| QUALIFICATION |
| REQUIREMENTS |
| REMOVED |

MIL-M-38510/40A
13 April 1984
SUPERSEDING
MIL-M-38510/40(USAF)
4 June 1973

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, TTL, HIGH SPEED,
AND-OR-INVERT GATES, MONOLITHIC SILICON

INACTIVE FOR NEW DESIGN AFTER DATE OF THIS REVISION

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic, silicon, TTL, HIGH SPEED, AND-OR-INVERT logic gating microcircuits. One product assurance class and a choice of case outlines and lead finishes are provided for each type and are reflected in the complete part number.

1.2 Part number. The part number shall be in accordance with MIL-M-38510, with the exception that the "JAN" or "J" certification shall not be used.

1.2.1 Device type. The device type shall be as shown in the following:

Device type	Circuit
01	Expandable Dual 2-wide, 2-input AND-OR-INVERT gate
02	Dual 2-wide, 2-input AND-OR-INVERT gate
03	Expandable 2-2-2-3 input AND-OR-INVERT gate
04	2-2-2-3 input AND-OR-INVERT gate
05	Expandable 2-wide, 4-input AND-OR-INVERT gate

1.2.2 Device class. The device class shall be the product assurance level as defined in MIL-M-38510.

1.2.3 Case outline. The case outline shall be designated as follows:

Outline letter	Case outline (see MIL-M-38510, appendix C)
A	F-1 (14-lead, 1/4" x 1/4"), flat package
B	F-3 (14-lead, 1/4" x 1/8"), flat package
C	D-1 (14-lead, 1/4" x 3/4"), dual-in-line package
D	F-2 (14-lead, 1/4" x 3/8"), flat package

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 V dc to +7.0 V dc
Input voltage range	-1.5 V dc at -12 mA to +5.5 V dc
Storage temperature range	-65°C to +150°C
Maximum power dissipation per device 1/:	
Device types 01, 02, 03, and 04	140 mW
Device type 05	75 mW
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC}):	
Cases A, B, and D	0.09°C/W
Case C	0.08°C/W
Junction temperature (T_J)	+175°C

1/ Must withstand the added P_D due to short circuit condition (e.g., I_{OS}) at one output or 5 seconds duration.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Rome Air Development Center (RBE-2), Griffiss AFB, NY 13441, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	4.5 V dc minimum to 5.5 V dc maximum
Minimum high-level input voltage (V_{IH})	2.0 V dc
Maximum low-level input voltage (V_{IL})	0.8 V dc
Normalized fanout (each output) 2/	10 maximum
Case operating temperature range (T_C)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specifications and standards. Unless otherwise specified, the following specifications and standards, 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 specification 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 specifications, standards, handbooks, drawings, and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Detail specification. The individual item requirements shall be in accordance with MIL-M-38510, and as specified herein.

3.2 Design, 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 Logic diagram. The logic diagram shall be as specified on figure 1.

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

3.2.4 Case outlines. Case outlines shall be as specified in MIL-M-38510 and in 1.2.3 herein.

3.3 Lead material and finish. The lead material and finish shall be in accordance with MIL-M-38510 and 6.4 herein.

3.4 Electrical performance characteristics. The electrical performance characteristics are as specified in table I, and apply over the full recommended case operating temperature range, unless otherwise specified.

3.5 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 III.

3.6 Marking. Marking shall be in accordance with MIL-M-38510 and 1.2 herein. The "JAN" and "J" certification mark shall not be used.

2/ The device shall fanout in both high and low levels to the specified number of inputs of the same device type as that being tested.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions	Limits		Unit
			Min	Max	
High-level output voltage	V_{OH}	V_{CC} = 4.5 V, V_{IN} = 0.8 V; I_{OH} = -500 µA 1/	2.4		V
Low-level output voltage	V_{OL}	V_{CC} = 4.5 V, I_{OL} = 20 mA; V_{IN} = 2.0 V for all inputs of gate under test		0.4	V
Input clamp voltage	V_{IC}	V_{CC} = 4.5 V, I_{IN} = -12 mA; T_C = +25°C		-1.5	V
High-level input current	I_{IH1}	V_{CC} = 5.5 V, V_{IN} = 2.4 V 2/		50	µA
High-level input current	I_{IH2}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 2/		100	µA
Low-level input current	I_{IL}	V_{CC} = 5.5 V, V_{IN} = 0.4 V 1/	-1.0	-2.0	mA
Short circuit output current	I_{OS}	V_{CC} = 5.5 V 2/ 3/	-40	-100	mA
High-level supply current Device types 01, 02 Device types 03, 04 Device type 05	I_{CCH}	V_{CC} = 5.5 V, V_{IN} = 0 V 2/		 13 11 6.4	 mA mA mA
Low-level supply current Device types 01, 02 Device types 03, 04 Device type 05	I_{CCL}	V_{CC} = 5.5 V, V_{IN} = 5.5 V 1/		 24 14 12	 mA mA mA
Expander input current 4/	I_X	V_{CC} = 4.5 V; V_{IN} = 1.4 V		-5.85	mA
Base-emitter voltage of output transistor 4/	V_{BE}	V_{CC} = 4.5 V; I_{OL} = 20 mA; I_X = 700 µA		1.1	V
Propagation delay time, high-to-low-level expander pins open	t_{PHL1}	C_L = 50 pF; R_L = 280Ω	2	18	ns
Propagation delay time, high-to-low-level 4/	t_{PHL2}	C_L = 50 pF; R_L = 280Ω; $C_{\overline{X}}$ = 15 pF	2	22	ns
Propagation delay time, low-to-high-level expander pins open	t_{PLH1}	C_L = 50 pF; R_L = 280Ω	2	18	ns
Propagation delay time, low-to-high-level 4/	t_{PLH2}	C_L = 50 pF; R_L = 280Ω; $C_{\overline{X}}$ = 15 pF	2	26	ns

1/ All unspecified inputs at 5.5 volts.

2/ All unspecified inputs grounded.

3/ Not more than one output should be shorted at a time.

4/ Device types 01, 03, and 05 only.

3.7 Manufacturer eligibility. To be eligible to supply microcircuits to this specification, a manufacturer shall have a manufacturer certification in accordance with MIL-M-38510 for at least one line. Not necessarily the line producing the device type described herein.

3.8 Certification. Certification in accordance with MIL-M-38510 is not required for this device.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroup (see table III)
	Class B devices
Interim electrical parameters (pre burn-in) (method 5004)	1
Final electrical test parameters (method 5004)	1*,2,3,9
Group A test requirements (method 5005)	1,2,3,9
Group C end-point electrical parameters (method 5005)	1,2,3
Additional electrical subgroups for group C periodic inspections	10,11

*PDA applies to subgroup 1 (see 4.2c).

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-M-38510 and methods 5005 and 5007, as applicable, of MIL-STD-883, except as modified 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 qualification and quality conformance inspection. The following additional criteria shall apply:

a. Burn-in (method 1015 of MIL-STD-883).

(1) Test condition D or E, using the circuit shown on figure 3, or equivalent.

(2) T_A = +125°C minimum.

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

c. The percent defective allowable (PDA) for class B devices shall be 10 percent based on failures from group A, subgroup 1 test after cooldown as final electrical test in accordance with method 5004 of MIL-STD-883, and with no intervening electrical measurements. If interim electrical parameter tests are performed prior to burn-in, failures resulting from pre burn-in screening may be excluded from the PDA. If interim electrical parameter tests prior to burn-in are omitted, then all screening failures shall be included in the PDA. The verified failures of group A, subgroup 1, after burn-in divided by the total number of devices submitted for burn-in in that lot shall be used to determine the percent defective for that lot, and the lot shall be accepted or rejected based on the PDA for the applicable device class.

4.3 Qualification inspection. Qualification inspection is not required.

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4). Generic test data (see 6.5) may be used to satisfy the requirements for groups C and D inspections. Quality conformance inspection shall be completed on the specific devices covered by this specification before they are shipped.

4.4.1 Group A inspection. Group A inspection shall be in accordance with table I of method 5005 of MIL-STD-883 and as follows;

a. Tests shall be as specified in table II herein.

b. Subgroups 4, 5, 6, 7, and 8 of table I of method 5005 of MIL-STD-883 shall be omitted.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II of method 5005 of MIL-STD-883.

4.4.3 Group C inspection. Group C inspection shall be in accordance with table III of method 5005 of MIL-STD-883 and as follows:

a. End-point electrical parameters shall be as specified in table II herein.

b. Subgroups 3 and 4 shall be added to group C inspection parameters for class B devices and shall consist of the tests, conditions, and limits specified for subgroups 10 and 11 of group A.

c. Steady-state life test (method 1005 of MIL-STD-883) conditions:

(1) Test condition D or E, using the circuit shown on figure 3, or equivalent.

(2) T_A = +125°C minimum.

(3) Test duration: 1,000 hours, except as permitted by appendix B of MIL-M-38510.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table IV of method 5005 of MIL-STD-883. End-point electrical parameters shall be as specified in table II herein.

4.5 Methods of inspection. Methods of inspection shall be specified as follows:

4.5.1 Voltage and current. All voltages given are referenced to the microcircuit ground terminal. Currents given are conventional and positive when flowing into the referenced terminal.

5. PACKAGING

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

6. NOTES

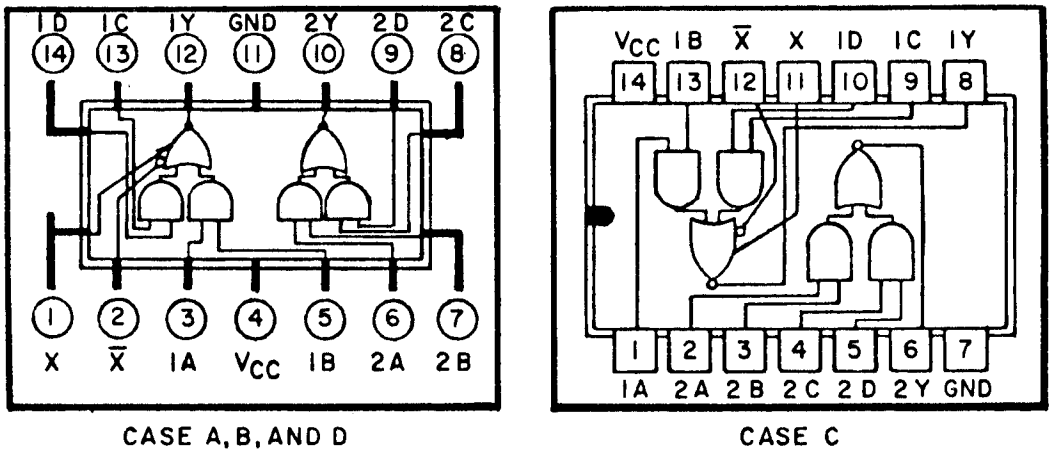
6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design applications and logisitic support of existing equipment.

6.2 Ordering data. The acquisition document should specify the following:

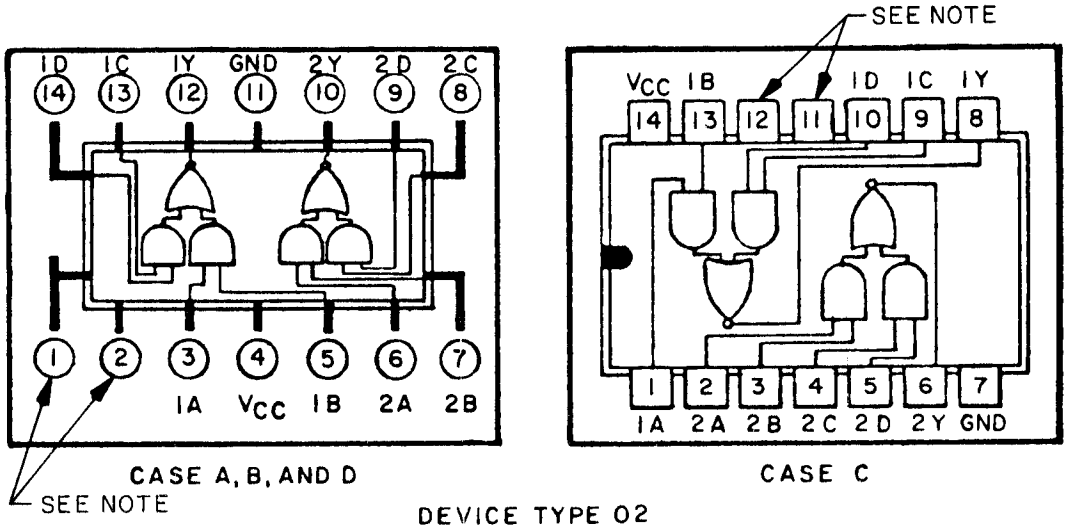
a. Complete part number (see 1.2).

b. Requirements for delivery of one copy of the quality conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.

c. Requirements for certificate of compliance, if applicable.



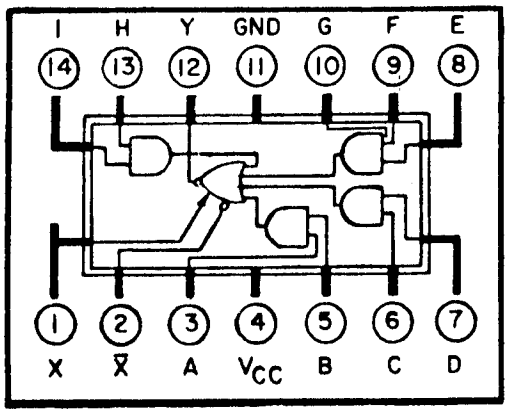
DEVICE TYPE 01



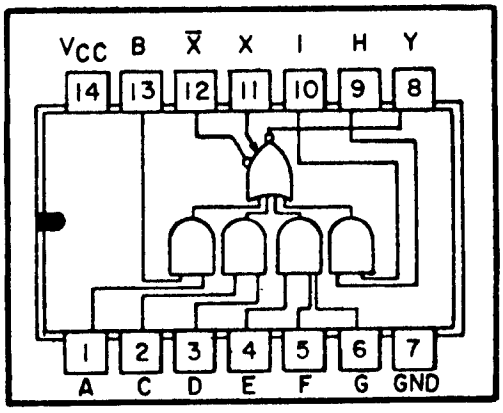
DEVICE TYPE 02

NOTE: Do not use as external tie points since they may be electrically connected internally.

FIGURE 1. Logic diagram and terminal connections (top views).

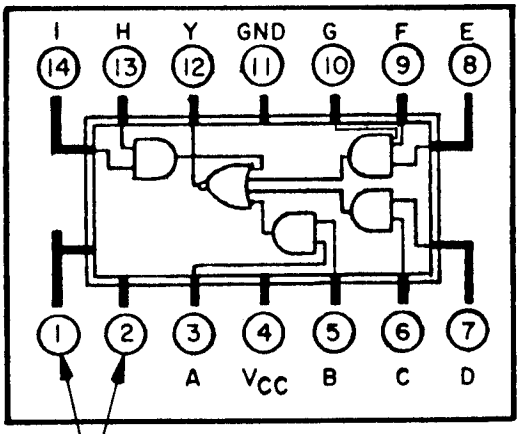


CASE A, B, AND D



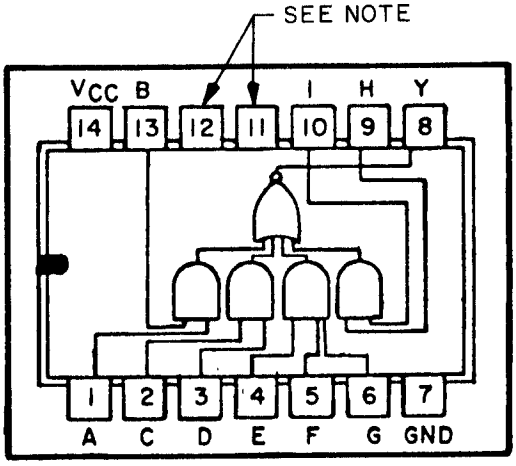
CASE C

DEVICE TYPE 03



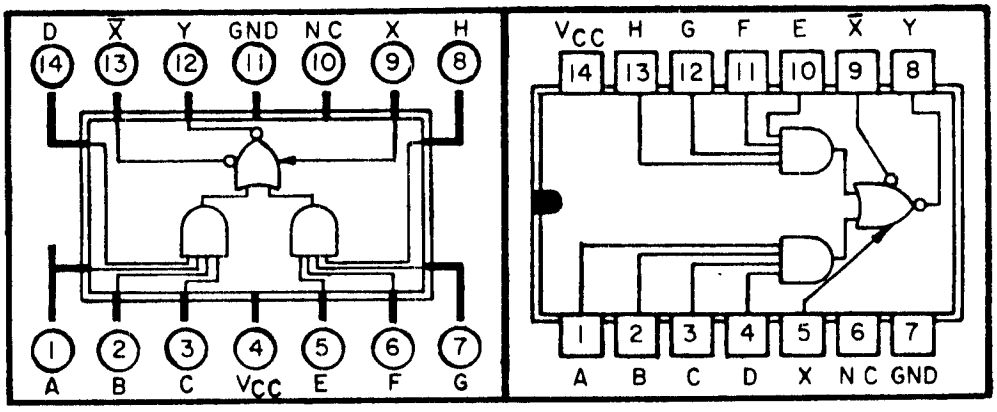
CASE A, B, AND D

SEE NOTE



CASE C

DEVICE TYPE 04



CASE A, B, AND D DEVICE TYPE 05 CASE C

NOTE: Do nct use as external tie points since they may be electrically connected internally.

FIGURE 1. Logic diagram and terminal connections (top view) - Continued.

Device Type 01

TRUTH TABLE (each gate)					
Input					Output
A	B	C	D	X	Y
H	H	*	*	*	L
*	*	H	H	*	L
*	*	*	*	H	L

* Either H or L

All other combinations of H and L at the input give H output.

Positive Logic: $Y = \overline{(AB) + (CD) + (X)}$

Device Type 02

TRUTH TABLE (each gate)				
Input				Output
A	B	C	D	Y
H	H	*	*	L
*	*	H	H	L

* Either H or L - All other combinations of H and L at the input give H output.

Positive Logic: $Y = \overline{(AB) + (CD)}$

FIGURE 2. Truth tables and logic equations.

Device Type 03

Input										Output
A	B	C	D	E	F	G	H	I	X	Y
H	H	*	*	*	*	*	*	*	*	L
*	*	H	H	*	*	*	*	*	*	L
*	*	*	*	H	H	H	*	*	*	L
*	*	*	*	*	*	*	H	H	*	L
*	*	*	*	*	*	*	*	*	H	L

* Either H or L - All other combinations of H and L at the input give H output.

Positive logic: $Y = \overline{(\overline{AB}) + (\overline{CD}) + (\overline{EFG}) + (\overline{HI}) + X}$

Device Type 04

Input									Output
A	B	C	D	E	F	G	H	I	Y
H	H	*	*	*	*	*	*	*	L
*	*	H	H	*	*	*	*	*	L
*	*	*	*	H	H	H	*	*	L
*	*	*	*	*	*	*	H	H	L

* Either H or L - All other combinations of H and L at the input give H output.

Positive logic: $Y = \overline{(\overline{AB}) + (\overline{CD}) + (\overline{EFG}) + (\overline{HI})}$

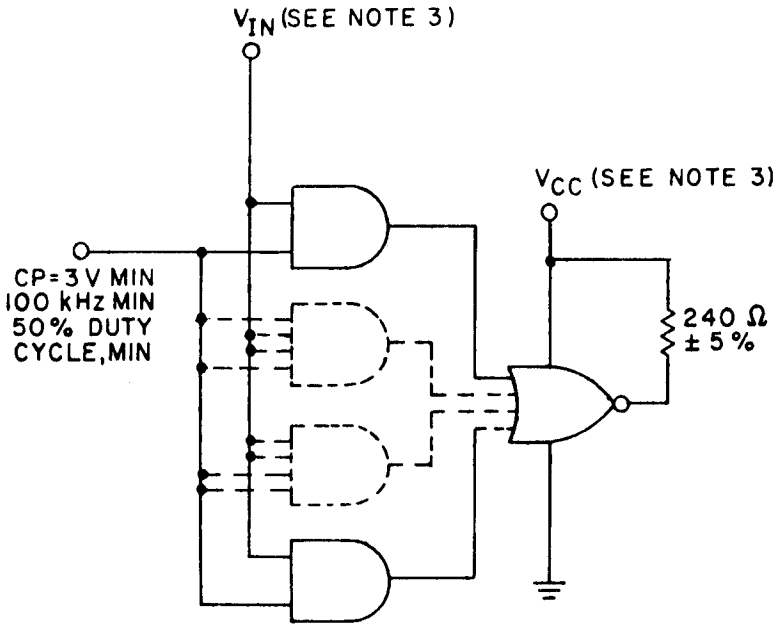
Device Type 05

Input									Output
A	B	C	D	E	F	G	H	X	Y
H	H	H	H	*	*	*	*	*	L
*	*	*	*	H	H	H	H	*	L
*	*	*	*	*	*	*	*	H	L

* Either H or L - All other combinations of H and L at the input give H output.

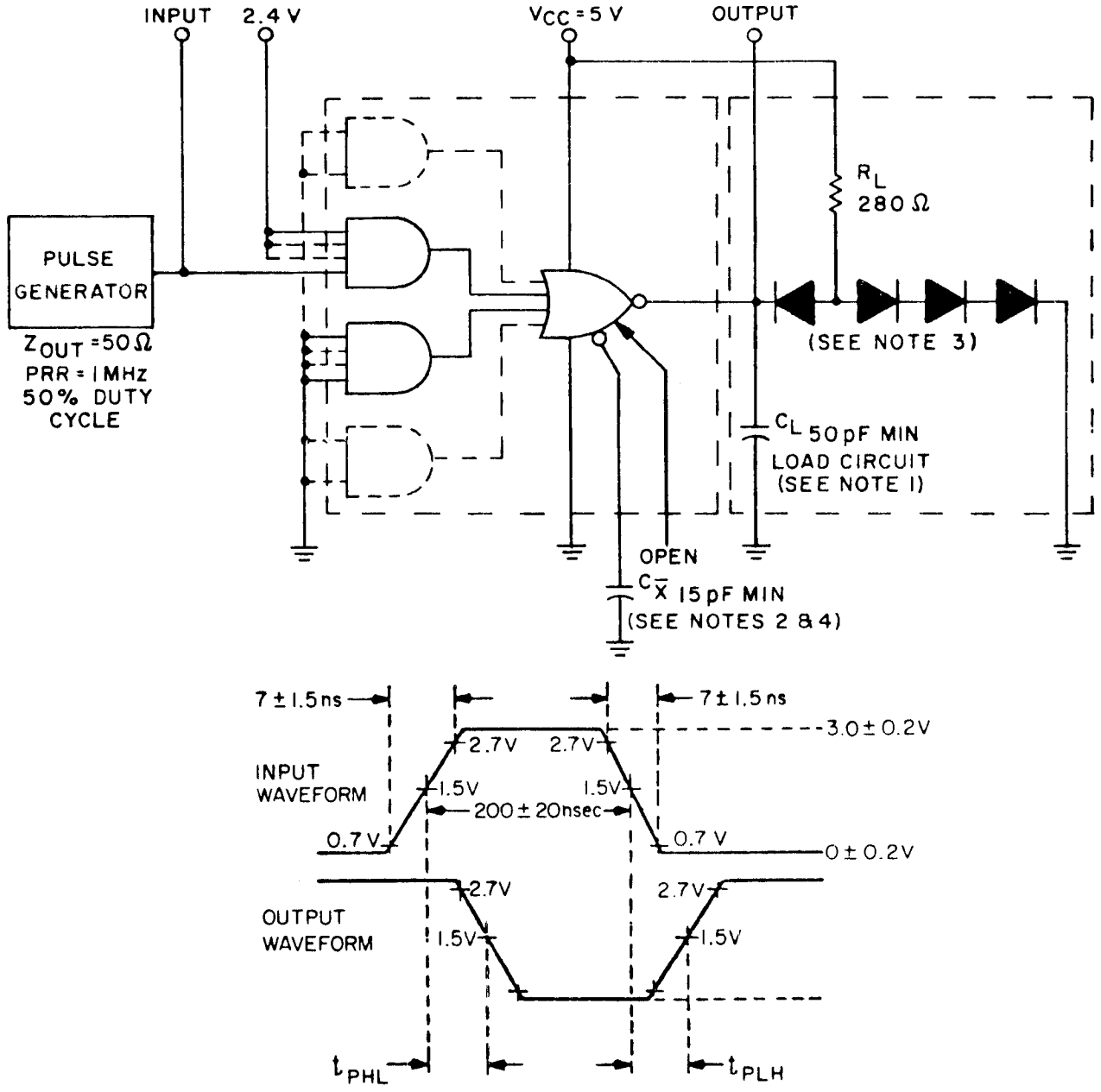
Positive logic: $Y = \overline{(\overline{ABCD}) + (\overline{EFGH}) + X}$

FIGURE 2. Truth tables and logic equations - Continued.



NOTES:
1. For -01 and -02 one gate is driven by CP and the other is driven by $\overline{CP}$.
2. Expander inputs are open.
3. V_{IN} and V_{CC} = 5 volts, minimum, at the device terminals.

FIGURE 3. Burn-in and life test circuit.



NOTES:
1. C_L includes probe and jig capacitances.
2. $C_{\bar{X}}$ includes jig capacitances. (Applies to device types 01, 03,and 05 only).
3. All diodes are 1N3064 or equivalent.
4. For t_{PLH1} and t_{PHL1}, no connection is made to $\bar{X}$.

FIGURE 4. Switching time test circuit.

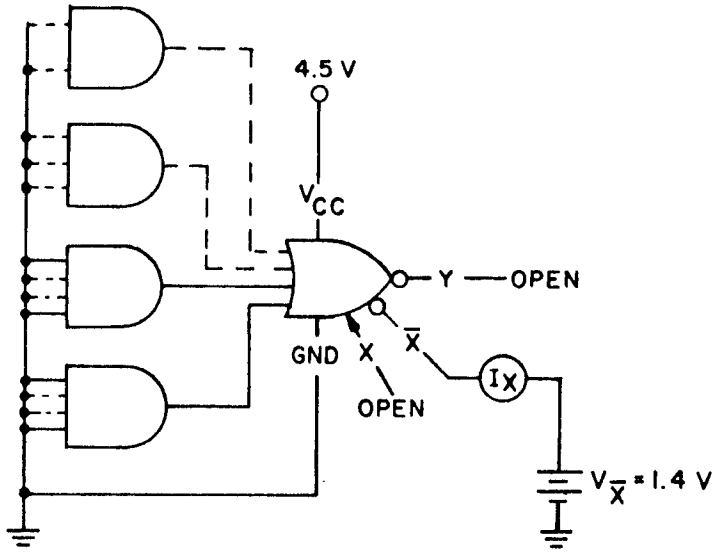


FIGURE 5. Expander current test circuit for device types 01, 03, and 05.

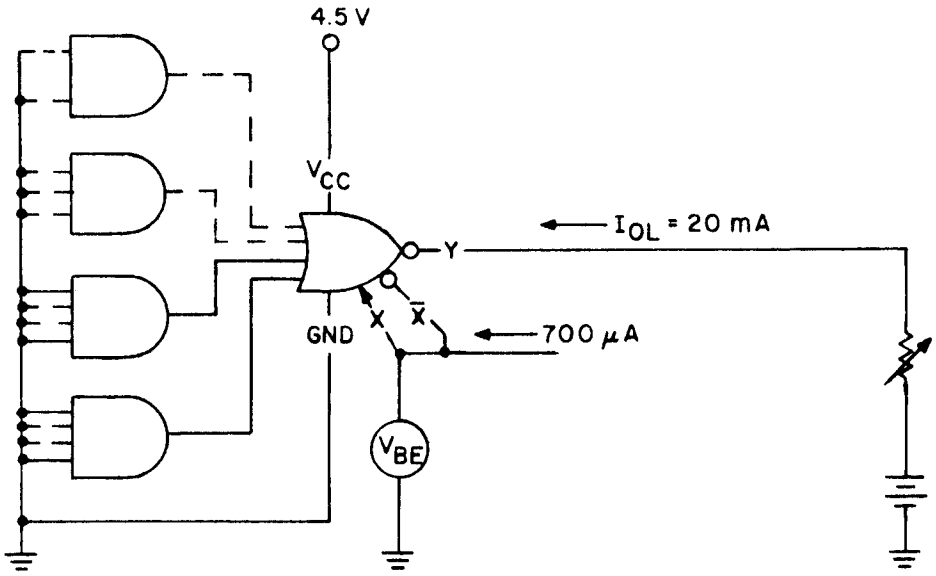


FIGURE 6. Base-emitter voltage test circuit for device types 01, 03, and 05.

TABLE III. Group A inspection for device type 01.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D / Case C / Test no.	1 / 11 / X	2 / 12 / $\overline{X}$	3 / 1 / 1A	4 / 14 / V_{CC}	5 / 13 / 1B	6 / 2 / 2A	7 / 3 / 2B	8 / 4 / 2C	9 / 5 / 2D	10 / 6 / 2Y	11 / 7 / GND	12 / 8 / 1Y	13 / 9 / 1C	14 / 10 / 1D	Measured terminal	Limits Min	Limits Max	Unit
1 T_C = +25°C	V_{OH}	3006	1			0.8 V	4.5 V	5.5 V						GND	-0.5 mA	GND	GND	1Y	2.4		V
	"	"	2			5.5 V	"	0.8 V						"	"	GND	GND	1Y	"		"
	"	"	3			GND	"	GND						"	"	0.8 V	5.5 V	1Y	"		"
	"	"	4			"	"	"						"	"	5.5 V	0.8 V	1Y	"		"
	"	"	5	0.32 mA	-0.32 mA	"	"	"						"	"	GND	GND	1Y	"		"
	"	"	5a 4/	0.4 V	-0.32 mA	"	"	"						"	"	GND	GND	1Y	"		"
	"	"	6				"		0.8 V	5.5 V	GND	GND	-0.5 mA	"				2Y	"		
	"	"	7				"		5.5 V	0.8 V	GND	GND	"	"				2Y	"		
	"	"	8				"		GND	GND	0.8 V	5.5 V	"	"				2Y	"		
	"	"	9				"		GND	GND	5.5 V	0.8 V	"	"				2Y	"		
	V_{OL}	3007	10			2.0 V	"	2.0 V						"	20 mA	GND	GND	1Y		0.4	"
	"	"	11			GND	"	GND						"	"	2.0 V	2.0 V	1Y		"	"
	"	"	12	0.47 mA	1/	"	"	"						"	"	GND	GND	1Y		"	"
	"	"	12a 4/	3.8 mA	1.3 V	"	"	"						"	"	GND	GND	1Y		"	"
	"	"	13				"		2.0 V	2.0 V	GND	GND	20 mA	"				2Y		"	"
	"	"	14				"		GND	GND	2.0 V	2.0 V	20 mA	"				2Y		"	"
	I_{IL}	3009	15			0.4 V	5.5 V	5.5 V						"				1A	-1.0	-2.0	mA
	"	"	16			5.5 V	"	0.4 V						"				1B	"	"	
	"	"	17				"							"		0.4 V	5.5 V	1C	"	"	
	"	"	18				"							"		5.5 V	0.4 V	1D	"	"	
	"	"	19				"		0.4 V	5.5 V				"				2A	"	"	"
	"	"	20				"		5.5 V	0.4 V				"				2B	"	"	"
	"	"	21				"				0.4 V	5.5 V		"				2C	"	"	"
	"	"	22				"				5.5 V	0.4 V		"				2D	"	"	"
	I_{IH1}	3010	23			2.4 V	"	GND						"				1A		50	µA
	"	"	24			GND	"	2.4 V						"				1B		"	"
	"	"	25				"							"				1C		"	"
	"	"	26				"							"		2.4 V	GND	1D		"	"
	"	"	27				"		2.4 V	GND				"		GND	2.4 V	2A		"	"
	"	"	28				"		GND	2.4 V				"				2B		"	"
	"	"	29				"				2.4 V	GND		"				2C		"	"
	"	"	30				"				GND	2.4 V		"				2D		"	"
	I_{IH2}	"	31			5.5 V	"	GND						"				1A		100	"
	"	"	32			GND	"	5.5 V						"				1B		"	"
	"	"	33				"							"		5.5 V	GND	1C		"	"
	"	"	34				"							"		GND	5.5 V	1D		"	"
	"	"	35				"		5.5 V	GND				"				2A		"	
	"	"	36				"		GND	5.5 V				"				2B			
	"	"	37				"				5.5 V	GND		"				2C		"	
	"	"	38				"				GND	5.5 V		"				2D		"	"
	I_{OS}	3011	39			GND	"	GND						"	GND	GND	GND	1Y	-40	-100	mA
	"	"	40				"		GND	GND	GND	GND	GND	"				2Y	"	"	"
	I_{CCL}	3005	41			5.5 V	"	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V		"		5.5 V	5.5 V	V_{CC}		24	"
	"	"	42			GND	"	GND	GND	GND	GND	GND		"		GND	GND	V_{CC}		13	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 01 - Continued.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D Case C Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits Min	Limits Max	Unit
				11	12	1	14	13	2	3	4	5	6	7	8	9	10				
				X	$\overline{X}$	1A	V_{CC}	1B	2A	2B	2C	2D	2Y	GND	1Y	1C	1D				
1 T_C = +25°C	V_{IC}		43			-12 mA	4.5 V							GND				1A		-1.5	V
			44				"	-12 mA						"				1B		"	"
			45				"							"		-12 mA		1C		"	"
			46				"							"			-12 mA	1D		"	"
			47				"		-12 mA					"				2A		"	"
			48				"			-12 mA				"				2B		"	"
			49				"				-12 mA			"				2C		"	"
			50				"					-12 mA		"				2D		"	"
	I_X	2/	51		1.4 V	GND	"	GND	GND	GND	GND	GND		"		GND	GND	$\overline{X}$		-5.85	mA
	V_{BE}	3/	52	0.7 mA		GND	"	GND	GND	GND	GND	GND		"	20 mA	GND	GND	X		1.1	V
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				
9 T_C = +25°C	t_{PHL1}	3003 Fig. 5	53			IN	5.0 V	2.4 V						GND	OUT	GND	GND	1A to 1Y	2	13	ns
			54				"		IN	2.4 V	GND	GND	OUT	"				2A to 2Y	"	13	"
	t_{PHL2}	"	55			IN	"	2.4 V						"	OUT	GND	GND	1A to 1Y	"	15	"
	t_{PLH1}	"	56			IN	"	2.4 V						"	OUT	GND	GND	1A to 1Y	"	14	"
		"	57				"		IN	2.4 V	GND	GND	OUT	"				2A to 2Y	"	14	"
	t_{PLH2}	"	58			IN	"	2.4 V						"	OUT	GND	GND	1A to 1Y	"	18	"
10 T_C = +125°C	t_{PHL1}	"	59			IN	"	2.4 V						"	OUT	GND	GND	1A to 1Y	"	"	"
		"	60				"		IN	2.4 V	GND	GND	OUT	"				2A to 2Y	"	"	"
	t_{PHL2}	"	61			IN	"	2.4 V						"	OUT	GND	GND	1A to 1Y	"	22	"
	t_{PLH1}	"	62			IN	"	2.4 V						"	OUT	GND	GND	1A to 1Y	"	18	"
		"	63				"		IN	2.4 V	GND	GND	OUT	"				2A to 2Y	"	"	"
	t_{PLH2}	"	64			IN	"	2.4 V						"	OUT	GND	GND	1A to 1Y	"	26	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C.																				

1/ R_1 = 68 ohms between X and $\overline{X}$.

2/ See figure 6.

3/ See figure 7.

4/ At the manufacturer's option, the high and low level output voltage tests for the expanded inputs may be verified by performing either tests 5 and 12 or 5a and 12a.

TABLE III. Group A inspection for device type 02.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D / Case C / Test no.	1 / 11 / NC	2 / 12 / NC	3 / 1 / 1A	4 / 14 / V_{CC}	5 / 13 / 1B	6 / 2 / 2A	7 / 3 / 2B	8 / 4 / 2C	9 / 5 / 2D	10 / 6 / 2Y	11 / 7 / GND	12 / 8 / 1Y	13 / 9 / 1C	14 / 10 / 1D	Measured terminal	Limits Min	Limits Max[1]	Unit
1 T_C = +25°C	V_{OH}	3006	1			0.8 V	4.5 V	5.5 V						GND	-0.5 mA	GND	GND	1Y	2.4		V
		"	2			5.5 V	"	0.8 V						"	"	GND	GND	1Y	"		"
		"	3			GND	"	GND						"	"	0.8 V	5.5 V	1Y	"		"
		"	4			GND	"	GND						"	"	5.5 V	0.8 V	1Y	"		"
		"	5				"		0.8 V	5.5 V	GND	GND	-0.5 mA	"				2Y	"		"
		"	6				"		5.5 V	0.8 V	GND	GND	"	"				2Y	"		"
		"	7				"		GND	GND	0.8 V	5.5 V	"	"				2Y	"		"
		"	8				"		GND	GND	5.5 V	0.8 V	"	"				2Y	"		"
	V_{OL}	3007	9			2.0 V	"	2.0 V						"	20 mA	GND	GND	1Y		0.4	"
		"	10			GND	"	GND						"	20 mA	2.0 V	2.0 V	1Y		"	"
		"	11				"		2.0 V	2.0 V	GND	GND	20 mA	"				2Y		"	"
		"	12				"		GND	GND	2.0 V	2.0 V	20 mA	"				2Y		"	"
	I_{IL}	3009	13			0.4 V	5.5 V	5.5 V						"				1A	-1.0	-2.0	mA
		"	14			5.5 V	"	0.4 V						"				1B	"	"	"
		"	15				"							"		0.4 V	5.5 V	1C	"	"	"
		"	16				"							"		5.5 V	0.4 V	1D	"	"	"
		"	17				"		0.4 V	5.5 V				"				2A	"	"	"
		"	18				"		5.5 V	0.4 V				"				2B	"	"	"
		"	19				"				0.4 V	5.5 V		"				2C	"	"	"
		"	20				"				5.5 V	0.4 V		"				2D	"	"	"
	I_{IH1}	3010	21			2.4 V	"	GND						"				1A		50	µA
		"	22			GND	"	2.4 V						"				1B		"	"
		"	23				"							"		2.4 V	GND	1C		"	"
		"	24				"							"		GND	2.4 V	1D		"	"
		"	25				"		2.4 V	GND				"				2A		"	"
		"	26				"		GND	2.4 V				"				2B		"	"
		"	27				"				2.4 V	GND		"				2C		"	"
		"	28				"				GND	2.4 V		"				2D		"	"
	I_{IH2}	"	29			5.5 V	"	GND						"				1A		100	"
		"	30			GND	"	5.5 V						"				1B		"	"
		"	31				"							"		5.5 V	GND	1C		"	"
		"	32				"							"		GND	5.5 V	1D		"	"
		"	33				"		5.5 V	GND				"				2A		"	"
		"	34				"		GND	5.5 V				"				2B		"	"
		"	35				"				5.5 V	GND		"				2C		"	"
		"	36				"				GND	5.5 V		"				2D		"	"
	I_{OS}	3011	37			GND	"	GND						"	GND	GND	GND	1Y	-40	-100	mA
		"	38				"		GND	GND	GND	GND	GND	"				2Y	-40	-100	"
	I_{CCL}	3005	39			5.5 V	"	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V		"		5.5 V	5.5 V	V_{CC}		24	"
	I_{CCH}	"	40			GND	"	GND	GND	GND	GND	GND		"		GND	GND	V_{CC}		13	"
	V_{IC}		41			-12 mA	4.5 V							"				1A		-1.5	V
			42				"	-12 mA						"				1B		"	"
			43				"							"		-12 mA		1C		"	"
			44				"							"			-12 mA	1D		"	"
			45				"		-12 mA					"				2A		"	"
			46				"			-12 mA				"				2B		"	"
			47				"				-12 mA			"				2C		"	"
			48				"					-12 mA		"				2D		"	"

TABLE III. Group A inspection for device type 02 - Continued.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D Case C Test no.	1 NC	2 NC	3 1A	4 V_{CC}	5 1B	6 2A	7 2B	8 2C	9 2D	10 2Y	11 GND	12 1Y	13 1C	14 1D	Measured terminal	Limits Min	Limits Max	Unit
			Cases A,B,D Case C	11	12	1	14	13	2	3	4	5	6	7	8	9	10				
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tessts are omitted.																				
9 T_C = +25°C	t_{PHL1}	3003 Fig. 5	49 50			IN	5.0 V "	2.4 V	IN	2.4 V	GND	GND	OUT	" "	OUT	GND	GND	1A to 1Y 2A to 2Y	2 "	13 "	ns "
	t_{PLH1}	" "	51 52			IN	" "	2.4 V	IN	2.4 V	GND	GND	OUT	" "	OUT	GND	GND	1A to 1Y 2A to 2Y	" "	14 "	" "
10 T_C = +125°C	t_{PHL1}	" "	53 54			IN	" "	2.4 V	IN	2.4 V	GND	GND	OUT	" "	OUT	GND	GND	1A to 1Y 2A to 2Y	" "	18 "	" "
	t_{PLH1}	" "	55 56			IN	" "	2.4 V	IN	2.4 V	GND	GND	OUT	" "	OUT	GND	GND	1A to 1Y 2A to 2Y	" "	" "	" "
	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C																				

TABLE III. Group A inspection for device type 03.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D / Case C / Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits Min	Limits Max	Unit
				11	12	1	14	13	2	3	4	5	6	7	8	9	10				
				X	$\overline{X}$	A	V_{CC}	B	C	D	E	F	G	GND	Y	H	I				
1 T_C = +25°C	V_{OH}	3006	1			0.8 V	4.5 V	5.5 V	0.8 V	5.5 V	0.8 V	5.5 V	5.5 V	GND	-0.5 mA	0.8 V	5.5 V	Y	2.4		V
		"	2			5.5 V	"	0.8 V	5.5 V	0.8 V	5.5 V	0.8 V	5.5 V	"	"	5.5 V	0.8 V	Y	"		"
		"	3			5.5 V	"	0.8 V	5.5 V	0.8 V	5.5 V	5.5 V	0.8 V	"	"	5.5 V	0.8 V	Y	"		"
		"	4	0.32 mA	-0.32 mA	GND	"	GND	GND	GND	GND	GND	GND	"	"	GND	GND	Y	"		"
		"	4a 4/	0.4 V	-0.32 mA	GND	"	GND	GND	GND	"	"	"	"	"	"	"	Y	"		"
	V_{OL}	3007	5			2.0 V	"	2.0 V	GND	GND	"	"	"	"	20 mA	"	GND	Y		0.4	"
		"	6			GND	"	GND	2.0 V	2.0 V	"	"	"	"	"	"	GND	Y		"	"
		"	7			"	"	"	GND	GND	2.0 V	2.0 V	2.0 V	"	"	"	GND	Y		"	"
		"	8			"	"	"	"	"	GND	GND	GND	"	"	2.0 V	2.0 V	Y		"	"
		"	9	0.47 mA	1/	"	"	"	"	"	"	"	"	"	"	GND	GND	Y		"	"
		"	9a 4/	3.8 mA	1.3 V	"	"	"	"	"	"	"	"	"	"	"	"	Y		"	"
	I_{IL}	3009	10			0.4 V	5.5 V	5.5 V						"				A	-1.0	-2.0	mA
		"	11			5.5 V	"	0.4 V						"				B	"	"	"
		"	12				"		0.4 V	5.5 V				"				C	"	"	"
		"	13				"		5.5 V	0.4 V				"				D	"	"	"
		"	14				"				0.4 V	5.5 V	5.5 V	"				E	"	"	"
		"	15				"				5.5 V	0.4 V	5.5 V	"				F	"	"	"
		"	16				"				5.5 V	5.5 V	0.4 V	"				G	"	"	"
		"	17				"							"		0.4 V	5.5 V	H	"	"	"
		"	18				"							"		5.5 V	0.4 V	I	"	"	"
	I_{IH1}	3010	19			2.4 V	"	GND						"				A		50	µA
		"	20			GND	"	2.4 V						"				B		"	"
		"	21				"		2.4 V	GND				"				C		"	"
		"	22				"		GND	2.4 V				"				D		"	"
		"	23				"				2.4 V	GND	GND	"				E		"	"
		"	24				"				GND	2.4 V	GND	"				F		"	"
		"	25				"				GND	GND	2.4 V	"				G		"	"
		"	26				"							"		2.4 V	GND	H		"	"
		"	27				"							"		GND	2.4 V	I		"	"
	I_{IH2}	"	28			5.5 V	"	GND						"				A		100	"
		"	29			GND	"	5.5 V						"				B		"	"
		"	30				"		5.5 V	GND				"				C		"	"
		"	31				"		GND	5.5 V				"				D		"	"
		"	32				"				5.5 V	GND	GND	"				E		"	"
		"	33				"				GND	5.5 V	GND	"				F		"	"
		"	34				"				GND	GND	5.5 V	"				G		"	"
		"	35				"							"		5.5 V	GND	H		"	"
		"	36				"							"		GND	5.5 V	I		"	"
	I_{OS}	3011	37			GND	"	GND	GND	GND	GND	GND	GND	"	GND	GND	GND	Y	-40	-100	mA
	I_{CCL}	3005	38			5.5 V	"	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	"		5.5 V	5.5 V	V_{CC}		14	"
	I_{CCH}	"	39			GND	"	GND	GND	GND	GND	GND	GND	"		GND	GND	V_{CC}		11	"

See footnotes at end of device type 03.

TABLE III. Group A inspection for device type 03 - Continued.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D / Case C / Test no.	1 / 11 / X	2 / 12 / $\overline{X}$	3 / 1 / A	4 / 14 / V_{CC}	5 / 13 / B	6 / 2 / C	7 / 3 / D	8 / 4 / E	9 / 5 / F	10 / 6 / G	11 / 7 / GND	12 / 8 / Y	13 / 9 / H	14 / 10 / I	Measured terminal	Limits Min	Limits Max	Unit
1 T_C = +25°C	V_{IC}		40 41 42 43 44 45 46 47 48			-12 mA	4.5 V " " " " " " " "	-12 mA	-12 mA	-12 mA	-12 mA	-12 mA	-12 mA	GND " " " " " " " "		-12 mA	-12 mA	A B C D E F G H I		-1.5 " " " " " " " "	V " " " " " " " "
	I_X	2/	49		1.4 V	GND	"	GND	GND	GND	GND	GND	GND	"		GND	GND	$\overline{X}$		-5.85	mA
	V_{BE}	3/	50	0.7 mA		GND	"	GND	GND	GND	GND	GND	GND	"	20 mA	GND	GND	X		1.1	V
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				
9 T_C = +25°C	t_{PHL1}	3003 Fig. 5	51			IN	5.0 V	2.4 V	GND	GND	GND	GND	GND	GND	OUT	GND	GND	A to Y	2	13	ns
	t_{PLH1}	"	52			"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	14	"
	t_{PHL2}	"	53			"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	15	"
	t_{PLH2}	"	54			"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	18	"
10 T_C = +125°C	t_{PHL1}	"	55			"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	"	"
	t_{PLH1}	"	56			"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	"	"
	t_{PHL2}	"	57			"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	22	"
	t_{PLH2}	"	58			"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	26	"
11	Same tests, terminal conditions, and limits as for subgroup 10, except T_C = -55°C																				

1/ R_1 = 68 ohms between X and X.

2/ See figure 6.

3/ See figure 7.

4/ At the manufacturer's option, the high and low level output voltage tests for the expanded inputs may be verified by performing either tests 4 and 9 or 4a and 9a.

TABLE III. Group A inspection for device type 04.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D / Case C / Test no.	1 / 11 / NC	2 / 12 / NC	3 / 1 / A	4 / 14 / V_{CC}	5 / 13 / B	6 / 2 / C	7 / 3 / D	8 / 4 / E	9 / 5 / F	10 / 6 / G	11 / 7 / GND	12 / 8 / Y	13 / 9 / H	14 / 10 / I	Measured terminal	Limits Min	Limits Max	Unit
1 T_C = +25°C	V_{OH}	3006	1			0.8 V	4.5 V	5.5 V	0.8 V	5.5 V	0.8 V	5.5 V	5.5 V	GND	-0.5 mA	0.8 V	5.5 V	Y	2.4		V
		"	2			5.5 V	"	0.8 V	5.5 V	0.8 V	5.5 V	5.5 V	5.5 V	"	"	5.5 V	0.8 V	Y	"		"
		"	3			5.5 V	"	0.8 V	5.5 V	0.8 V	5.5 V	5.5 V	0.8 V	"	"	5.5 V	0.8 V	Y	"		"
	V_{OL}	3007	4			2.0 V	"	2.0 V	GND	GND	GND	GND	GND	"	20 mA	GND	GND	Y		0.4	"
		"	5			GND	"	GND	2.0 V	2.0 V	GND	GND	GND	"	"	"	"	Y		"	"
		"	6			"	"	"	GND	GND	2.0 V	2.0 V	2.0 V	"	"	"	"	Y		"	"
		"	7			"	"	"	GND	GND	GND	GND	GND	"	"	2.0 V	2.0 V	Y		"	"
	I_{IL}	3009	8			0.4 V	5.5 V	5.5 V						"				A	-1.0	-2.0	mA
		"	9			5.5 V	"	0.4 V						"				B	"	"	"
		"	10				"		0.4 V	5.5 V				"				C	"	"	"
		"	11				"		5.5 V	0.4 V				"				D	"	"	"
		"	12				"				0.4 V	5.5 V	5.5 V	"				E	"	"	"
		"	13				"				5.5 V	0.4 V	5.5 V	"				F	"	"	"
		"	14				"				5.5 V	5.5 V	0.4 V	"				G	"	"	"
		"	15				"							"		0.4 V	5.5 V	H	"	"	"
		"	16				"							"		5.5 V	0.4 V	I	"	"	"
	I_{IH1}	3010	17			2.4 V	"	GND						"				A		50	µA
		"	18			GND	"	2.4 V						"				B		"	"
		"	19				"		2.4 V	GND				"				C		"	"
		"	20				"		GND	2.4 V				"				D		"	"
		"	21				"				2.4 V	GND	GND	"				E		"	"
		"	22				"				GND	2.4 V	GND	"				F		"	"
		"	23				"				GND	GND	2.4 V	"				G		"	"
		"	24				"							"		2.4 V	GND	H		"	"
		"	25				"							"		GND	2.4 V	I		"	"
	I_{IH2}	"	26			5.5 V	"	GND						"				A		100	"
		"	27			GND	"	5.5 V						"				B		"	"
		"	28				"		5.5 V	GND				"				C		"	"
		"	29				"		GND	5.5 V				"				D		"	"
		"	30				"				5.5 V	GND	GND	"				E		"	"
		"	31				"				GND	5.5 V	GND	"				F		"	"
		"	32				"				GND	GND	5.5 V	"				G		"	"
		"	33				"							"		5.5 V	GND	H		"	"
		"	34				"							"		GND	5.5 V	I		"	"
	I_{OS}	3011	35			GND	"	GND	GND	GND	GND	GND	GND	"	GND	GND	GND	Y	-40	-100	mA
	I_{CCL}	3005	36			5.5 V	"	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	5.5 V	"		5.5 V	5.5 V	V_{CC}		14	"
	I_{CCH}	"	37			GND	"	GND	GND	GND	GND	GND	GND	"		GND	GND	V_{CC}		11	"
	V_{IC}		38			-12 mA	4.5 V							"				A		-1.5	V
			39				"	-12 mA						"				B		"	"
			40				"		-12 mA					"				C		"	"
			41				"			-12 mA				"				D		"	"
			42				"				-12 mA			"				E		"	"
			43				"					-12 mA		"				F		"	"
			44				"						-12 mA	"				G		"	"
			45				"							"		-12 mA		H		"	"
			46				"							"			-12 mA	I		"	"

TABLE III. Group A in. . for device type 04 - Continued.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D / Case C / Test no.	1 / 11 / NC	2 / 12 / NC	3 / 1 / A	4 / 14 / V_{CC}	5 / 13 / B	6 / 2 / C	7 / 3 / D	8 / 4 / E	9 / 5 / F	10 / 6 / G	11 / 7 / GND	12 / 8 / Y	13 / 9 / H	14 / 10 / I	Measured terminal	Limits Min	Limits Max	Unit
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				
9 T_C = +25°C	t_{PHL1}	3003 Fig. 5	47			1N	5.0 V	2.4 V	GND	GND	GND	GND	GND	GND	OUT	GND	GND	A to Y	2	13	ns
	t_{PLH1}	"	48			"	"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	14	"
10 T_C = +125°C	t_{PHL1}	"	49			"	"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	18	"
	t_{PLH1}	"	50			"	"	"	"	"	"	"	"	"	"	"	"	"	A to Y	"	18	"
11	Same tests, terminal conditions, and limits as subgroup 10, except T_C = -55°C.																				

TABLE III. Group A inspection for device type 05.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D Case C Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits Min	Limits Max	Unit
				1	2	3	14	10	11	12	13	5	6	7	8	9	4				
				A	B	C	V_{CC}	E	F	G	H	X	NC	GND	Y	$\overline{X}$	D				
1 T_C = +25°C	V_{OH}	3006	1	0.8 V	5.5 V	5.5 V	4.5 V	GND	GND	GND	GND			GND	-0.5 mA		5.5 V	Y	2.4		V
		"	2	GND	GND	GND	"	0.8 V	5.5 V	5.5 V	5.5 V			"	"		GND	Y	"		"
		"	3	"	"	"	"	GND	GND	GND	GND	0.32 mA		"	"	-0.32 mA	"	Y	"		"
		"	3a 4/	"	"	"	"	"	"	"	"	0.4 V		"	"	-0.32 mA	"	Y			
	V_{OL}	3007	4	2.0 V	2.0 V	2.0 V	"	"	"	"	"			"	20 mA		2.0 V	Y		0.4	"
		"	5	GND	GND	GND	"	2.0 V	2.0 V	2.0 V	2.0 V			"	"		GND	Y		"	"
		"	6	"	"	"	"	GND	GND	GND	GND	0.47 mA		"	"	1/	"	Y		"	"
		"	6a 4/	"	"	"	"	"	"	"	"	3.8 mA		"	"	1.3 V	"	Y			
	I_{IL}	3009	7	0.4 V	5.5 V	5.5 V	5.5 V							"			5.5 V	A	-1.0	-2.0	mA
		"	8	5.5 V	0.4 V	5.5 V	"							"			"	B	"	"	"
		"	9	"	5.5 V	0.4 V	"							"			"	C	"	"	"
		"	10		5.5 V	5.5 V	"							"			0.4 V	D	"	"	"
		"	11				"	0.4 V	5.5 V	5.5 V	5.5 V			"				E	"	"	"
		"	12				"	5.5 V	0.4 V	5.5 V	"			"				F	"	"	"
		"	13				"	"	5.5 V	0.4 V	"			"				G	"	"	"
		"	14				"				0.4 V			"				H	"	"	"
	I_{IH1}	3010	15	2.4 V	GND	GND	"							"			GND	A		50	µA
		"	16	GND	2.4 V	GND	"							"			"	B		"	"
		"	17	"	GND	2.4 V	"							"			"	C		"	"
		"	18	"	GND	GND	"							"			2.4 V	D		"	"
		"	19				"	2.4 V	GND	GND	GND			"				E		"	"
		"	20				"	GND	2.4 V	GND	"			"				F		"	"
		"	21				"	"	GND	2.4 V	"			"				G		"	"
		"	22				"			GND	2.4 V			"				H		"	"
	I_{IH2}	"	23	5.5 V	GND	GND	"							"			GND	A		100	"
		"	24	GND	5.5 V	GND	"							"			"	B		"	"
		"	25	"	GND	5.5 V	"							"			"	C		"	"
		"	26	"	GND	GND	"							"			5.5 V	D		"	"
		"	27				"	5.5 V	GND	GND	GND			"				E		"	"
		"	28				"	GND	5.5 V	GND	"			"				F		"	"
		"	29				"	"	GND	5.5 V	"			"				G		"	"
		"	30				"			GND	5.5 V			"				H		"	"
	I_{OS}	3011	31	GND	GND	GND	"	"	"	GND	GND			"	GND		GND	Y	-40	-100	mA
	I_{CCL}	3005	32	5.5 V	5.5 V	5.5 V	"	5.5 V	5.5 V	5.5 V	5.5 V			"			5.5 V	V_{CC}		12	"
	I_{CCH}	3005	33	GND	GND	GND	"	GND	GND	GND	GND			"			GND	V_{CC}		6.4	"
	V_{IC}		34	-12 mA			4.5 V							"				A		-1.5	V
			35		-12 mA		"							"				B		"	"
			36			-12 mA	"							"				C		"	"
			37				"							"			-12 mA	D		"	"
			38				"	-12 mA						"				E		"	"
			39				"		-12 mA					"				F		"	"
			40				"			-12 mA				"				G		"	"
			41				"				-12 mA			"				H		"	"

See footnotes at end of table.

TABLE III. Group A in[illegible] for device type 05 - Continued.
Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
			Case C	1	2	3	14	10	11	12	13	5	6	7	8	9	4		Min	Max	
			Test no.	A	B	C	V_{CC}	E	F	G	H	X	NC	GND	Y	$\overline{X}$	D				
1 T_C = +25°C	I_X	2/	42	GND	GND	GND	4.5 V	GND	GND	GND	GND			GND		1.4 V	GND	$\overline{X}$		-5.85	mA
	V_{BE}	3/	43	GND	GND	GND	"	GND	GND	GND	GND	0.7 mA		"	20 mA		GND	X		1.1	V
2	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = +125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions, and limits as for subgroup 1, except T_C = -55°C and V_{IC} tests are omitted.																				
9 T_C = +25°C	t_{PHL1}	3003 Fig. 5	44	IN	2.4 V	2.4 V	5.0 V	GND	GND	GND	GND			GND	OUT		2.4 V	A to Y	2	13	ns
	t_{PLH1}	"	45	"	"	"	"	"	"	"	"			"	"		"	A to Y	"	14	"
	t_{PHL2}	"	46	"	"	"	"	"	"	"	"			"	"		"	A to Y	"	15	"
	t_{PLH2}	"	47	"	"	"	"	"	"	"	"			"	"		"	A to Y	"	18	"
10 T_C = +125°C	t_{PHL1}	"	48	"	"	"	"	"	"	"	"			"	"		"	A to Y	"	"	"
	t_{PLH1}	"	49	"	"	"	"	"	"	"	"			"	"		"	A to Y	"	"	"
	t_{PHL2}	"	50	"	"	"	"	"	"	"	"			"	"		"	A to Y	"	22	"
	t_{PLH2}	"	51	"	"	"	"	"	"	"	"			"	"		"	A to Y	"	26	"
11	Same tests and terminal conditions and limits as subgroup 10, except T_C = -55°C.																				

1/ R_1 = 68 ohms between X and $\overline{X}$.

2/ See figure 6.

3/ See figure 7.

4/ At the manufacturer's option, the high and low level output voltage tests for the expanded inputs may be verified by performing either tests 3 and 6 or 3a and 6a.

d. Requirements for notification of change of product or process to the contracting activity in addition to notification to the qualifying activity, if applicable.

e. Requirements for packaging and packing.

f. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements shall not apply to direct purchase by or direct shipment to the Government.

6.3 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-M-38510, MIL-STD-1331, and as follows:

GND	Ground zero voltage potential.
I_{IN}	Current flowing into an input terminal.
T_C	Case temperature
V_{IN}	Voltage level at an input terminal.

6.4 Logistic support. Lead materials and finishes (see 3.3) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class B (see 1.2.2), lead material and finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

6.5 Generic test data. Generic test data may be used to satisfy the requirements of 4.4.3. Group C generic test data shall be on date codes no more than one year old and on a die in the same microcircuit group (see appendix E of MIL-M-38510) with the same material, design and process and from the same plant as the die represented. Group D (see 4.4.4) generic data shall be on date codes no more than one year old and on the same package type (see terms, definitions, and symbols of MIL-M-38510) and from the same plant as the package represented. The vendor is required to retain the generic data for a period of not less than 36 months from the date of shipment.

6.6 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information shall not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-M-38510.

Military device type	Generic-industry type
01	54H50
02	54H51
03	54H53
04	54H54
05	54H55

Custodians:
Army - ER
Navy - EC
Air Force - 17

Review activities:
Army - AR, MI
Navy - OS, SH
Air Force - 11, 19, 85, 99
DLA - ES

User activities:
Army - SM
Navy - AS, CG, MC

Agent:
DLA - ES

Preparing activity:
Air Force - 17

(Project 5962-0674-2)