

## REVISIONS

| LTR | DESCRIPTION  | DATE (YR-MO-DA) | APPROVED           |
|-----|--|-----------------|--------------------|
| A   | Made technical changes in Table I. Editorial changes throughout. ljp                 | 92-01-27        | Monica L. Poelking |
| B   | Changes in accordance with NOR 5962-R268-92. tvn                                     | 92-08-04        | Monica L. Poelking |
| C   | Add package CDFP4-F16. Use new boilerplate. ljs                                      | 98-02-04        | Raymond Monnin     |
| D   | Figure 4 modified to be consistent with Table I. ljs                                 | 98-08-12        | Raymond Monnin     |
| E   | Add V <sub>CC</sub> positive supply voltage specifications to para. 1.3 and 1.4. ljs | 98-10-20        | Raymond Monnin     |

The original first page of this drawing has been replaced.

|  |    |                                   |   |   |   |   |                           |   |                   |   |   |    |    |    |
|--|----|-----------------------------------|---|---|---|---|---------------------------|---|-------------------|---|---|----|----|----|
| REV  |    |                                   |   |   |   |   |                           |   |                   |   |   |    |    |    |
| SHEET  |    |                                   |   |   |   |   |                           |   |                   |   |   |    |    |    |
| REV  | E  |                                   |   |   |   |   |                           |   |                   |   |   |    |    |    |
| SHEET  | 15 |                                   |   |   |   |   |                           |   |                   |   |   |    |    |    |
| REV STATUS<br>OF SHEETS  |    | REV                               | E | E | E | E   | E                         | E | E                 | E | E | E  | E  | E  |
|  |    | SHEET                             | 1 | 2 | 3 | 4   | 5                         | 6 | 7                 | 8 | 9 | 10 | 11 | 12 |
| PMIC N/A   |    | PREPARED BY<br>David Queenan      |   |   |   | DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216              |                           |   |                   |   |   |    |    |    |
| <b>STANDARD<br/>MICROCIRCUIT<br/>DRAWING</b>   |    | CHECKED BY<br>D. A. Dicenzo       |   |   |   | MICROCIRCUIT, DIGITAL, TTL-TO-ECL<br>TRANSLATOR, MONOLITHIC SILICON |                           |   |                   |   |   |    |    |    |
| THIS DRAWING IS AVAILABLE<br>FOR USE BY ALL<br>DEPARTMENTS<br>AND AGENCIES OF THE<br>DEPARTMENT OF DEFENSE |    | APPROVED BY<br>Robert P. Evans    |   |   |   | MICROCIRCUIT, DIGITAL, TTL-TO-ECL<br>TRANSLATOR, MONOLITHIC SILICON |                           |   |                   |   |   |    |    |    |
| AMSC N/A   |    | DRAWING APPROVAL DATE<br>87-11-24 |   |   |   | MICROCIRCUIT, DIGITAL, TTL-TO-ECL<br>TRANSLATOR, MONOLITHIC SILICON |                           |   |                   |   |   |    |    |    |
| AMSC N/A   |    | REVISION LEVEL<br>E               |   |   |   | SIZE<br>A   | CAGE CODE<br><b>67268</b> |   | <b>5962-87560</b> |   |   |    |    |    |
| AMSC N/A   |    |                                   |   |   |   | SHEET   | 1 OF 15                   |   |                   |   |   |    |    |    |

## 1. SCOPE

1.1 Scope. This drawing describes device requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A.

1.2 Part or Identifying Number (PIN). The complete PIN is as shown in the following example:

|                   |                            |                             |                            |
|-------------------|----------------------------|-----------------------------|----------------------------|
| <u>5962-87560</u> | <u>01</u>                  | <u>E</u>                    | <u>X</u>                   |
| *                 | *                          | *                           | *                          |
| *                 | *                          | *                           | *                          |
| *                 | *                          | *                           | *                          |
| *                 | *                          | *                           | *                          |
| Drawing number    | Device type<br>(see 1.2.1) | Case outline<br>(see 1.2.2) | Lead finish<br>(see 1.2.3) |

1.2.1 Device type(s). The device type(s) identify the circuit function as follows:

| <u>Device type</u> | <u>Generic number</u> | <u>Circuit function</u>    |
|--------------------|-----------------------|----------------------------|
| 01                 | 10H524                | Quad TTL-to-ECL translator |

1.2.2 Case outline(s). The case outline(s) are as designated in MIL-STD-1835 and as follows:

| <u>Outline letter</u> | <u>Descriptive designator</u> | <u>Terminals</u> | <u>Package style</u> |
|-----------------------|-------------------------------|------------------|----------------------|
| E                     | GDIP1-T16 or CDIP2-T16        | 16               | Dual -in-line        |
| F                     | GDFP2-F16 or CDFP3-F16        | 16               | Flat package         |
| X                     | CDFP4-F16                     | 16               | Flat-package         |
| 2                     | CQCC1-N20                     | 20               | Square chip carrier  |

1.2.3 Lead finish. The lead finish is as specified in MIL-PRF-38535, appendix A.

## 1.3 Absolute maximum ratings.

|  |                       |
|--|-----------------------|
| Positive supply voltage range (V <sub>CC</sub> ) .....                   | 0.0 V dc to 7.0 V dc  |
| Negative supply voltage range (V <sub>EE</sub> ) .....                   | -8.0 V dc to 0.0 V dc |
| Total supply voltage range (V <sub>CC</sub> +   V <sub>EE</sub>  ) ..... | 12 V dc               |
| Input voltage range.....   | -5.2 V dc to 0.0 V dc |
| Storage temperature range.....   | -65EC to +165EC       |
| Lead temperature (soldering, 10 seconds).....                            | +300EC                |
| Junction temperature (T <sub>J</sub> ) .....                             | +165EC                |
| Maximum power dissipation (P <sub>D</sub> ) .....                        | 530 mW                |
| Thermal resistance, junction-to-case (θ <sub>JC</sub> ).....             | See MIL-STD-1835      |

## 1.4 Recommended operating conditions.

|  |  |
|--|--|
| Positive supply voltage range (V <sub>CC</sub> ) .....   | 4.5 V dc minimum to 5.5 V dc maximum     |
| Negative supply voltage range (V <sub>EE</sub> ).....    | -5.46 V dc minimum to -4.94 V dc maximum |
| Case operating temperature range (T <sub>C</sub> ).....  | -55EC to +125EC                          |
| Minimum high level input voltage (V <sub>IH</sub> ):     |  |
| T <sub>A</sub> = +25EC.....                              | -0.780 V dc                              |
| T <sub>A</sub> = +125EC.....                             | -0.650 V dc                              |
| T <sub>A</sub> = -55EC.....                              | -0.840 V dc                              |
| Maximum low level input voltage (V <sub>IL</sub> ) ..... | -1.950 V dc                              |

|   |                     |                   |
|---|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | <b>SIZE</b>         | <b>5962-87560</b> |
|   | REVISION LEVEL<br>E |                   |

## 2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

### SPECIFICATION

#### DEPARTMENT OF DEFENSE

MIL-PRF-38535 - Integrated Circuits, Manufacturing, General Specification for.

### STANDARDS

#### DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Method Standard Microcircuits.  
MIL-STD-973 - Configuration Management.  
MIL-STD-1835 - Interface Standard For Microcircuit Case Outlines.

### HANDBOOKS

#### DEPARTMENT OF DEFENSE

MIL-HDBK-103 - List of Standard Microcircuit Drawings (SMD's).  
MIL-HDBK-780 - Standard Microcircuit Drawings.

(Unless otherwise indicated, copies of the specification, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein. Product built to this drawing that is produced by a Qualified Manufacturer Listing (QML) certified and qualified manufacturer or a manufacturer who has been granted transitional certification to MIL-PRF-38535 may be processed as QML product in accordance with the manufacturers approved program plan and qualifying activity approval in accordance with MIL-PRF-38535. This QML flow as documented in the Quality Management (QM) plan may make modifications to the requirements herein. These modifications shall not affect form, fit, or function of the device. These modifications shall not affect the PIN as described herein. A "Q" or "QML" certification mark in accordance with MIL-PRF-38535 is required to identify when the QML flow option is used.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535, appendix A and herein.

3.2.1 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.3 Truth table. The truth table shall be as specified on figure 2.

|   |                     |                   |
|---|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | <b>SIZE</b>         | <b>5962-87560</b> |
|   | REVISION LEVEL<br>E | <b>3</b>          |

3.2.4 Logic diagram. The logic diagram shall be as specified on figure 3.

3.2.5 Test circuit and switching waveforms. The test circuit and switching waveforms shall be as specified on figure 4.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall apply over the full case operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-PRF-38535, appendix A. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-HDBK-103 (see 6.6 herein). For packages where marking of the entire SMD PIN number is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device.

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-HDBK-103 (see 6.6 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-PRF-38535, appendix A and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DSCC-VA shall be required in accordance with MIL-PRF-38535, appendix A.

3.9 Verification and review. DSCC, DSCC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

(2)  $T_A = +125^{\circ}\text{C}$ , minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

|   |                     |                   |
|---|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | <b>SIZE</b>         | <b>5962-87560</b> |
|   | REVISION LEVEL<br>E |                   |

TABLE I. Electrical performance characteristics.

| Test                                   | Symbol    | Conditions<br>-55°C # Tc #+125°C<br>unless otherwise specified  | Group A<br>subgroups            | Limits            |             | Unit   |
|--|-----------|---|---------------------------------|-------------------|-------------|--|
|  |           |   |                                 | Min               | Max         |  |
| Cases E, F, 2 and X                    |           |   |                                 |                   |             |  |
|  |           | Quiescent tests 1/  |                                 |                   |             |  |
| High level output voltage              | $V_{OH}$  | Outputs terminated<br>through 100Ω<br>to -2 V   | $V_R$                           | $V_F$             | 1<br>2<br>3 | -1.010<br>-0.860<br>-1.060<br>-0.840                     |
| Low level output voltage               | $V_{OL}$  | $V_{CC} = +5.0 \text{ V}$<br>$V_{EE} = -5.2 \text{ V}$<br>$GND = 0.0 \text{ V}$ 2/                            | 2.4<br>2.4<br>2.4               | 0.4<br>0.4<br>0.4 | 1<br>2<br>3 | -1.950<br>-1.950<br>-1.950<br>-1.580<br>-1.565<br>-1.610 |
| High level threshold<br>output voltage | $V_{OHA}$ |   | $V_{IHT}$                       | $V_{ILT}$         | 1<br>2<br>3 | -1.010<br>-0.860<br>-1.060<br>-0.780<br>-0.650<br>-0.840 |
| Low level threshold<br>output voltage  | $V_{OLA}$ |   | 2.0<br>2.0<br>2.0               | 0.8<br>0.8<br>0.8 | 1<br>2<br>3 | -1.950<br>-1.950<br>-1.950<br>-1.580<br>-1.565<br>-1.610 |
| Input clamping voltage                 | $V_D$     |   | $A_{IN}, B_{IN}, C_{IN} D_{IN}$ |                   | 1, 2, 3     | -1.5   |
|  |           | GND = 0.0 V<br>$I_D = -10 \text{ mA}$<br>$V_{CC} = +5.0 \text{ V}$<br>$V_{EE} = -5.46 \text{ V}$              |                                 |                   |             |  |
|  |           | GND = 0.0 V<br>$I_D = -20 \text{ mA}$<br>$V_{CC} = +5.0 \text{ V}$<br>$V_{EE} = -5.46 \text{ V}$              | Strobe                          |                   | 1, 2, 3     | -1.5   |
| Input breakdown current                | $I_{IN}$  | $B_{VIN} = 5.5 \text{ V}$<br>$V_{EE} = -5.46 \text{ V}$<br>$V_{CC} = +5.0 \text{ V}$<br>$GND = 0.0 \text{ V}$ |                                 |                   | 1, 2, 3     | 1.0  |
| Forward bias input<br>current          | $I_{INF}$ | $V_{CC} = +5.0 \text{ V}$<br>$V_F = 0.4 \text{ V}$<br>$V_{EE} = -4.94 \text{ V}$<br>$GND = 0.0 \text{ V}$     | $A_{IN}, B_{IN}, C_{IN} D_{IN}$ |                   | 1, 2, 3     | -3.2   |

See footnotes at end of table.

|   |                     |            |
|---|---------------------|------------|
| STANDARD<br>MICROCIRCUIT DRAWING<br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | SIZE<br><b>A</b>    | 5962-87560 |
|   | REVISION LEVEL<br>E |            |

TABLE I. Electrical performance characteristics

| Test                       | Symbol             | Conditions<br>-55°C # T <sub>C</sub> #+125°C<br>unless otherwise specified                     | Group A<br>subgroups  | Limits  |     | Unit     |  |
|----------------------------|--------------------|--|---|---------|-----|----------|--|
|                            |                    |  |   | Min     | Max |          |  |
| Cases E, F, 2 and X        |                    | Quiescent tests - continued1/  |   |         |     |          |  |
| Forward bias input current | I <sub>INF</sub>   | V <sub>CC</sub> = +5.0 V<br>V <sub>R</sub> = 2.4 V<br>V <sub>EE</sub> = -4.94 V<br>GND = 0.0 V | Strobe  | 1, 2, 3 |     | -12.8 mA |  |
| Reverse bias input current | I <sub>R</sub>     | V <sub>CC</sub> = +5.0 V<br>V <sub>R</sub> = 2.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V | A <sub>IN</sub> , B <sub>IN</sub> , C <sub>IN</sub> , D <sub>IN</sub> | 1, 2, 3 |     | 50 µA    |  |
|                            |                    | V <sub>CC</sub> = +5.0 V<br>V <sub>F</sub> = 0.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V | Strobe  | 1, 2, 3 |     | 200 µA   |  |
| Supply current negative    | I <sub>EE</sub> 4/ | V <sub>EE</sub> = -5.46 V  |   | 2,3     | -72 | mA       |  |
|                            |                    | V <sub>CC</sub> = +5.0 V<br>GND = 0.0 V  |   | 1       | -66 | mA       |  |
| Supply current high        | I <sub>CCH</sub>   | All inputs = 2.4 V<br>V <sub>CC</sub> = +5.0 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V     |   | 1, 3    |     | 16 mA    |  |
|                            |                    |  |   | 2       |     | 18 mA    |  |
| Supply current low         | I <sub>CCL</sub>   | Strobe = 0.4 V<br>V <sub>CC</sub> = +5.0 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V         |   | 1, 3    |     | 25 mA    |  |
|                            |                    |  |   | 2       |     | 25 mA    |  |
| Functional tests           |                    | See 4.3.1c   |   | 7       |     |          |  |

Cases E, F and X DC rapid tests 3/

| High level output voltage | V <sub>OH</sub> | Outputs terminated through<br>100Ω to -2 V | V <sub>R</sub> | V <sub>F</sub> | 1 | -1.028 | -0.800 | V |
|---------------------------|-----------------|--|----------------|----------------|---|--------|--------|---|
|                           |                 |  | 2.4            | 0.4            |   |        |        |   |
|                           |                 |  | 2.4            | 0.4            |   |        |        |   |
| Low level output voltage  | V <sub>OL</sub> | V <sub>CC</sub> = +5.0 V                   | 2.4            | 0.4            | 1 | -1.950 | -1.586 | V |
|                           |                 | V <sub>EE</sub> = -5.2 V                   | 2.4            | 0.4            | 2 | -1.950 | -1.571 |   |
|                           |                 | GND = 0.0 V 2/                             | 2.4            | 0.4            | 3 | -1.950 | -1.616 |   |

See footnotes at end of table.

|   |                   |                     |                   |
|---|-------------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | <b>SIZE<br/>A</b> |                     | <b>5962-87560</b> |
|   |                   | REVISION LEVEL<br>E | SHEET<br>6        |

TABLE I. Electrical performance characteristics.

| Test                                   | Symbol           | Conditions<br>-55°C # Tc #+125°C<br>unless otherwise specified                                   | Group A<br>subgroups  | Limits           |     | Unit   |
|--|------------------|--|---|------------------|-----|--------|
|  |                  |  |   | Min              | Max |        |
| Cases E, F and X                       |                  |  |   |                  |     |        |
| High level threshold<br>output voltage | V <sub>OHA</sub> | Outputs terminated<br>through<br>100Ω to -2 V  | V <sub>IHT</sub>  | V <sub>ILT</sub> | 1   | V      |
|  |                  |  | 2.0   | 0.8              | 2   |        |
|  |                  |  | 2.0   | 0.8              | 3   |        |
| Low level threshold<br>output voltage  | V <sub>OLA</sub> | V <sub>CC</sub> = +5.0 V<br>V <sub>EE</sub> = -5.2 V<br>GND = 0.0 V 2/                           | 2.0   | 0.8              | 1   | V      |
|  |                  |  | 2.0   | 0.8              | 2   |        |
|  |                  |  | 2.0   | 0.8              | 3   |        |
| Input clamping voltage                 | V <sub>D</sub>   | V <sub>CC</sub> = +5.0 V<br>I <sub>D</sub> = -10 mA<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V  | A <sub>IN</sub> , B <sub>IN</sub> , C <sub>IN</sub> D <sub>IN</sub> | 1, 2, 3          |     | V      |
|  |                  | V <sub>CC</sub> = +5.0 V<br>I <sub>D</sub> = -20 mA<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V  | Strobe  | 1, 2, 3          |     |        |
| Input breakdown current                | I <sub>IN</sub>  | B <sub>VIN</sub> = 5.5 V<br>V <sub>CC</sub> = +5.0 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V |   | 1, 2, 3          |     | 1.0 mA |
| Forward bias input<br>current          | I <sub>INF</sub> | V <sub>CC</sub> = +5.0 V<br>V <sub>F</sub> = 0.4 V<br>V <sub>EE</sub> = -4.94 V<br>GND = 0.0 V   | A <sub>IN</sub> , B <sub>IN</sub> , C <sub>IN</sub> D <sub>IN</sub> | 1, 2, 3          |     | mA     |
|  |                  | V <sub>CC</sub> = +5.0 V<br>V <sub>R</sub> = 2.4 V<br>V <sub>EE</sub> = -4.94 V<br>GND = 0.0 V   | Strobe  | 1, 2, 3          |     |        |
| Reverse bias input<br>current          | I <sub>R</sub>   | V <sub>CC</sub> = +5.0 V<br>V <sub>R</sub> = 2.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V   | A <sub>IN</sub> , B <sub>IN</sub> , C <sub>IN</sub> D <sub>IN</sub> | 1, 2, 3          |     | μA     |
|  |                  | V <sub>CC</sub> = +5.0 V<br>V <sub>F</sub> = 0.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V   | Strobe  | 1, 2, 3          |     |        |

See footnotes at end of table.

|   |                         |                   |
|---|-------------------------|-------------------|
| <b>STANDARD</b><br><b>MICROCIRCUIT DRAWING</b><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | <b>SIZE</b><br><b>A</b> | <b>5962-87560</b> |
|   | REVISION LEVEL<br>E     |                   |

TABLE I. Electrical performance characteristics - Continued.

| Test                    | Symbol             | Conditions<br>-55°C # T <sub>C</sub> #+125°C<br>unless otherwise specified                 | Group A<br>subgroups | Limits |     | Unit |
|-------------------------|--------------------|--|----------------------|--------|-----|------|
|                         |                    |  |                      | Min    | Max |      |
| Cases E, F and X        |                    |  |                      |        |     |      |
| Supply current negative | I <sub>EE</sub> 4/ | V <sub>EE</sub> = -5.46 V<br>V <sub>CC</sub> = +5.0 V<br>GND = 0.0 V                       | 2, 3                 | -71    |     | mA   |
|                         |                    |  | 1                    | -65    |     | mA   |
| Supply current high     | I <sub>CCH</sub>   | V <sub>CC</sub> = +5.0 V<br>All inputs = 2.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V | 1, 3                 |        | 16  | mA   |
|                         |                    |  | 2                    |        | 18  | mA   |
| Supply current low      | I <sub>CCH</sub>   | V <sub>CC</sub> = +5.0 V<br>Strobe = 0.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V     | 1, 3                 |        | 25  | mA   |
|                         |                    |  | 2                    |        | 25  | mA   |
| Functional tests        |                    | See 4.3.1c   | 7                    |        |     |      |

Case 2

|  |                  |  | V <sub>R</sub>   | V <sub>F</sub> |   |        |        |   |
|--|------------------|--|------------------|----------------|---|--------|--------|---|
| High level output voltage              | V <sub>OH</sub>  | Outputs terminated<br>through 100Ω<br>to -2 V.                         | 2.4              | 0.4            | 1 | -1.034 | -0.806 | V |
|  |                  |  | 2.4              | 0.4            | 2 | -0.886 | -0.678 |   |
|  |                  |  | 2.4              | 0.4            | 3 | -1.086 | -0.868 |   |
| Low level output voltage               | V <sub>OL</sub>  | V <sub>CC</sub> = +5.0 V<br>V <sub>EE</sub> = -5.2 V<br>GND = 0.0 V 2/ | 2.4              | 0.4            | 1 | -1.950 | -1.588 | V |
|  |                  |  | 2.4              | 0.4            | 2 | -1.950 | -1.574 |   |
|  |                  |  | 2.4              | 0.4            | 3 | -1.950 | -1.619 |   |
| High level threshold<br>output voltage | V <sub>OHA</sub> | V <sub>IHT</sub>   | V <sub>ILT</sub> |                |   |        |        |   |
|  |                  |  | 2.0              | 0.8            | 1 | -1.034 | -0.806 | V |
|  |                  |  | 2.0              | 0.8            | 2 | -0.886 | -0.678 |   |
| Low level threshold<br>output voltage  | V <sub>OLA</sub> |  | 2.0              | 0.8            | 3 | -1.086 | -0.868 |   |
|  |                  |  | 2.0              | 0.8            | 1 | -1.950 | -1.588 | V |
|  |                  |  | 2.0              | 0.8            | 2 | -1.950 | -1.574 |   |
|  |                  |  | 2.0              | 0.8            | 3 | -1.950 | -1.619 |   |

See footnotes at end of table.

|   |           |                     |            |
|---|-----------|---------------------|------------|
| STANDARD<br>MICROCIRCUIT DRAWING<br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | SIZE<br>A | REVISION LEVEL<br>E | 5962-87560 |
|   |           |                     | SHEET<br>8 |

TABLE I. Electrical performance characteristics - Continued.

| Test                       | Symbol             | Conditions<br>-55°C # Tc #+125°C<br>unless otherwise specified                                   | Group A<br>subgroups  | Limits  |     | Unit  |
|----------------------------|--------------------|--|---|---------|-----|-------|
|                            |                    |  |   | Min     | Max |       |
| Case 2                     |                    |  |   |         |     |       |
| Input clamping voltage     | V <sub>D</sub>     | V <sub>CC</sub> = +5.0 V<br>I <sub>D</sub> = -10 mA<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V  | A <sub>IN</sub> , B <sub>IN</sub> , C <sub>IN</sub> D <sub>IN</sub> | 1, 2, 3 |     | -1.5  |
|                            |                    | V <sub>CC</sub> = +5.0 V<br>I <sub>D</sub> = -20 mA<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V  | Strobe  | 1, 2, 3 |     | -1.5  |
| Input breakdown current    | I <sub>IN</sub>    | B <sub>VIN</sub> = 5.5 V<br>V <sub>EE</sub> = -5.46 V<br>V <sub>CC</sub> = +5.0 V<br>GND = 0.0 V |   | 1, 2, 3 |     | 1.0   |
| Forward bias input current | I <sub>INF</sub>   | V <sub>CC</sub> = +5.0 V<br>V <sub>F</sub> = 0.4 V<br>V <sub>EE</sub> = -4.94 V<br>GND = 0.0 V   | A <sub>IN</sub> , B <sub>IN</sub> , C <sub>IN</sub> D <sub>IN</sub> | 1, 2, 3 |     | -3.2  |
|                            |                    | V <sub>CC</sub> = +5.0 V<br>V <sub>R</sub> = 2.4 V<br>V <sub>EE</sub> = -4.94 V<br>GND = 0.0 V   | Strobe  | 1, 2, 3 |     | -12.8 |
| Reverse bias input current | I <sub>R</sub>     | V <sub>CC</sub> = +5.0 V<br>V <sub>R</sub> = 2.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V   | A <sub>IN</sub> , B <sub>IN</sub> , C <sub>IN</sub> D <sub>IN</sub> | 1, 2, 3 |     | 50    |
|                            |                    | V <sub>CC</sub> = +5.0 V<br>V <sub>R</sub> = 0.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V   | Strobe  | 1, 2, 3 |     | 200   |
| Supply current negative    | I <sub>EE</sub> 4/ | V <sub>EE</sub> = -5.46 V<br>V <sub>CC</sub> = +5.0 V<br>GND = 0.0 V                             |   | 2, 3    | -71 |       |
|                            |                    |  |   | 1       | -65 |       |

See footnotes at end of table.

|   |                     |            |
|---|---------------------|------------|
| STANDARD<br>MICROCIRCUIT DRAWING<br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | SIZE<br><b>A</b>    | 5962-87560 |
|   | REVISION LEVEL<br>E |            |

TABLE I. Electrical performance characteristics - Continued.

| Test                | Symbol           | Conditions<br>-55°C # Tc #+125°C<br>unless otherwise specified                             | Group A<br>subgroups | Limits |     | Unit |
|---------------------|------------------|--|----------------------|--------|-----|------|
|                     |                  |  |                      | Min    | Max |      |
| Case 2              |                  |  |                      |        |     |      |
| Supply current high | I <sub>CCH</sub> | V <sub>CC</sub> = +5.0 V<br>All inputs = 2.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V | 1, 3                 |        | 16  | mA   |
|                     |                  |  | 2                    |        | 18  | mA   |
| Supply current low  | I <sub>CCL</sub> | V <sub>CC</sub> = +5.0 V<br>Strobe = 0.4 V<br>V <sub>EE</sub> = -5.46 V<br>GND = 0.0 V     | 1, 3                 |        | 25  | mA   |
|                     |                  |  | 2                    |        | 25  | mA   |
| Functional tests    |                  | See 4.3.1c   | 7                    |        |     |      |

## Cases E, F, X and 2

## AC tests

|   |                                      |  |               |                    |                   |                |
|---|--------------------------------------|--|---------------|--------------------|-------------------|----------------|
| Transition time   | t <sub>TLH</sub><br>t <sub>THL</sub> | V <sub>EE</sub> = -2.94 V<br>V <sub>CC</sub> = +7.0 V<br>C <sub>L</sub> ≤ 5 pF | 9<br>10<br>11 | 0.45<br>0.5<br>0.4 | 2.0<br>2.5<br>1.8 | ns<br>ns<br>ns |
| Propagation delay time,<br>A, B, C, or D input to<br>A, B, C, or D output | t <sub>PHH1</sub>                    | Load all outputs<br>through 100Ω to ground.<br>GND = +2.0 V<br>See figure 4    | 9             | 0.55               | 2.4               | ns             |
|   | t <sub>PLL1</sub>                    |  | 10            | 0.50               | 3.5               | ns             |
|   | t <sub>PHL1</sub>                    |  | 11            | 0.50               | 2.1               | ns             |
|   | t <sub>PLH1</sub>                    |  |               |                    |                   |                |
| Propagation delay time,<br>strobe to output                               | t <sub>PHH2</sub>                    |  | 9             | 0.55               | 2.5               | ns             |
|   | t <sub>PLL2</sub>                    |  | 10            | 0.85               | 3.6               | ns             |
|   | t <sub>PHL2</sub>                    |  | 11            | 0.55               | 2.0               | ns             |
|   | t <sub>PLH2</sub>                    |  |               |                    |                   |                |
| Functional tests  |                                      | See 4.3.1c   | 7             |                    |                   |                |

1/ The quiescent limits are determined after a device has reached thermal equilibrium. This is defined as the reading taken with the device in a socket with  $\geq 500$  LFPM of  $+25^\circ C$ ,  $+125^\circ C$  or  $-55^\circ C$  (as applicable) air blowing on the unit in a transverse direction with power applied for at least 4 minutes before the reading is taken. This method was used for theoretical limit establishment only. All devices shall be tested to the delta V (rapid test) conditions specified herein. The rapid test method is an equivalent method of testing quiescent conditions.

2/ The high and low level output current varies with temperature and shall be calculated using the following formulas:  
 $I_{OH} = (-2 V - V_{OH})/100\Omega$  and  $I_{OL} = (-2 V - V_{OL})/100\Omega$ .

3/ The dc rapid test forcing functions and limits are used for all dc testing. These limits are determined for each device type based on the power dissipation and package type. The rapid test (delta V) limits and forcing functions are skewed allowing rapid testing to be performed at standard temperatures without the addition of delta T's.

4/ I<sub>EE</sub> limits, although specified in the Min column, shall not be exceeded in magnitude, as a maximum value.

|   |                            |            |
|---|----------------------------|------------|
| STANDARD<br>MICROCIRCUIT DRAWING<br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | SIZE<br><b>A</b>           | 5962-87560 |
|   | REVISION LEVEL<br><b>E</b> |            |

| Case outlines   | E                 | F, X              | 2                 |
|-----------------|-------------------|-------------------|-------------------|
| Terminal number | Terminal symbol   |                   |                   |
| 1               | B <sub>OUT</sub>  | ̄D <sub>OUT</sub> | NC                |
| 2               | A <sub>OUT</sub>  | D <sub>OUT</sub>  | B <sub>OUT</sub>  |
| 3               | ̄B <sub>OUT</sub> | C <sub>OUT</sub>  | A <sub>OUT</sub>  |
| 4               | ̄A <sub>OUT</sub> | GND               | ̄B <sub>OUT</sub> |
| 5               | A <sub>IN</sub>   | B <sub>OUT</sub>  | ̄A <sub>OUT</sub> |
| 6               | STROBE            | A <sub>OUT</sub>  | NC                |
| 7               | B <sub>IN</sub>   | ̄B <sub>OUT</sub> | A <sub>IN</sub>   |
| 8               | V <sub>EE</sub>   | ̄A <sub>OUT</sub> | STROBE            |
| 9               | V <sub>CC</sub>   | A <sub>IN</sub>   | B <sub>IN</sub>   |
| 10              | C <sub>IN</sub>   | STROBE            | V <sub>EE</sub>   |
| 11              | D <sub>IN</sub>   | B <sub>IN</sub>   | NC                |
| 12              | ̄C <sub>OUT</sub> | V <sub>EE</sub>   | V <sub>CC</sub>   |
| 13              | ̄D <sub>OUT</sub> | V <sub>CC</sub>   | C <sub>IN</sub>   |
| 14              | D <sub>OUT</sub>  | C <sub>IN</sub>   | D <sub>IN</sub>   |
| 15              | C <sub>OUT</sub>  | D <sub>IN</sub>   | ̄C <sub>OUT</sub> |
| 16              | GND               | ̄C <sub>OUT</sub> | NC                |
| 17              | ---               | ---               | ̄D <sub>OUT</sub> |
| 18              | ---               | ---               | D <sub>OUT</sub>  |
| 19              | ---               | ---               | C <sub>OUT</sub>  |
| 20              | ---               | ---               | GND               |

NC = No connection

FIGURE 1. Terminal connections.

|   |                |                   |
|---|----------------|-------------------|
| <b>STANDARD</b><br><b>MICROCIRCUIT DRAWING</b><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | <b>SIZE</b>    | <b>5962-87560</b> |
|   | <b>A</b>       |                   |
|   | REVISION LEVEL |                   |
|   | E              | <b>SHEET</b>      |
|   |                | <b>11</b>         |

| Strobe | Input | OUT | $\overline{\text{OUT}}$ |
|--------|-------|-----|-------------------------|
| L      | X     | L   | H                       |
| H      | L     | L   | H                       |
| H      | H     | H   | L                       |

H = High level

L = Low level

X = Irrelevant

FIGURE 2. Truth table.

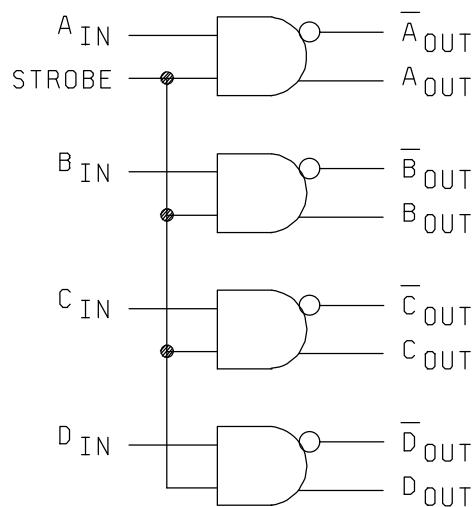


FIGURE 3. Logic diagram.

**STANDARD  
MICROCIRCUIT DRAWING**  
DEFENSE SUPPLY CENTER COLUMBUS  
COLUMBUS, OHIO 43216-5000

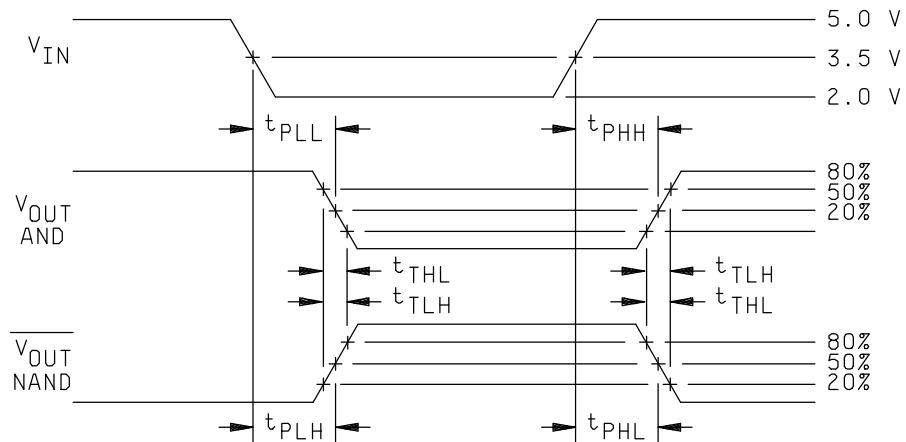
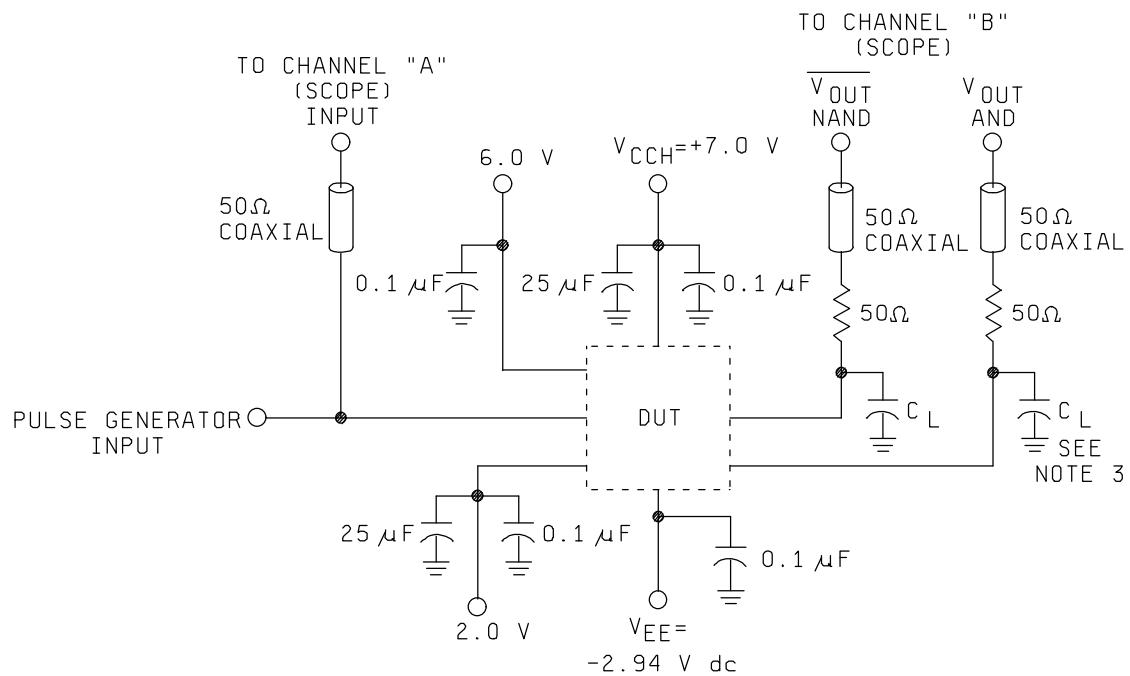
**SIZE  
A**

**5962-87560**

REVISION LEVEL  
E

SHEET

**12**



NOTES:

1.  $50 \Omega$  to ground located in each scope channel input.
2. All input and output cables to the scope are equal lengths of  $50 \Omega$  coaxial cable.
3.  $C_L$  (test jig)  $\leq 5 \text{ pF}$ .
4. Unused outputs connected to  $100 \Omega$  resistor to ground.
5. Pulse generator characteristics:

PRR = 1 MHz,  $t_r$  and  $t_f$  =  $2.0 \text{ ns} \pm 0.2 \text{ ns}$  (20% to 80%), duty cycle = 50%.

FIGURE 4. Test circuit and switching waveforms.

TABLE II. Electrical test requirements.

| MIL-STD-883 test requirements                                      | Subgroups<br>(in accordance with<br>MIL-STD-883, method 5005,<br>table I) |
|--|---|
| Interim electrical parameters<br>(method 5004)                     | 1   |
| Final electrical test parameters<br>(method 5004)                  | 1*, 2, 3, 7*,9  |
| Group A test requirements<br>(method 5005)                         | 1, 2, 3, 7,<br>9, 10, 11  |
| Groups C and D end-point<br>electrical parameters<br>(method 5005) | 1, 2, 3   |

\* PDA applies to subgroup 1 and 7.

4.3.1 Group A inspection.

- a. Tests shall be as specified in table II herein.
- b. Subgroups 4, 5, 6, 8A and 8B in table I, method 5005 of MIL-STD-883 shall be omitted.
- c. Subgroup 7 shall include verification of the truth table specified on figure 2 herein.

4.3.2 Groups C and D inspections.

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
  - (1) Test condition D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
  - (2)  $T_A = +125EC$ , minimum.
  - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535, appendix A.

|   |             |                     |                   |
|---|-------------|---------------------|-------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | <b>SIZE</b> |                     | <b>5962-87560</b> |
|   |             | REVISION LEVEL<br>E | <b>14</b>         |

## 6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-973 using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus when a system application requires configuration control and the applicable SMD. DSCC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0525.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43216-5000, or telephone (614) 692-0674.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DSCC-VA.

|   |             |                            |
|---|-------------|----------------------------|
| <b>STANDARD<br/>MICROCIRCUIT DRAWING</b><br>DEFENSE SUPPLY CENTER COLUMBUS<br>COLUMBUS, OHIO 43216-5000 | <b>SIZE</b> | <b>5962-87560</b>          |
|   |             | REVISION LEVEL<br><b>E</b> |
|   |             | <b>SHEET<br/>15</b>        |

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 98-10-20

Approved sources of supply for SMD 5962-87560 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535.

| Standard<br>microcircuit drawing<br>PIN <u>1/</u> | Vendor<br>CAGE<br>number | Vendor<br>similar<br>PIN <u>2/</u> |
|---|--------------------------|------------------------------------|
| 5962-8756001EA                                    | 0EU86                    | AS10H524C16/883C                   |
| 5962-8756001FA                                    | <u>3/</u>                | 10H524/BFAJC                       |
| 5962-87560012A                                    | 0EU86                    | AS10H524EC20/883C                  |
| 5962-8756001XA                                    | 0EU86                    | AS10H524F16/883C                   |

- 1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the vendor to determine its availability.
- 2/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.
- 3/ No longer available from the approved source of supply

Vendor CAGE  
number

0EU86

Vendor name  
and address

Austin Semiconductor Inc.  
8701 Cross Park Dr.  
Austin, TX 78754-4566

The information contained herein is disseminated for convenience only and the Government assumes no liability whatsoever for any inaccuracies in the information bulletin.