM IDENT. 101-104, CHANGED HOLE SCHEDULE TO ADD VENDOR'S OPTION INDEXING HOLE                 | 11/22/83 |          |



SEE SH. 2.

| LTR | FINISHED HOLE DIA       | REMARKS      |
|-----|-------------------------|--------------|
| E   | .046 ± .002             |              |
| D   | .039 ± .002             |              |
| C   | .031                    |              |
| B   | .125 ± .006             | INTL TOOLING |
| A   | SHOP OPTION             | EXTL TOOLING |
|     | UNSUPPORTED PLATED THRU |              |
|     | ± .004                  | ± .007       |
|     | ± .001                  | ± .003       |

HOLE SCHEDULE

| INVENTORY CONTROL NUMBER | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U | V | W | X | Y | Z |
|--------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THIS DRAWING             | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| HOLE CONFIGURATION       | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| DRILL DECK               | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LAYER 1 (COMP. SIDE)     | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| LAYER 2 (COND. SIDE)     | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MARKING                  | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CONDUCTOR SIDE           | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SOLDER MASK              | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| COMPONENT SIDE           | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| SOLDER MASK              | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| DIMENSION IDENTIFIERS |          |
|-----------------------|----------|
| LAST USED             | NOT USED |
| 57                    |          |

UNLESS OTHERWISE SPECIFIED:  
 • DIMENSIONS ARE IN INCHES  
 • TOLERANCES:  
 ANGLES ± 5°  
 3 PLACE DECIMALS ± 0.10  
 2 PLACE DECIMALS ± 0.2  
 • DIMENSIONING IN ACCORDANCE WITH ANS I Y14.5

DATE: 3/29/84  
 DRAWN: Wolfgang Bohannon  
 CHECKED: Dan Russ  
 ELECT ENG: [Signature]  
 TOOLING ENG: [Signature]  
 MFG ENG: [Signature]  
 PRODUCT ENG: [Signature]  
 DRG. ACTIVITY RELEASE: [Signature]

TEXAS INSTRUMENTS INCORPORATED  
 CALCULATOR PRODUCTS DIVISION

DISPLAY PRINTED CIRCUIT BOARD, PRODUCT 477

SIZE: MP 3L  
 DRAWING NO: D 1044503

D 1044503



D

D

C

C

B

B

A

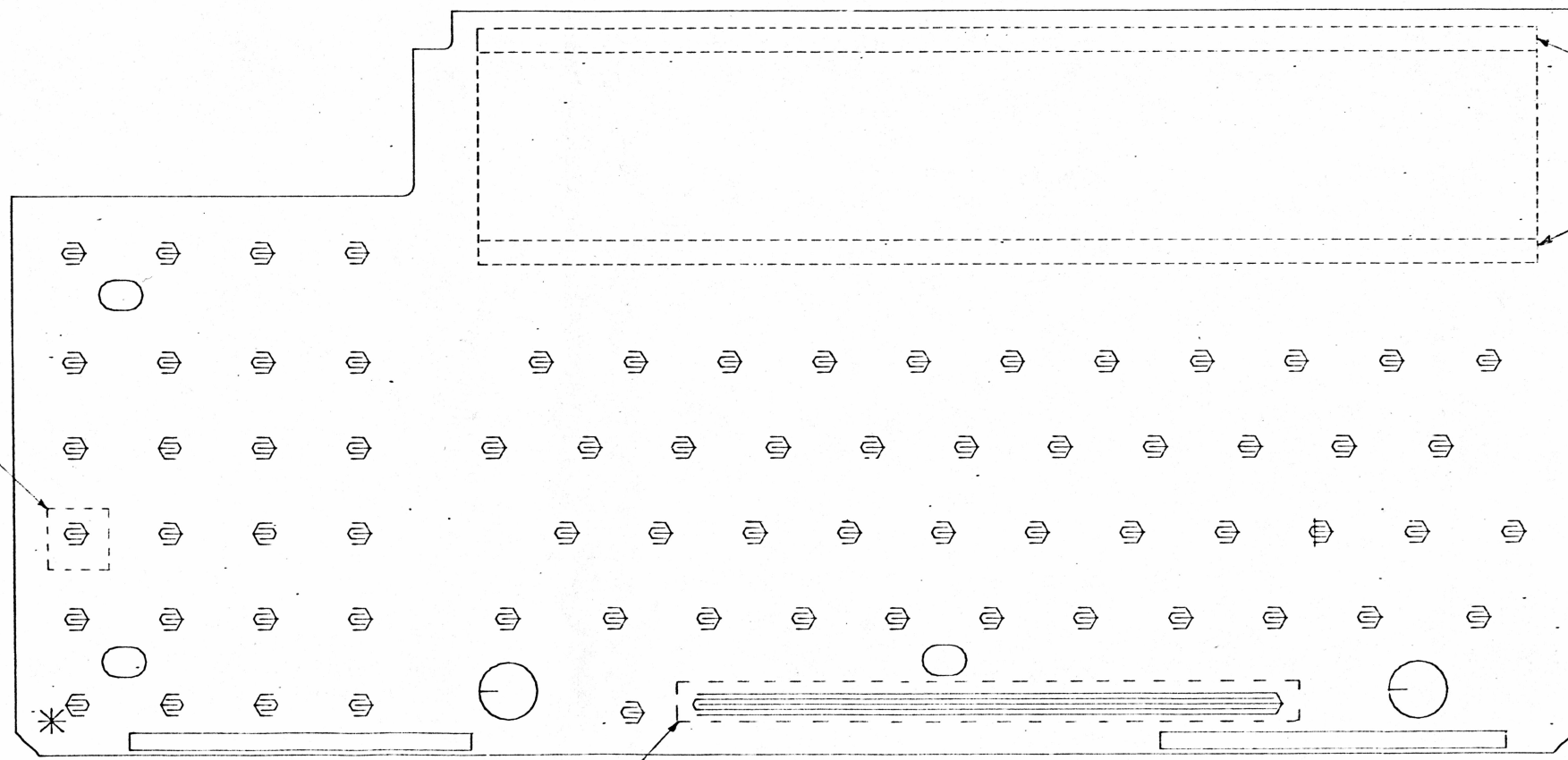
A

25  
69 PL.

25

25

CONDUCTOR SIDE  
(LAYER 2)



| DIMENSION IDENT. NUMBER |          |
|-------------------------|----------|
| USED                    | NOT USED |
|                         |          |