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DESC FORM 193

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1. SCOPE	, and the decondance with
1.1 Scope. This drawing describes device requirements 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-devices".	
1.2 Part number. The complete part number shall be as	shown in the following example:
Drawing number Device type Case out (1.2.1) (1.2.2)	T
1.2.1 Device type. The device type shall identify the	e circuit function as follows:
Device type Generic number	Circuit function
	Oual 4-5 input OR/NOR gate
1.2.2 <u>Case outlines</u> . The case outlines shall be as defollows:	esignated in appendix C of MIL-M-38510, and as
Outline letter Case o	<u>utline</u>
E D-2 (16-lead, 1/4" x 7/8 F F-5 (16-lead, 1/4" x 3/8 C-2 (20-terminal, .350"	"), dual-in-line package "), flat package x .350"), square chip carrier package
1.3 Absolute maximum ratings.	
Supply voltage range	-8.0 V dc to 0.0 V dc 0.0 V dc to -5.2 V dc -65°C to +165°C +300°C +165°C 211 mW (See MIL-M-38510, appendix C) 80°C/W 1/
1.4 Recommended operating conditions.	
Supply voltage (V_{CC}) Ambient operating temperature range (T_A) Minimum high level input voltage (V_{IH}): $T_A = +25^{\circ}C$	-5.46 V dc minimum to -4.94 V dc maximum -55°C to +125°C -0.780 V -0.650 V -0.840 V -1.950 V

1/ When a thermal resistance for this case is specified in MIL-M-38510, appendix C, that value shall supersede the value specified herein.

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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 tables. The truth tables shall be as specified on figure 2.
 - 3.2.3 Logic diagrams. The logic diagrams shall be as 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 recommended ambient 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 <u>Certificate of compliance</u>. 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.
- 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).

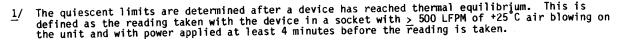
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Test	Symbol	Co 55°C	onditions	25°C		 Group A	Limi	ts	Unit
l	 	-55°C < TA < +125°C unless otherwise specified					Min i	Max	
Correct E and 2		Ouiesce	ent condi	tions	1/				
Cases E, F, and 2		, Quitoso		IH	VIL				
High level output voltage	011 	Outputs terminated through 100Ω to -2 V	1-0	.650	-1.950 -1.950 -1.950	2	-1.010 -0.860 -1.060	-0.650	٧
Low level output voltage	T	V _{CC} = 0.0 V VEE = -5.2 V	Ì-0	.650	-1.950 -1.950 -1.950	2	-1.950 -1.950 -1.950	-1.565	1
High level threshold output voltage	V _{OHA}	 	i -(960	-1.480 -1.465 -1.510	2	-1.010 -0.860 -1.060	-0.650	!
Low level threshold output voltage	V _{OLA}	-(j_(0.960	-1.480 -1.465 -1.510	1 2 3		-1.580 -1.565 -1.610	ļ
Power supply drain current	IEE	 			! 	1 2, 3	 -30 -33		mA
High level input current		Outputs terminated through				1 2 3		350 915 560	μ A
Low level input current	I IIL	1000 to -2 V VEE = -5.2 V VCC = 0.0 V All inputs			 	1, 3		0.5	 μ A
O		DC rapid	test con	dition	s 2/				
Cases E and F	Τ	Jo rapid		VIH	VIL	Ţ	Ţ		
High level output voltage	V _{OH}	 Outputs terminated through 100Ω to -2 W	l-	0.660	-1.950 -1.950 -1.950	1 2 3	 -1.018 -0.869 -1.069	-0.660	1
Low level output voltage	V _{OL}	V _{CC} = 0.0 V V _{EE} = -5.2 V 	' - -	0.660	 -1.950 -1.950 -1.950	1 1 2 1 3	-1.950 -1.950 -1.950	1-1.568	i I
High level threshold output voltage	V _{OHA}	- 	1-	0.969	-1.483 -1.468 -1.513	1 2 3	-1.018 -0.869 -1.069	1-0.660	1
Low level threshold output voltage	V _{OLA}		Ì-	0.969	-1.483 -1.468 -1.513	2	-1.950 -1.950 -1.950	-1.568	s)
Power supply drain current	IEE		 			2, 3	-29 -32	1	mA
see footnotes at end of tab	le								
MILITARY DRAV	WING	SIZE	672	268		VG NO. 5962-	87569		
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Test	Symbol	! Condit	ions		Group A	Limi	ts	Unit
	<u> </u>	-55°C < TA unless otherw	< +125°C	fied	subgroups 	Min	Max	
Cases E and F		DC rapid test	conditions	2/			335	μА
High level input current	IIH	Outputs terminated through			2 3		900 545	μΑ
Low level input current	I	1000 to -2 V VEE = -5.2 V VCC = 0.0 V All inputs	 	 	1, 3	 	0.5 0.3	 μΑ
Case 2		DC rapid test	condition	s 2/				
Case 2		1	VIH	VIL	I			
High level output voltage	 У _{ОН} 	 Outputs terminated through 100Ω to -2 V	-0.795 -0.666 -0.856	-1.950	- 1 2 3	 -1.024 -0.875 -1.075	-0.666	l
Low level output voltage	V _{OL}	V _{CC} = 0.0 V V _{EE} = -5.2 V	-0.795 -0.666 -0.856	1-1.950	1 2 3	 -1.950 -1.950 -1.950	1-1.570	İ
High level threshold output voltage	V _{OHA}	 	-1.124 -0.975 -1.175	1-1.470	1 2 3	-1.024 -0.875 -1.075	-0.666	l .
Low level threshold output voltage	V _{OLA}] -	-1.124 -0.975 -1.175	1-1.470	1 2 3	-1.950 -1.950 -1.950		1
Power supply drain current	IEE			 	2, 3	-29 -32) 	mA
High level input current	IIH	Outputs terminated through	 	 	1 2 1 3		335 900 545	Aμ l
Low level input current	IIL	100Ω to -2 V V _{EE} = -5.2 V V _{CC} = 0.0 V All inputs			1, 3		 0.5 0.3 	Ι μΑ
Cases E, F, and 2		AC test	condition	ıs				
Transition time	t _{TLH} t _{THL} t ⁺ , t-	V _{EE} = -2.94 V _{CC} = 2.0 V C _I < 5 pF			9 10 11		1.50 1.60 1.35	l ns
Propagation delay time	tpHH tpLL tpHL tpHL	Load all outpu 100Ω to ground All inputs 	ts through	1	9 10 11	0.40	1.40 1.90 1.30	ĺ
ee footnotes on next page.								
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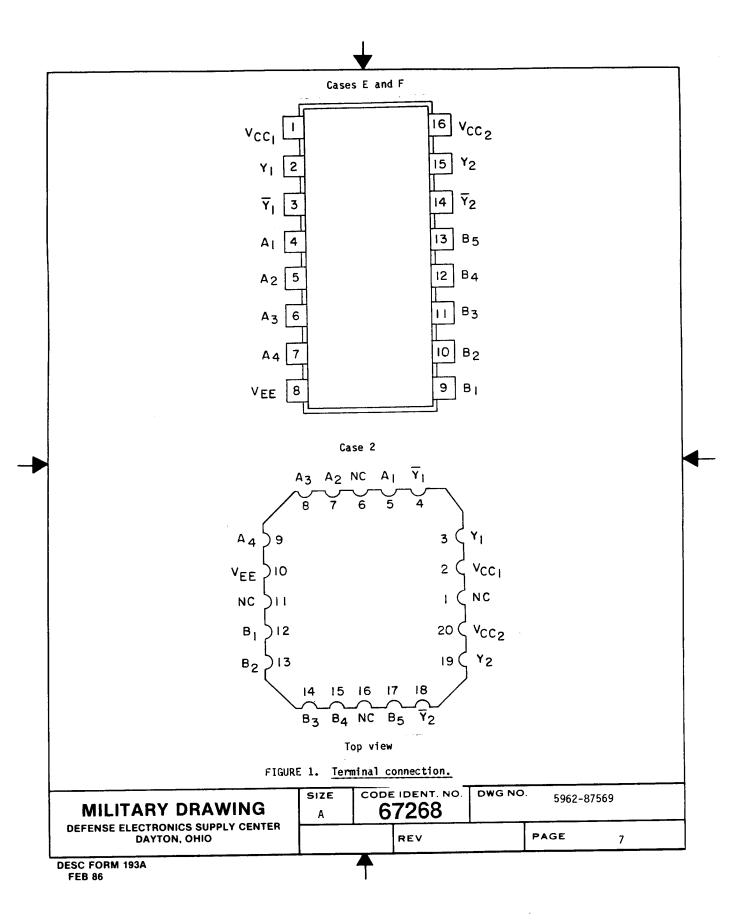
- 2/ The dc rapid test forcing functions and limits are used for all dc testing. These limits are determined for each device type based on the power dissipation and package type. The rapid test (delta V) limits and forcing functions are skewed allowing rapid testing to be performed at standard temperatures without the addition of delta T's.
- 3.8 <u>Verification and review</u>. 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.
 - 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-STD-883 (see 3.1 herein).
- 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 using the circuit submitted with the certificate of compliance (see 3.5 herein).
 - (2) $T_A = +125$ °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-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, 6, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.
 - c. Subgroup 4 ($C_{\rm IN}$ measurement) shall be measured only for the initial test and after process or design changes which may affect input capacitance.
 - d. Subgroup 7 tests shall verify the truth table.
 - 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 (method 1005 of MIL-STD-883) conditions:
 - (1) Test condition 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 appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.

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FIGURE 2. Truth tables.

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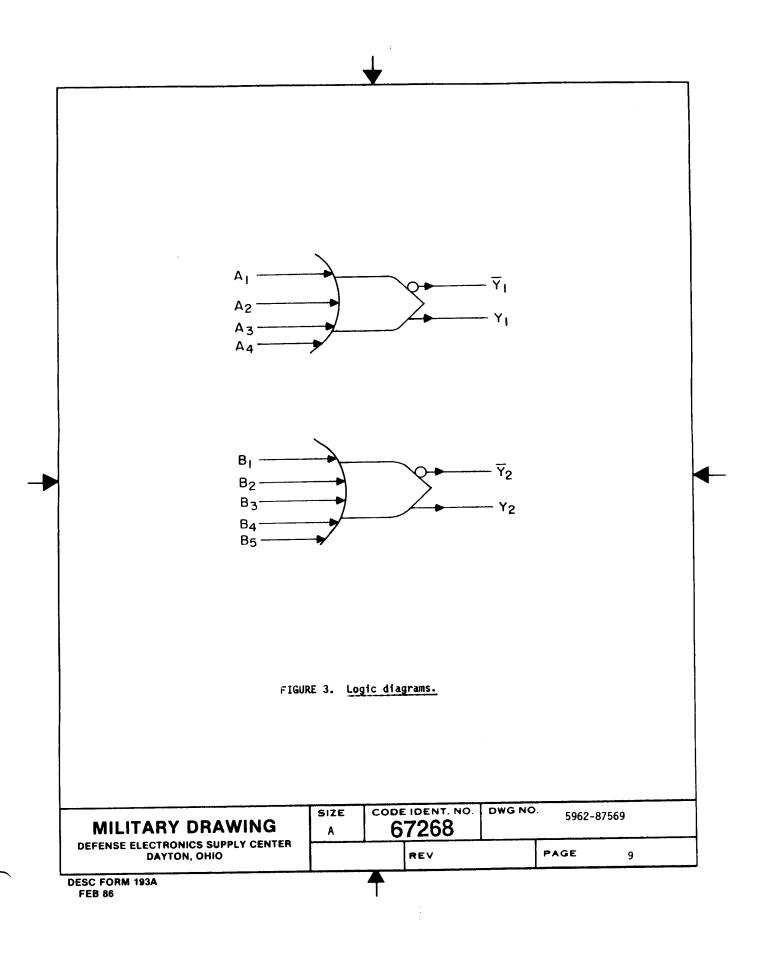


TABLE II. Electrical test requirements.

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

^{*} PDA applies to subgroups 1 and 7.

- 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 <u>Comments</u>. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

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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 3.5 herein) has been submitted to DESC-ECS.

Military drawing part number	Vendor CAGE number	Vendor similar part number 1/	[- -
5962-8756901EX	04713	10H609/BEAJC	hp16.3
5962-8756901FX	04713	10H609/BFAJC	[f1 p 1 6
5962-87569012X	04713	10H609M/B2CJC	[lutype c 20

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

Vendor CAGE number 04713 Vendor name and address

Motorola, Incorporated 7402 South Price Road Tempe, AZ 85283

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