MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, TTL, AND GATES,
MONOLITHIC SILICON

1. SCOPE

1.1 Scope. This specification covers the detail requirements for monolithic, silicon, TTL, positive AND logic gating microcircuits. Three product assurance classes and a choice of case outline/lead finish 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.

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

Device type	Circuit
01	Quadruple, 2-input positive AND gate
02	Quadruple, 2-input positive AND gate (open collector output)

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	MIL-M-38510, appendix C, case outline
A	F-1 (14-pin, 1/4" x 1/4", flat pack)
B	F-3 (14-pin, 1/8" x 1/4", flat pack)
C	D-1 (14-pin, 1/4" x 3/4", dual-in-line pack)
D	F-2 (14-pin, 1/4" x 3/8", flat-pack)

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 Vdc to 7.0 Vdc
Input voltage range	-1.5 Vdc at -12 mA to 5.5 Vdc
Storage temperature range	-65 °C to 150 °C
Maximum power dissipation per gate, P_D	50 mWdc 1/
Lead temperature (soldering 10 seconds)	300 °C
Thermal resistance, junction to case	θ_{JC} = {0.09 °C/mW for flat pack; 0.08 °C/mW for dual-in-line pack}
Junction temperature	T_J = 175 °C

1.4 Recommended operating conditions.

Supply voltage	4.5 Vdc minimum to 5.5 Vdc maximum
Maximum high level input voltage	5.0 Vdc
Minimum high level input voltage	2.0 Vdc
Maximum low level input voltage	0.8 Vdc
Minimum low level input voltage	0.0 Vdc
Normalized fanout (each output) 2/	10 maximum
Ambient operating temperature range	-55 °C to 125 °C

1/ Must withstand the added P_D due to short circuit conditions (e.g. I_{OS}) at one output for 5 seconds.
2/ Device will fanout in both high and low levels to the specified number of inputs of the same device type as that being tested.

2. APPLICABLE DOCUMENTS

2.1 The following documents, of the issue in effect on date of invitation for bids or request for proposal, forms 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, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Detail specifications. 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 Logic diagram and terminal connections. The logic diagram and terminal connections shall be as specified on figure 1.

3.2.2 Truth tables and logic equations. The truth tables and logic equations shall be as specified on figure 2.

3.2.3 Schematic circuit. The schematic circuit shall be as specified on figure 3.

3.2.4 Case outlines. The case outlines shall be in accordance with 1.2.3.

3.3 Lead material and finish. Lead material and finish shall be in accordance with MIL-M-38510.

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

3.5 Rebonding. Rebonding shall be in accordance with MIL-M-38510.

3.6 Electrical test requirements. Electrical test requirements shall be as specified in table III for the applicable device type and device class. The subgroups of table III which constitute the minimum electrical test requirements for screening, qualification, and quality conformance by device class are specified in table II.

3.7 Marking. Marking shall be in accordance with MIL-M-38510 and 1.2 herein. At the option of the manufacturer, the following marking may be omitted from the body of the microcircuit, but shall be retained on the initial container:

(a) Country of origin.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions	Device type	Limits		Units
				Min	Max	
High-level output voltage	V_{OH}	V_{CC} = 4.5V, V_{IN} = 2.0V I_{OH} = - 800 µA for all inputs of gate under test 1/	01	2.4	---	Volts
Low-level output voltage	V_{OL}	V_{CC} = 4.5V, I_{OL} = 16 mA V_{IN} = 0.8V for all inputs of gate under test 1/	All		0.4	Volts
Input clamp voltage	V_{IC}	V_{CC} = 4.5V, I_{IN} = -12 mA T_A = 25°C	All		-1.5	Volts
Maximum collector cut-off current	I_{CEX}	V_{CC} = 4.5V, V_{IN} = 2.0V V_{OH} = 5.5V	02		250	µA
High-level input current	I_{IH_1}	V_{CC} = 5.5V, V_{IN} = 2.4V 2/	All		40	µA
High-level input current	I_{IH_2}	V_{CC} = 5.5V, V_{IN} = 5.5V 2/	All		100	µA
Low-level input current	I_{IL}	V_{CC} = 5.5V, V_{IN} = 0.4V 1/	All	-0.7	-1.6	mA
Short-circuit output current	I_{OS}	V_{CC} = 5.5V 1/ 3/	01	-20	-55	mA
High-level supply current	I_{CCH}	V_{CC} = 5.5V 1/ V_{IN} = 5.5V	All		21	mA
Low-level supply current	I_{CCL}	V_{CC} = 5.5V 2/ V_{IN} = 0V	All		33	mA
Propagation delay time, high-to-low-level	t_{PHL}	C_L = 50 pF, R_L = 390Ω	01	3	32	ns
			02	3	38	ns
Propagation delay time, low-to-high-level	t_{PLH}	C_L = 50 pF, R_L = 390Ω	01	3	40	ns
			02	3	49	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.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirement	Subgroups (see table III)		
	Class A devices	Class B devices	Class C devices
Interim electrical parameters (pre burn-in) (Method 5004)	1	1	None
Final electrical test parameters (Method 5004)	1*, 2, 3, 9	1*, 2, 3, 9	1
Group A test requirements (Method 5005)	1, 2, 3, 9, 10, 11	1, 2, 3, 9	1, 2, 3, 9
Groups B and C end point electrical parameters (Method 5005)	1, 2, 3	1, 2, 3	1
Additional electrical subgroups for group C periodic inspections	None	10, 11	None

*PDA applies to subgroup 1 (see 4.3(h)).

4. PRODUCT ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-M-38510 and Method 5005 of MIL-STD-883, except as modified herein.

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified herein for groups A, B, and C inspections (see 4.4.1, 4.4.2, and 4.4.3). After qualification of one or more electrically and structurally similar types with a single lead finish, other lead finishes of the same case outline may be qualified by submitting a single type in the qualified case outline of the group B, subgroup 3 test and the group C, subgroups 1, 3, and 4 tests.

4.3 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) Test samples for the group B bond strength test specified in Method 5005 of MIL-STD-883 may, at the manufacturer's option, be randomly selected immediately following the internal visual (precap) inspection and prior to sealing (see 4.4.2(b)).
(b) Temperature cycling (Method 1010 of MIL-STD-883).
    (1) Omit seal test as post-test measurements.
(c) Thermal shock (Method 1011 of MIL-STD-883), when substituted for temperature cycling.
    (1) Omit seal test as post-test measurements.
(d) Burn-in test (Method 1015 of MIL-STD-883).
    (1) Test condition D or E, using the circuit shown on figure 4, or equivalent.
    (2) T_A = 125°C minimum.
(e) Reverse bias burn-in and interim electrical test in accordance with 3.1.10 of Method 5004 of MIL-STD-883 may be omitted.
(f) 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.
(g) External visual inspection shall not include measurement of case and lead dimensions.

(h) Percent defective allowable (PDA) - The PDA is specified as 5 percent for class A devices and 10 percent for class B devices 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.

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510.

4.4.1 Group A inspection. Group A inspection shall consist of the test subgroups and LTPD values shown in table I of Method 5005 of MIL-STD-883 and as follows:

(a) Tests shall be as specified in table II.
(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 consist of the test subgroups and LTPD values shown in table II of Method 5005 of MIL-STD-883 and as follows:

(a) Bond strength test may be conducted on samples collected prior to sealing (see 4.3(a)).

4.4.3 Group C inspection. Group C inspection shall consist of the test subgroups and LTPD values shown in table III of Method 5005 of MIL-STD-883 and as follows:

(a) End point electrical parameters shall be as specified in table II.
(b) Subgroups 7 and 8 shall be added to the group C inspection requirements for class B devices and shall consist of the tests, conditions and limits specified for subgroups 10 and 11 of group A.
(c) Lead bend in only one direction is required for initial conditioning prior to moisture resistance and salt atmosphere tests.
(d) High temperature storage test (Method 1008 of MIL-STD-883) conditions:
    (1) Temperature: 150° ±10°C.
    (2) Duration: 1,000 hours, except as otherwise permitted by Appendix B of MIL-M-38510.
(e) Operating life test (Method 1005 of MIL-STD-883) conditions:
    (1) Test condition D or E, using the circuit shown on figure 5, or equivalent.
    (2) T_A = 125°C, minimum.
    (3) Test duration: 1,000 hours, except as permitted by Appendix B or MIL-M-38510.
(f) Omit steady state reverse bias test.

4.5 Methods of examination and test. Methods of examination and test shall be as specified in the appropriate tables and as follows.

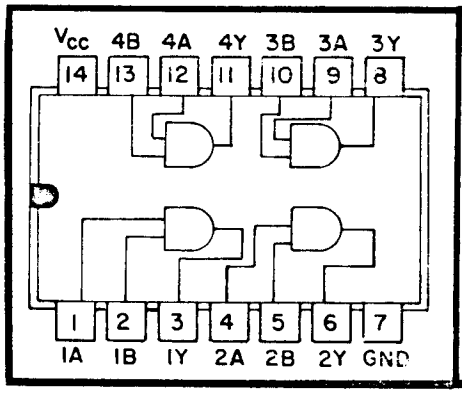
4.5.1 Voltage and current. All voltages given are referenced to the microcircuit ground terminal. Currents given are conventional current and positive when flowing into the referenced terminal.

4.5.2 Life test cooldown procedure. When devices are measured at 25°C following application of the operating life or burn-in test condition, they shall be cooled to room temperature prior to removal of the bias. Alternately, the bias may be removed during cooling if the case temperature is reduced to room temperature within 30 minutes after removal of the test condition.

4.6 Inspection of preparation for delivery. Inspection of preparation for delivery shall be in accordance with MIL-M-38510, except that the rough handling test shall not apply.

DEVICE TYPES 01 AND 02

Case C



Cases A, B, and D

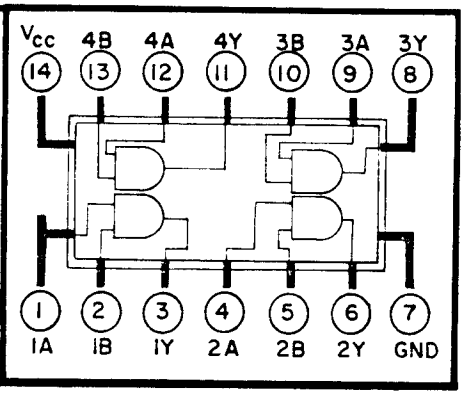


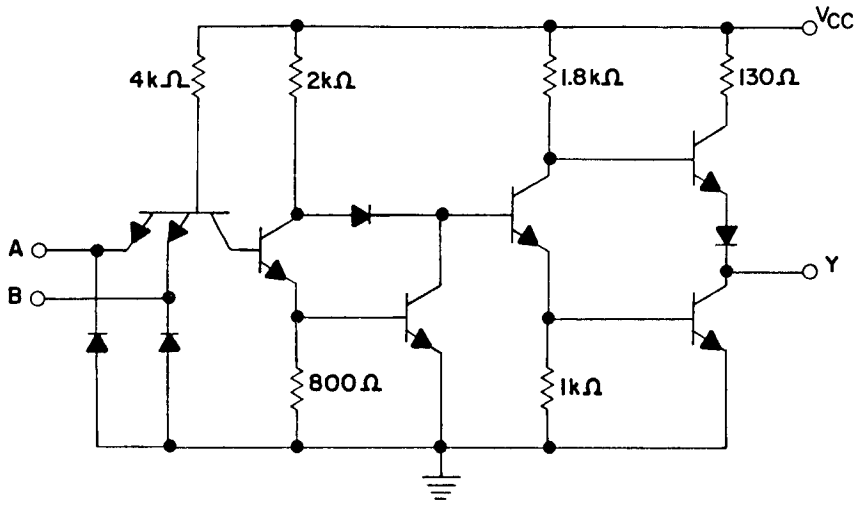
FIGURE 1. Logic diagram and terminal connections (top view).

DEVICE TYPES 01 AND 02

TRUTH TABLE (EACH GATE)		
INPUT		OUTPUT
A	B	Y
L	L	L
H	L	L
L	H	L
H	H	H

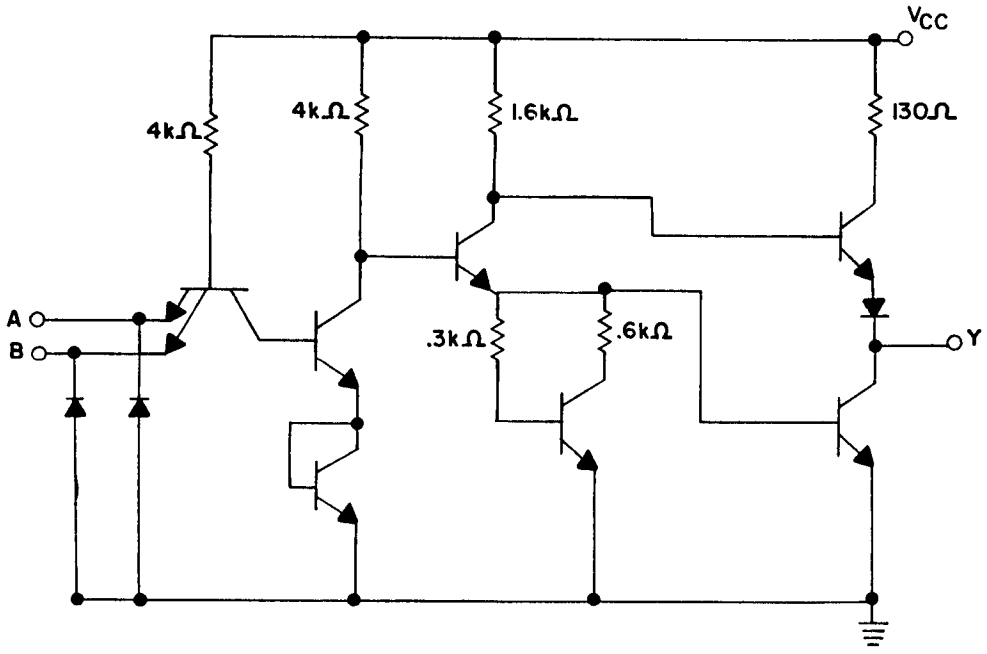
Positive logic Y = AB

FIGURE 2. Truth table and logic equations.



Component values shown are nominal.

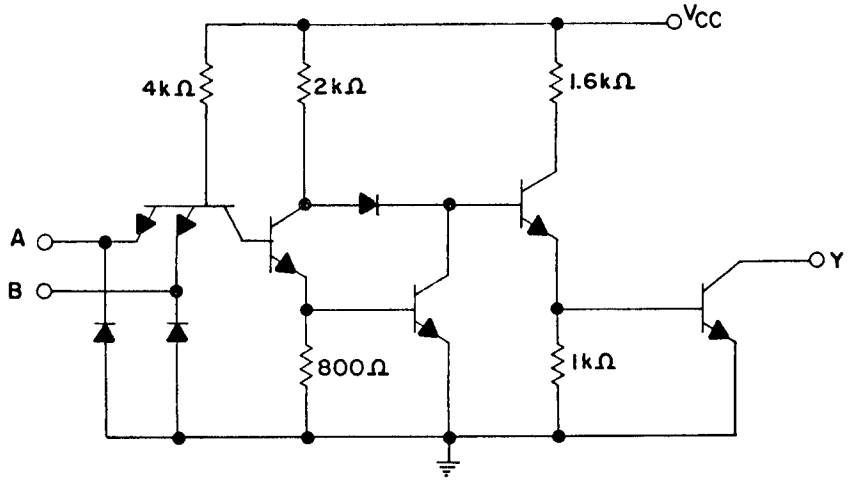
SCHEMATIC A



Component values shown are nominal.

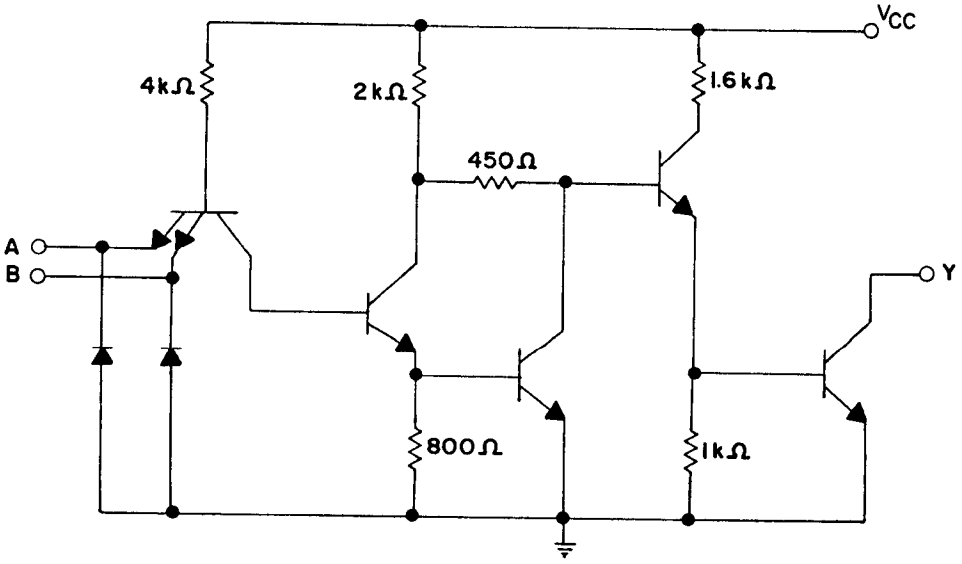
SCHEMATIC B

FIGURE 3. Schematic circuits for device type 01.



Component values shown are nominal.

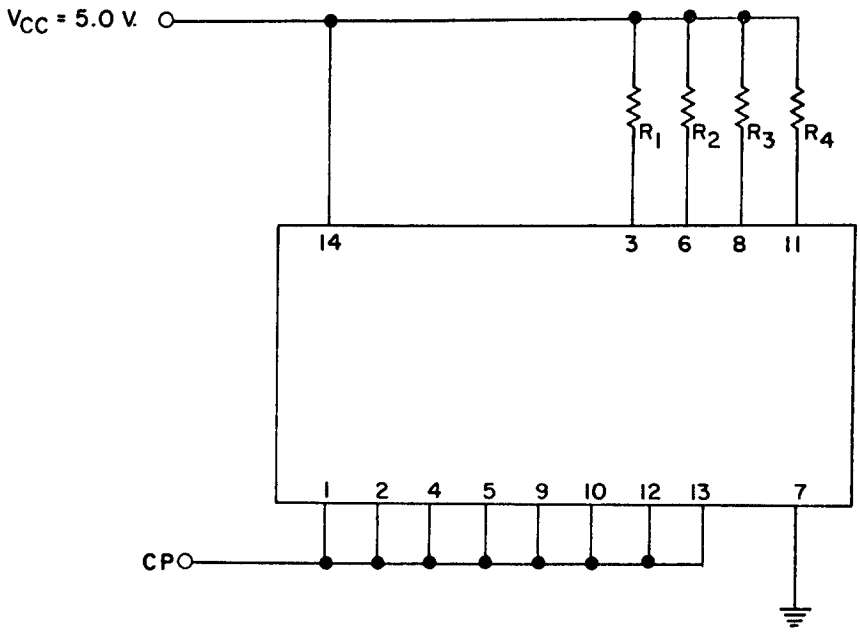
SCHEMATIC A



Component values shown are nominal.

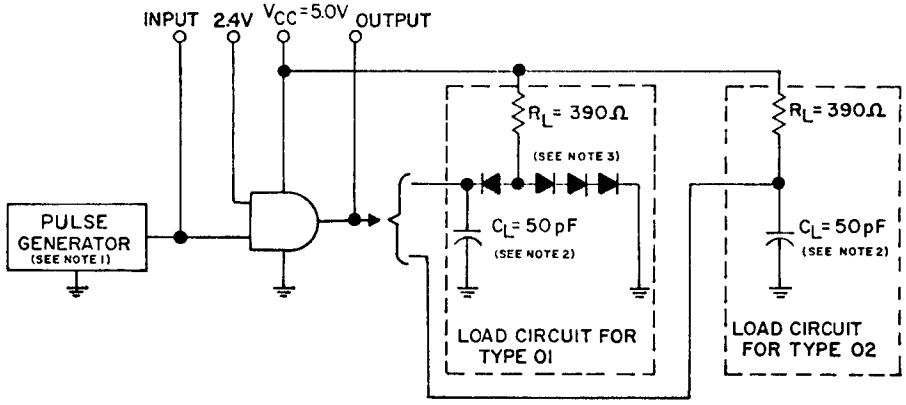
SCHEMATIC B

FIGURE 3. Schematic circuits for device type 02 - Continued.

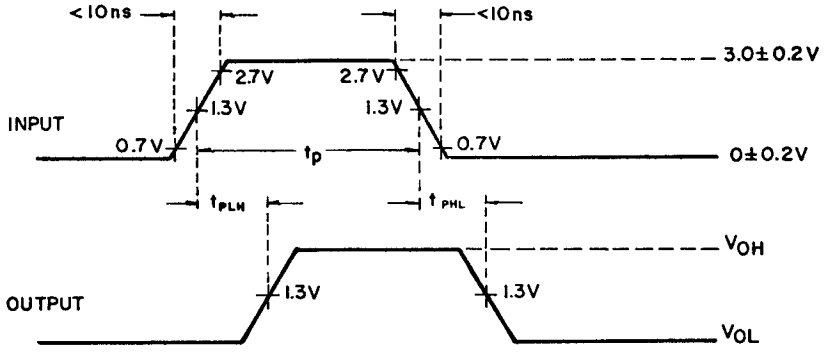


NOTES:
1. R_1 thru R_4 = 220 Ω ±5%.
2. The clock frequency shall be 100 kHz with V_{IN} = 3 V minimum and minimum duty cycle of 50%.

FIGURE 4. Burn-in and life test circuit.



TEST CIRCUIT



VOLTAGE WAVEFORMS.

NOTES:
1. The generator has the following characteristics: t_p = 0.5 μs, PRR = 1 MHz, $Z_{out} \approx 50\ \Omega$.
2. C_L includes probe and jig capacitance.
3. All diodes are 1N3064 or equivalent.

FIGURE 5. Switching time test circuit.

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

Subgroup	Symbol	MIL-STD-883 method	Case A, B, D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas. terminal	Test limits		
			Case C	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test No.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	VCC		Min	Max	Unit
1 T_A = 25 °C	V_{OL}	3007	1	0.8 V	5.5 V	16 mA	5.5 V	5.5 V		GND		5.5 V	5.5 V		5.5 V	5.5 V	4.5 V	1Y		.4	Vdc
			2	5.5 V	0.8 V	16 mA	5.5 V	5.5 V										1Y			
			3		5.5 V		0.8 V	5.5 V	16 mA									2Y			
			4				5.5 V	0.8 V	16 mA									2Y			
			5					5.5 V			16 mA	0.8 V						3Y			
			6								16 mA	5.5 V	0.8 V					3Y			
			7										5.5 V	16 mA	0.8 V			4Y			
			8											16 mA	5.5 V	0.8 V		4Y			
	V_{OH}	3006	9	2.0 V	2.0 V	-.8 mA									5.5 V	5.5 V		1Y	2.4		
			10	5.5 V	5.5 V		2.0 V	2.0 V	-.8 mA									2Y			
			11				5.5 V	5.5 V			-.8 mA	2.0 V	2.0 V					3Y			
			12				5.5 V	5.5 V				5.5 V	5.5 V	-.8 mA	2.0 V	2.0 V		4Y			
	I_{OS}	3011	13			GND											5.5 V	1Y	-20	-55	mA
			14				5.5 V	5.5 V	GND									2Y			
			15								GND	5.5 V	5.5 V					3Y			
			16											GND	5.5 V	5.5 V		4Y			
	I_{IH1}	3010	17	2.4 V	GND		GND	GND				GND	GND		GND	GND		1A		40	μA
			18	GND	2.4 V		GND											1B			
			19		GND		2.4 V											2A			
			20				GND	2.4 V										2B			
			21					GND				2.4 V						3A			
			22									GND	2.4 V					3B			
			23										GND		2.4 V			4A			
			24												GND	2.4 V		4B			
	I_{IH2}		25	5.5 V												GND		1A		100	
			26	GND	5.5 V													1B			
			27		GND		5.5 V											2A			
			28				GND	5.5 V										2B			
			29					GND				5.5 V						3A			
			30									GND	5.5 V					3B			
			31										GND		5.5 V			4A			
			32												GND	5.5 V		4B			
	I_{IL}	3009	33	0.4 V	5.5 V		5.5 V	5.5 V				5.5 V	5.5 V		5.5 V	5.5 V		1A	-.7	-1.6	mA
			34	5.5 V	0.4 V		5.5 V											1B			
			35		5.5 V		0.4 V											2A			
			36				5.5 V	0.4 V										2B			
			37				5.5 V	5.5 V				0.4 V						3A			
			38									5.5 V	0.4 V					3B			
			39										5.5 V		0.4 V			4A			
			40												5.5 V	0.4 V		4B			
	I_{CCH}	3005	41												5.5 V	5.5 V		V_{CC}		21	
	I_{CCL}	3005	42	GND	GND		GND	GND				GND	GND		GND	GND		V_{CC}		33	
	V_{IC}		43	-12 mA													4.5 V	1A		-1.5	Vdc
			44		-12 mA													1B			
			45				-12 mA											2A			
			46					-12 mA										2B			
			47									-12 mA						3A			
			48										-12 mA					3B			
			49												-12 mA			4A			
			50													-12 mA		4B			
2	Same tests, terminal conditions and limits as subgroup 1, except T_A = 125 °C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions and limits as subgroup 1, except T_A = -55 °C and V_{IC} tests are omitted.																				

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

Subgroup	Symbol	MIL-STD-883 method	Case A, B, D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas. terminal	Test limits		
			Case C	1	2	3	4	5	6	7	8	9	10	11	12	13	14		Min	Max	Unit
			Test No.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}				
9 T_A = 25 °C	t_{PHL}	3003 (Fig 5)	51 52 53 54	IN	2.4 V	OUT	IN	2.4 V	OUT	GND	OUT	IN	2.4 V	OUT	IN	2.4 V	5.0 V	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	3	25	ns
	t_{PLH}		55 56 57 58	IN	2.4 V	OUT	IN	2.4 V	OUT		OUT	IN	2.4 V	OUT	IN	2.4 V		1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y		31	
10 T_A = 125 °C	t_{PHL}		59 60 61 62	IN	2.4 V	OUT	IN	2.4 V	OUT		OUT	IN	2.4 V	OUT	IN	2.4 V		1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y		32	
	t_{PLH}		63 64 65 66	IN	2.4 V	OUT	IN	2.4 V	OUT		OUT	IN	2.4 V	OUT	IN	2.4 V		1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y		40	
11 T_A = -55 °C	t_{PHL}		67 68 69 70	IN	2.4 V	OUT	IN	2.4 V	OUT		OUT	IN	2.4 V	OUT	IN	2.4 V		1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y		32	
	t_{PLH}		71 72 73 74	IN	2.4 V	OUT	IN	2.4 V	OUT		OUT	IN	2.4 V	OUT	IN	2.4 V		1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y		40	

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

Subgroup	Symbol	MIL-STD-883 method	Case A, B, D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas. terminal	Test limits		
			Case C	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test No.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}		Min	Max	Unit
1 T_A = 25°C	V_{OL}	3007	1	0.8 V	5.5 V	16 mA	5.5 V	5.5 V		GND		5.5 V	5.5 V		5.5 V	5.5 V	4.5 V	1Y		.4	Vdc
			2	5.5 V	0.8 V	16 mA	5.5 V											1Y			
			3		5.5 V		0.8 V		16 mA									2Y			
			4				5.5 V	0.8 V	16 mA									2Y			
			5					5.5 V			16 mA	0.8 V						3Y			
			6								16 mA	5.5 V	0.8 V					3Y			
			7										5.5 V	16 mA	0.8 V			4Y			
			8											16 mA	5.5 V	0.8 V		4Y			
	I_{CEX}		9	2.0 V	2.0 V	5.5 V										5.5 V		1Y		250	µA
			10	5.5 V	5.5 V		2.0 V	2.0 V	5.5 V									2Y			
			11				5.5 V	5.5 V			5.5 V	2.0 V	2.0 V					3Y			
			12				5.5 V	5.5 V				5.5 V	5.5 V	5.5 V	2.0 V	2.0 V		4Y			
	I_{IH1}	3010	13	2.4 V	GND		GND	GND				GND	GND		GND	GND	5.5 V	1A		40	
			14	GND	2.4 V		GND											1B			
			15		GND		2.4 V											2A			
			16				GND	2.4 V										2B			
			17					GND				2.4 V						3A			
			18									GND	2.4 V					3B			
			19										GND		2.4 V			4A			
			20												GND	2.4 V		4B			
	I_{IH2}		21	5.5 V												GND		1A		100	
			22	GND	5.5 V													1B			
			23		GND		5.5 V											2A			
			24				GND	5.5 V										2B			
			25					GND				5.5 V						3A			
			26									GND	5.5 V					3B			
			27										GND		5.5 V			4A			
			28										GND		GND	5.5 V		4B			
	I_{IL}	3009	29	0.4 V	5.5 V		5.5 V	5.5 V				5.5 V	5.5 V		5.5 V	5.5 V		1A	-.7	-1.6	mA
			30	5.5 V	0.4 V		5.5 V											1B			
			31		5.5 V		0.4 V											2A			
			32				5.5 V	0.4 V										2B			
			33					5.5 V				0.4 V						3A			
			34									5.5 V	0.4 V					3B			
			35										5.5 V		0.4 V			4A			
			36										5.5 V		5.5 V	0.4 V		4B			
	I_{CCL}	3005	37	GND	GND		GND	GND				GND	GND		GND	GND		V_{CC}		33	
	I_{CCH}		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		V_{CC}		21	
	V_{IC}		39	-12 mA													4.5 V	1A		-1.5	Vdc
			40		-12 mA													1B			
			41				-12 mA											2A			
			42					-12 mA										2B			
			43									-12 mA						3A			
			44										-12 mA					3B			
			45												-12 mA			4A			
			46													-12 mA		4B			
2	Same tests, terminal conditions and limits as subgroup 1, except T_A = 125°C and V_{IC} tests are omitted.																				
3	Same tests, terminal conditions and limits as subgroup 1, except T_A = -55°C and V_{IC} tests are omitted.																				

TABLE III. Group A inspection for device type 02. - Continued

Terminal conditions (pins not designated are open)

Subgroup	Symbol	MIL-STD-883 method	Case A, B, D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Meas. terminal	Test limits		
			Case C	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
			Test No.	1A	1B	1Y	2A	2B	2Y	GND	3Y	3A	3B	4Y	4A	4B	V_{CC}		Min	Max	Unit
9 $T_A = 25°C$	t_{PHL}	3003 (Fig 5)	47	IN	2.4 V	OUT				GND							5.0 V	1A to 1Y	3	33	ns
			48				IN	2.4 V	OUT									2A to 2Y			
			49								OUT	IN	2.4 V					3A to 3Y			
			50											OUT	IN	2.4 V		4A to 4Y		↓	
	t_{PLH}		51	IN	2.4 V	OUT												1A to 1Y		39	
			52				IN	2.4 V	OUT									2A to 2Y			
			53								OUT	IN	2.4 V					3A to 3Y			
			54											OUT	IN	2.4 V		4A to 4Y		↓	
10 $T_A = 125°C$	t_{PHL}		55	IN	2.4 V	OUT												1A to 1Y		38	
			56				IN	2.4 V	OUT									2A to 2Y			
			57								OUT	IN	2.4 V					3A to 3Y			
			58											OUT	IN	2.4 V		4A to 4Y		↓	
	t_{PLH}		59	IN	2.4 V	OUT												1A to 1Y		49	
			60				IN	2.4 V	OUT									2A to 2Y			
			61								OUT	IN	2.4 V					3A to 3Y			
			62											OUT	IN	2.4 V		4A to 4Y		↓	
11 $T_A = -55°C$	t_{PHL}		63	IN	2.4 V	OUT												1A to 1Y		38	
			64				IN	2.4 V	OUT									2A to 2Y			
			65								OUT	IN	2.4 V					3A to 3Y			
			66											OUT	IN	2.4 V		4A to 4Y		↓	
	t_{PLH}		67	IN	2.4 V	OUT												1A to 1Y		49	
			68				IN	2.4 V	OUT									2A to 2Y			
			69								OUT	IN	2.4 V					3A to 3Y			
			70							↓				OUT	IN	2.4 V	↓	4A to 4Y	↓	↓	↓

5. PREPARATION FOR DELIVERY

5.1 Preservation-packaging and packing. Microcircuits shall be prepared for delivery in accordance with MIL-M-38510.

6. NOTES

6.1 Notes. The notes specified in MIL-M-38510 are applicable to this specification.

6.2 Intended use. Microcircuits conforming to this specification are intended for use for Government microcircuit applications (original equipment) and logistic purposes.

6.3 Ordering data. The contract or order 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) Requirement for certificate of compliance, if applicable.
(d) Requirements for notification of change of product or process to procuring activity in addition to notification to the qualifying activity, if applicable.
(e) Requirements for packaging and packing.
(f) Requirements for failure analysis (including required test condition of Method 5003), corrective action and reporting of results, if applicable.
(g) Requirements for product assurance options.
(h) Requirements for carrier, special lead lengths or lead forming, if applicable. These requirements shall not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.

6.4 Abbreviations, symbols and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-STD-1313, MIL-STD-1331, and as follows:

GND	Electrical ground (common terminal)
V_{IN}	Voltage level at an input terminal
V_{IC}	Input clamp voltage
I_{IN}	Current flowing into an input terminal

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

6.6 Substitutability. Microcircuits covered by this specification are substitutable for the following commercial device types.

Device type	Commercial type
01	5408
02	5409

Custodian:
Air Force - 17

Review activities:
Air Force - 11, 17, 80
DSA - ES
NASA - NA

User activity:
Air Force - 19

Preparing activity:
Air Force - 17

Agent:
DSA - ES

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