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5962-E1213

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited

1. SCOPE						
1.1 Scope. This drawing describes dewith 1.2.1 of MIL-STD-883, "Provisions for non-JAN devices".	rice requirement or the use of M	ts for class B IL-STD-883 in c	microcircu conjunction	its in accordance with compliant		
1.2 Part number. The complete part nu	mber shall be a	s shown in the	following	example:		
5962-89554 <u>01</u>	<del>-</del>	<u>c</u> 		X 		
	type .1)	Case outline (1.2.2)		ad finish per MIL-M-38510		
1.2.1 Device type. The device type sh	all identify th	e circuit func	tion as fo	llows:		
Device type Generic number		Circuit func	tion			
01 5 <del>4</del> F21	Dual	4-input positi	ve-AND gate	es		
1.2.2 <u>Case outlines</u> . The case outline as follows:	s shall be as d	esignated in a	ppendix C	of MIL-M-38510, and		
Outline letter	<u>c</u>	ase outline				
C D-1 (14-lead D F-2 (14-lead 2 C-2 (20-terw	, .785" x .310" , .390" x .260" inal, .358" x .	x .200"), dua x .085"), fla 358" x .100"),	l-in-line   t package square chi	backage ip carrier package		
1.3 Absolute maximum ratings.						
Supply voltage range	e high state	1.2 V dc 0.5 V dc - 40 mA 65°C to - +300°C - 175°C - See MIL-M	at -18 mA to +VCC	to +7.0 V dc maximum to +7.0 V dc		
1.4 Recommended operating conditions.						
Supply voltage range ( $V_{CC}$ ) Minimum high level input voltage ( $V_{IL}$ Maximum low level input voltage ( $V_{IL}$ Input clamp current ( $I_{IC}$ ) High level output current ( $I_{OH}$ ) Low level output current ( $I_{OL}$ ) Case operating temperature range ( $I_{OL}$ )	))	- 2.0 V dc - 0.8 V dc 18 mA 1.0 mA		+5.5 V dc maximum		
Power dissipation is defined as $v_{CC} \times r_{CC}$ , and must withstand the added Pp due to short-circuit output test; e.g., $r_{OS}$ .						
STANDARDIZED	SEZE A		-			
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### 2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

**SPECIFICATION** 

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

**MILITARY** 

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

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 shall take precedence.

#### 3. REQUIREMENTS

- 3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.
- 3.2 <u>Design</u>, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.
  - 3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.
  - 3.2.2 Truth table. The truth table shall be as specified on figure 2.
- 3.2.3 Test circuit and switching waveforms. The test circuit and switching waveforms shall be specified on figure 3.
  - 3.2.4 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.
- 3.3 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full case operating temperature range.
- 3.4 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in 6.4 herein.
- 3.5 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 6.4. The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall state that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

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TABLE I. Electrical performance characteristics. Conditions -55°C < T<sub>C</sub> < +125°C unless otherwise specified Test Symbol Group A Limits Unit subgroups Min Max  $V_{CC} = 4.5 \text{ V}$   $V_{IL} = 0.8 \text{ V}$ ,  $I_{OH} = -1.0 \text{ mA}$ High level output voltage 1, 2, 3 2.5  $V_{CC} = 4.5 \text{ V}$   $V_{IL} = 0.8 \text{ V}$ ,  $I_{OL} = 20 \text{ mA}$   $V_{IH} = 2.0 \text{ V}$ Low level output voltage VOL 1, 2, 3 0.5 VIC Input clamp voltage  $V_{CC} = 4.5 \text{ V}, I_{IC} = -18 \text{ mA}$ 1, 2, 3 -1.2  $V_{CC} = 5.5 \text{ V}$   $V_{IM} = 0.5 \text{ V}$ Low level input current 1, 2, 3 IIL mΑ -0.6 V<sub>CC</sub> = 5.5 V V<sub>IN</sub> = 2.7 V High level input current IIH1 1, 2, 3 20  $\mu A$ V<sub>CC</sub> = 5.5 V V<sub>IN</sub> = 7.0 V 0.1 I IH2 1, 2, 3 mA. V<sub>CC</sub> = 5.5 V V<sub>OUT</sub> = 0.0 V Short circuit output 105 1, 2, 3 |-60 -150 current 1/ V<sub>CC</sub> = 5.5 V V<sub>IN</sub> = 4.5 V Supply current 1, 2, 3 ICCH 4.31 V<sub>CC</sub> = 5.5 V V<sub>IN</sub> = 0.0 V 1, 2, 3 7.31 ICCL mΑ Functional tests See 4.3.1c 2/ 7, 8 See footnotes at end of table. **QUEE** STANDARDIZED A 5962-89554 DATY ORAWING BLACERONICA SUPPLY CENTER BAYTON, GNIO 45444 **MENNON LEVEL** 

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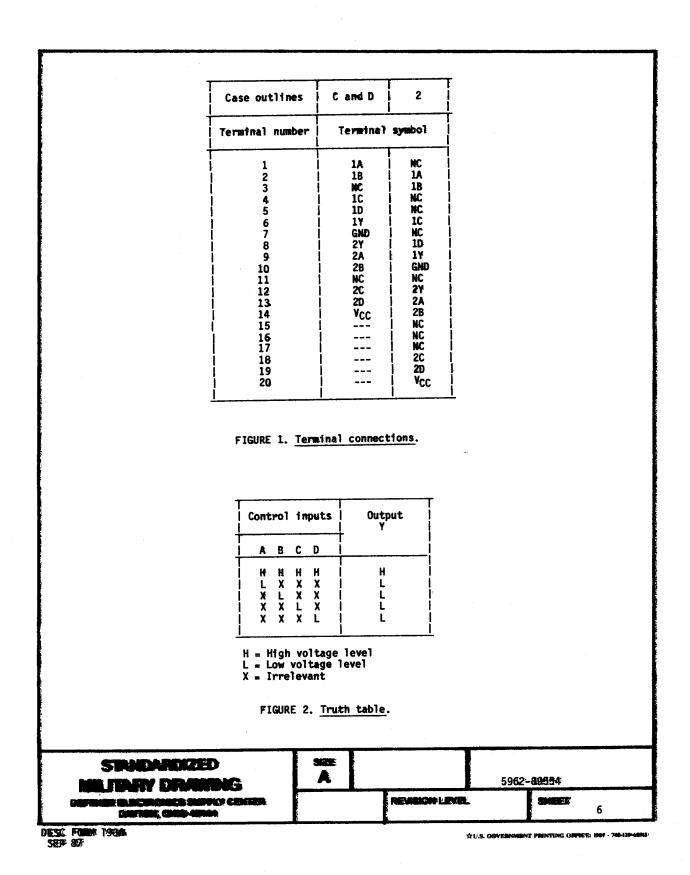
Test	Symbol Symbol	Conditions -55°C < T <sub>C</sub> < +125°C	Group A	Limi	ts	Unit
		unless otherwise specified	subgroups]	Min	Max	)   
Propagation delay time, from any input to Y	tPLH	V <sub>CC</sub> = 5.0 V   C <sub>L</sub> = 50 pF	9	1.0	4.7	ns
	tpHL	l Ri = 500ດ l See figure 3 l		1.5	5.1	
Propagation delay time, from any input to Y	tpLH	V <sub>CC</sub> = 4.5 V to 5.5 V   C <sub>L</sub> = 50 pF	10, 11	1.0	5.6	ns
	tpHL	Ri = 5000   See figure 3		1.5	5.9	

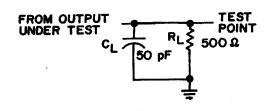
- 1/ Not more than one output will be shorted at one time and the duration of the test condition shall not exceed 1 second.
- 2/ Functional tests shall be conducted at input test conditions of GND  $\leq$  V<sub>IL</sub>  $\leq$  V<sub>OL</sub> and V<sub>OH</sub>  $\leq$  V<sub>IH</sub>  $\leq$  V<sub>CC</sub>.
- 3.6 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.
- 3.7 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).
- 3.8 Verification and review. DESC, DESC'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.

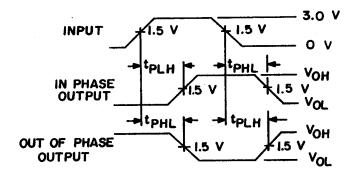
STANDARDIZED MILITARY DRAWING	SIZE A		5962-89554				
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# PROPAGATION DELAY TIMES

NOTES:

1.  $C_L$  includes probe and jig capacitance.

2. All input pulses have the following characteristics: PRR  $\leq$  10 MHz, duty cycle = 50%, t<sub>r</sub> = t<sub>f</sub> = 3 ns  $\pm$ 1 ns.

3. The outputs are measured one at a time with one input transition per measurement.

FIGURE 3. Test circuit and switching waveforms.

# STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 SIZE A 5962-89554 REVISION LEVEL SHEET 7

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## 4. QUALITY ASSURANCE PROVISIONS

- 4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-SID-883 (see 3.1 herein).
- 4.2 <u>Screening</u>. 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 or D using the circuit submitted with the certificate of compliance (see 3.5 herein).
    - (2)  $T_A = +125^{\circ}C$ , minimum.
  - b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burm-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-SID-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.
  - 4.3.1 Group A inspection.
    - a. Tests shall be as specified in table II herein.
    - b. Subgroups 4, 5, and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.
    - c. Subgroup 7 and 8 tests shall verify the truth table as specified on figure 2 herein.
  - 4.3.2 Groups C and D inspections.
    - a. End-point electrical parameters shall be as spucified in table II herein.
    - b. Steady-state life test conditions, method 1005 of MIL-STD-883.
      - Test condition A or D using the circuit submitted with the certificate of compliance (see 3.5 herein).
      - (2)  $T_A = +125$ °C, minimum.
      - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-863.

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DEFENSE BLECTRONICS SUPPLY CENTER DAIFTON, CHIC 48444		PRIVISION LEVEL		SHEET 8	

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\* U. S. GOVERNMENT PROVING GPPICE: 1005-003-0

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups   (per method   5005, table I)
Interim electrical parameters (method 5004)	
Final electrical test parameters (method 5004)	1*, 2, 3, 7, 8, 9, 10, 11
Group A test requirements (method 5005)	1, 2, 3, 7, 8, 9, 10, 11
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

<sup>\*</sup> PDA applies to subgroup 1.

### 5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

### 6. NOTES

- 6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.
- 6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.
- 6.3 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

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DEFENSE ELECTRONICS SUPPLY CENTER
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6.4 Approved source of supply. An approved source of supply is listed herein. Additional sources will be added as they become available. The vendor listed herein has agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to DESC-ECS.

Military drawing part number	Vendor   CAGE   number	Yendor similar part number 1/
5962-8955401CX	01295	SNJ54F21J
5962-8955401DX	01295	SNJ54F21W
5962- <b>895</b> 54012X	01295	SNJ54F21FK

Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

> Yendor CAGE number

01295

Vendor name and address

Texas Instruments, Incorporated P.O. Box 60448 Hidland, TX 79711-0448

STANDARDIZED

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