

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, DTL, NAND BUFFER/EXTENDER, 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, DTL, NAND buffer/extender microcircuits. One product assurance class and a choice of case outlines and lead finishes are provided 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 follows:

Device type	Circuit
01	Expandable, dual, 4-input NAND buffer
02	Expandable, dual, 4-input NAND buffer (open collector)
03	Quad, 2-input NAND buffer
04	Quad, 2-input NAND buffer (open collector)
05	Dual, 4-input extender

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, 3/16" x 1/4"), 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 +8.0 V dc
Input voltage range- - - - -	-1.5 V dc to +5.5 V dc
Storage temperature range- - - - -	-65°C to +150°C
Maximum power dissipation, per gate (P_D) ^{1/} :	
Device type 01 - - - - -	67 mW dc
Device type 02 - - - - -	50 mW dc
Device type 03 - - - - -	33 mW dc
Device type 04 - - - - -	43 mW dc
Lead temperature (soldering, 10 seconds) - - -	+300°C
Thermal resistance, junction-to-case (θ_{JC}):	
Cases A, B, and D- - - - -	0.09°C/mW
Case C - - - - -	0.08°C/mW
Junction temperature (T_J)- - - - -	+175°C

^{1/} Must withstand the added P_D due to short circuit test (e.g., I_{OS}).

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 range (V_{CC}) - - - - -	+4.5 V dc minimum to +5.5 V dc maximum
Minimum high-level input voltage (V_{IH}) -	+1.9 V dc @ +25°C
Maximum low-level input voltage (V_{IL}) -	+1.1 V dc @ +25°C
Normalized fanout (each output) $\frac{2}{1}$:	
Device types 01, 02, and 03 - - - - -	25 maximum
Device type 04 - - - - -	27 maximum
Device type 05 - - - - -	20 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 Logic diagrams and terminal connections. The logic diagrams 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 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 (see 6.5).

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. At the option of the manufacturer, marking of the country of origin may be omitted from the body of the microcircuit, but shall be retained on the initial container. The "JAN" or "J" certification mark shall not be used.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions <u>1/</u>	Device	Limits		Unit
				Min	Max	
High-level output voltage	V_{OH}	$V_{CC} = +4.5 \text{ V}$	01, 03	3.3		V
Low-level output voltage	V_{OL}	$V_{CC} = +4.5 \text{ V}$ $I_{OL} = +36 \text{ mA}$	01, 02, 03, 04		0.45	V
High-level input current	I_{IH1}	$V_{CC} = +5.5 \text{ V}$	All		5.0	μA
	I_{IH2}		05		10	μA
Low-level input current	I_{IL}	$V_{CC} = +5.5 \text{ V}$	01, 02, 03, 04		-1.50	mA
Output transistor leakage current	I_{CEX}	$V_{CC} = +4.5 \text{ V}$	01, 02, 03, 04		50	μA
Short circuit output current	I_{OS}	$V_{CC} = +5.5 \text{ V}$ $V_{IN} = \text{GND } \underline{2/}$	01 03	16		mA
High-level supply current per gate	I_{CCH1}	$V_{CC} = +5.0 \text{ V}$ $V_{IN} = \text{GND}$	01, 02, 03, 04		1.47	mA
High-level supply current per gate	I_{CCH2}	$V_{CC} = +8.0 \text{ V}$ $V_{IN} = \text{GND}$	01, 02, 03, 04		3.0	mA
Low-level supply current per gate	I_{CCL}	$V_{CC} = +5.0 \text{ V}$ $V_{IN} = \text{OPEN}$	01, 03		13.3	mA
			02, 04		10.0	mA
Propagation delay time high-to-low level	t_{PHL}	$V_{CC} = +5.0 \text{ V}$ $R_L = 150\Omega, C_L = 500 \text{ pF}$	01, 03	15	80	ns
			02, 04	10	45	ns
Propagation delay time low-to-high level	t_{PLH}	$V_{CC} = +5.0 \text{ V}$ $R_L = 510\Omega, C_L = 500 \text{ pF}$	01, 03	25	140	ns
			02, 04	15	120	ns
Forward voltage drop	V_F	$I_F = 2 \text{ mA}$	05	0.5	0.98	V

1/ Complete terminal conditions shall be as specified in table III.

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

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	Subgroups (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
Groups C and D 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.

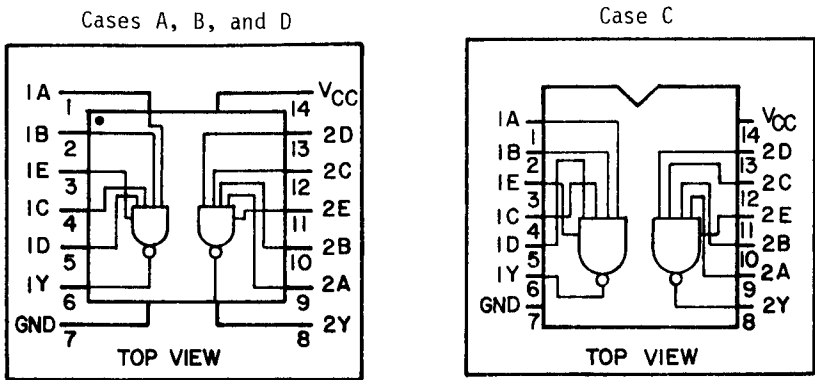
4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

- a. Burn-in test (method 1015 of MIL-STD-883).
 - (1) Test condition D or E, using the circuit shown on figure 3, or equivalent.
 - (2) $T_A = +125^{\circ}\text{C}$ 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.

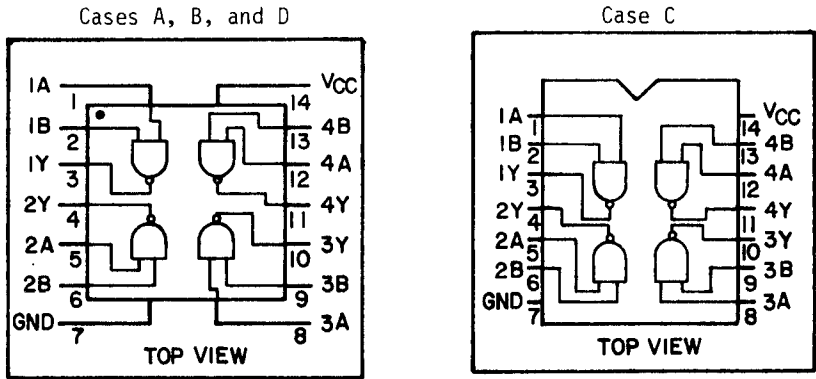
4.3 Qualification inspection. Qualification inspection is not required.

4.4 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-M-38510, and as specified herein. 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 6.6) 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.

Device types 01 and 02



Device type 03 and 04



Device type 05

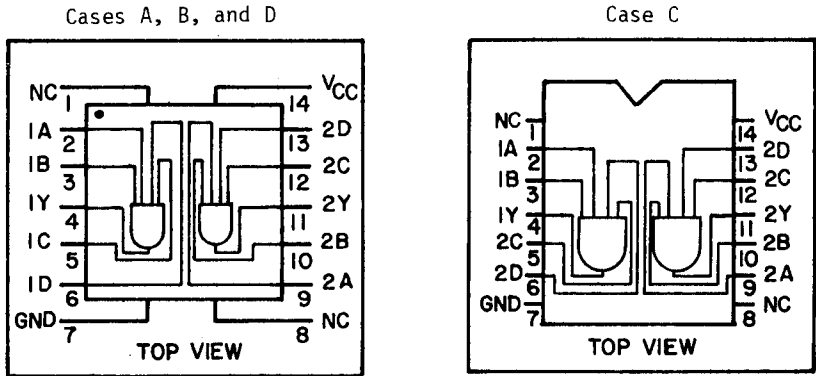


FIGURE 1. Logic diagram and terminal connections.

Device type 01 and 02

Truth table each gate					
Inputs					Output
A	B	C	D	X	Y
1	1	1	1	1	0
0	1	1	1	1	1
1	0	1	1	1	1
1	1	0	1	1	1
1	1	1	0	1	1
1	1	1	1	0	1
0	0	0	0	0	1

Positive logic:
 $Y = \overline{A \cdot B \cdot C \cdot D \cdot X}$

Device type 03 and 04

Truth table each gate		
Inputs		Output
A	B	Y
0	0	1
1	0	1
0	1	1
1	1	0

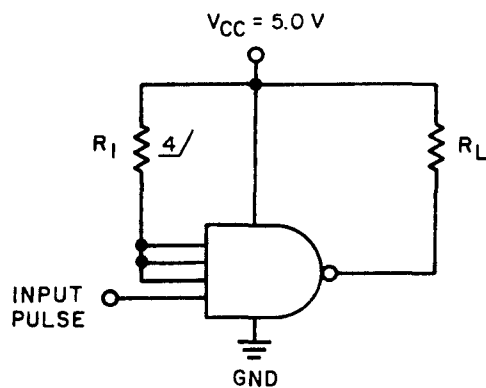
Positive logic:
 $Y = \overline{A \cdot B}$

Device type 05

Truth table each gate		
Inputs		Output
A	B	Y
0	0	0
1	0	0
0	1	0
1	1	1

Positive logic:
 $Y = A \cdot B$

FIGURE 2. Truth tables.

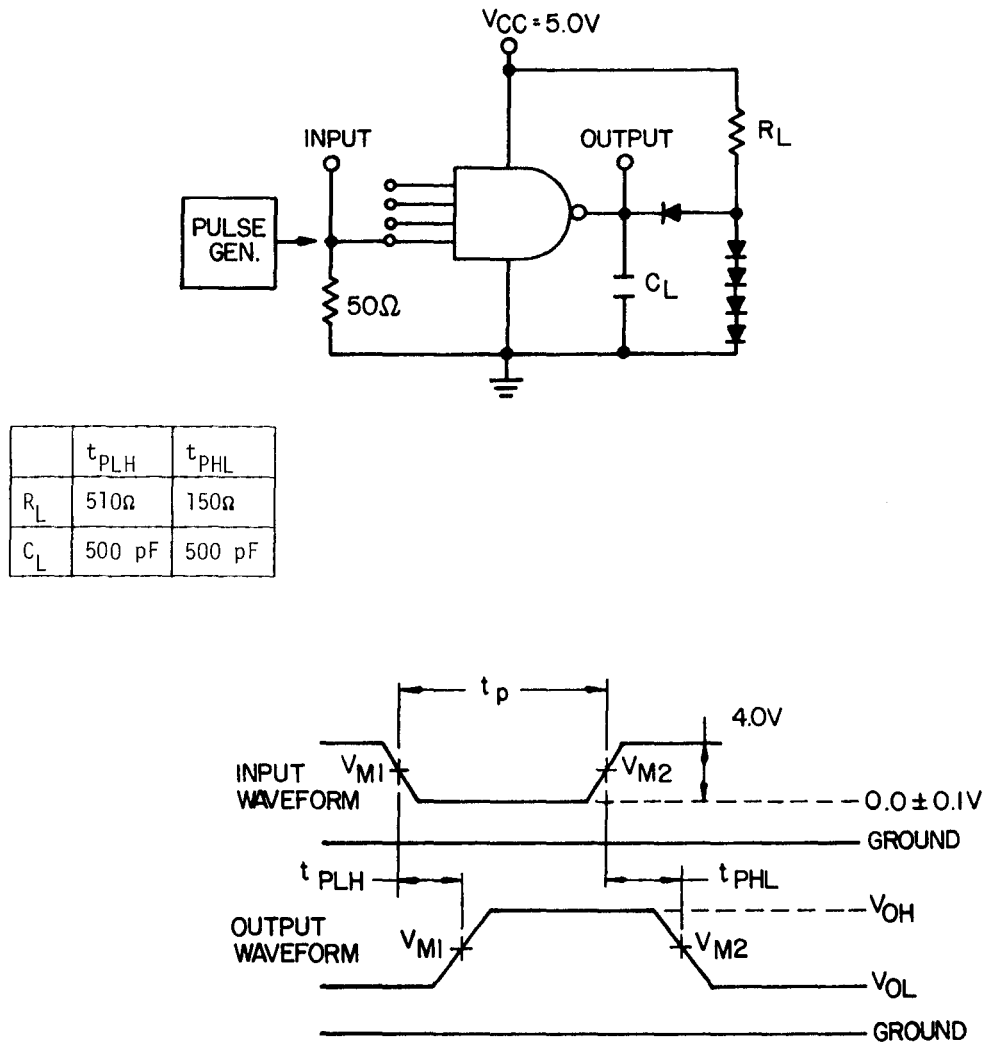


DEVICE TYPE	R_L
01,02 03,04	150 Ω $\pm 5\%$
05	4 k Ω $\pm 5\%$

NOTES:

1. The input pulse characteristics are: $V_{\text{gen}} = 4.0\text{ V}$, PRR = 100 kHz, duty cycle = 50%, $t_{\text{TLH}} = 100\text{ ns}$, and $t_{\text{THL}} = 100\text{ ns}$.
2. All input adjustments are 5%.
3. For parallel excitation: Clock pulse shall be 1 MHz and undriven inputs shall be connected to V_{CC} through appropriate current limiting resistor.
4. All undriven inputs are connected to V_{CC} through appropriate current limiting resistor.

FIGURE 3. Burn-in and life test circuit.



NOTES:

1. The generator has the following characteristics: $V_{gen} = 4.0 V$, $t_{TLH} = 10 ns$, $t_{THL} = 10 ns$, $PRR = 1.0 MHz$, $t_p = 110 ns \pm 10 ns$.
2. All input adjustments are $\pm 5\%$.
3. C_L includes all jig and probe capacitance.
4. All diodes are 1N4150 or equivalent.
5. Device types 02 and 04 shall use a 2 kΩ pull up resistor.

TEMP (°C)	V_{M1} (volts)	V_{M2} (volts)
25	1.5	1.5
125	1.2	1.2
-55	1.7	1.7

FIGURE 4. Switching time test circuit.

TABLE III. Group A inspection for device type 01. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1E	1C	1D	1Y	GND	2Y	2A	2B	2E	2C	2D	V _{CC}		Min	Max	
1 T _C = +25°C	V _{OL}	3007 3007	1 2	1.9 V	1.9 V		1.9 V	1.9 V	36 mA	GND "	36 mA	1.9 V	1.9 V		1.9 V	1.9 V	4.5 V "	1Y 2Y		0.4 0.4	V "
	V _{OH}	3006 " " " " "	3 4 5 6 7 8 9 10	1.1 V	1.1 V		1.1 V	1.1 V	-2.5 mA " "	" " "	-2.5 mA	1.1 V	1.1 V		1.1 V	1.1 V	" " " " " "	1Y 1Y 1Y 1Y 2Y 2Y 2Y	3,4 " " " " "	" " " " " "	" " " " " "
	V _{OH(E)}	" "	11 12			1.8 V			-2.5 mA	" "	-2.5 mA			1.8 V			" "	1Y 2Y	" "	" "	" "
	I _{OS}	3011 3011	13 14	GND					GND	" "	GND	GND					5.5 V "	1Y 2Y	-18 -18		mA mA
	I _{IH1}	3010 " " " " " "	15 16 17 18 19 20 21 22	4.0 V GND " " "	GND 4.0 V GND GND		GND GND 4.0 V GND	GND " " 4.0 V	" " " "	" " " "							" " " " " "	1A 1B 1C 1D 2A 2B 2C 2D	0 " " " " "	2.0 " " " " "	μA " " " " "
	I _{IL}	3009 " " " " " "	23 24 25 26 27 28 29 30	0.4 V 4.0 V " " "	4.0 V 0.4 V 4.0 V 4.0 V		4.0 V 4.0 V 0.4 V 4.0 V	4.0 V " " 0.4 V	" " " "	" " " "							" " " " " "	1A 1B 1C 1D 2A 2B 2C 2D	-0.6 " " " " "	-1.50 " " " " "	mA " " " " "
	I _{CEX}		31 32	1.1 V					4.5 V	" "	4.5 V	1.1 V					4.5 V 4.5 V	1Y 2Y		50 50	μA μA
	I _{CCL}	3005	33							"							5.0 V	V _{CC}		26.6	mA
	I _{CCH1}	"	34	GND						"		GND					5.0 V	V _{CC}		2.94	"
	I _{CCH2}	"	35	GND						"		GND					8.0 V	V _{CC}		6.0	"

TABLE III. Group A inspection for device type 01 - Continued. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1 1A	2 1B	3 1E	4 1C	5 1D	6 1Y	7 GND	8 2Y	9 2A	10 2B	11 2E	12 2C	13 2D	14 VCC	Measured terminal	Limits Min Max		Unit
T _C = +125°C	V _{OL}	3007 3007	36 37	1.7 V	1.7 V		1.7 V	1.7 V	36 mA	GND	36 mA	1.7 V	1.7 V		1.7 V	1.7 V	4.5 V	1Y 2Y		0.45 0.45	V
	V _{OH}	3006 " " " " " "	38 39 40 41 42 43 44 45	0.8 V	0.8 V		0.8 V	0.8 V	-4 mA " " " " " "	" " " " " " "	-4 mA " "	0.8 V	0.8 V		0.8 V	0.8 V	" " " " " " "	1Y 1Y 1Y 1Y 2Y 2Y 2Y 2Y	3.3 " " " " " "		" " " " " " "
	V _{OH(E)}	" "	46 47			1.3 V			-4 mA	"	-4 mA			1.3 V			"	1Y 2Y	" "		"
	I _{OS}	3011 3011	48 49	GND					GND	"	GND	GND					5.5 V	1Y 2Y	-16 -16		mA mA
	I _{IH1}	3010 " " " " " "	50 51 52 53 54 55 56 57	4.0 V GND " "	GND 4.0 V GND GND		GND GND 4.0 V GND	GND " " 4.0 V	" " " "	" " " "		4.0 V GND "	GND 4.0 V GND GND		GND GND 4.0 V GND	GND " 4.0 V	" " " " " " "	1A 1B 1C 1D 2A 2B 2C 2D		5.0 " " " " " "	μA " " " " " "
	I _{IL}	3009 " " " " " "	58 59 60 61 62 63 64 65	0.4 V 4.0 V " "	4.0 V 0.4 V 4.0 V 4.0 V		4.0 V 4.0 V 0.4 V 4.0 V	4.0 V " " 0.4 V	" " " "	" " " "		0.4 V 4.0 V " "	4.0 V 0.4 V 4.0 V 4.0 V		4.0 V 4.0 V 0.4 V 4.0 V	4.0 V " " "	" " " " " " "	1A 1B 1C 1D 2A 2B 2C 2D	-1.60 " " " " " "	-1.50 " " " " " "	mA " " " " " "
	I _{CEX}		66 67	0.8 V					4.5 V	"	4.5 V	0.8 V					4.5 V 4.5 V	1Y 2Y		50 50	μA μA
	I _{CCL}	3005	68							"							5.0 V	V _{CC}		26.6	mA
	I _{CCH1}	"	69	GND						"		GND					5.0 V	V _{CC}		2.94	"
	I _{CCH2}	"	70	GND						"		GND					8.0 V	V _{CC}		6.0	"

TABLE III. Group A inspection for device type 01 - Continued. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1E	1C	1D	1Y	GND	2Y	2A	2B	2E	2C	2D	V _{CC}		Min	Max	
T _C = -55°C	V _{OL}	3007 3007	71 72	2.1 V	2.1 V		2.1 V	2.1 V	36 mA	GND	36 mA	2.1 V	2.1 V		2.1 V	2.1 V	4.5 V	1Y 2Y		0.40 0.40	V
	V _{OH}	3006 " " " " " "	73 74 75 76 77 78 79 80	1.4 V	1.4 V		1.4 V	1.4 V	-2 mA	" " " " " " "		1.4 V	1.4 V		1.4 V	1.4 V	" " " " " " "	1Y 1Y 1Y 2Y 2Y 2Y 2Y	3.3 " " " " " "		" " " " " " "
	V _{OH} (E)	" "	81 82			2.1 V			-2 mA	"	-2 mA			2.1 V			"	1Y 2Y	" "		" "
	I _{OS}	3011 3011	83 84	GND					GND	"	GND	GND					5.5 V	1Y 2Y	-16 -16		mA mA
	I _{IH1}	3010 " " " " " "	85 86 87 88 89 90 91 92	4.0 V GND " " " " "	GND 4.0 V GND GND		GND GND 4.0 V GND	GND " " 4.0 V	" " " " " " "			4.0 V GND "	GND 4.0 V GND GND		GND GND 4.0 V GND	GND " " 4.0 V	" " " " " " "	1A 1B 1C 1D 2A 2B 2C 2D		2.0 " " " " " "	μA " " " " " "
	I _{IL}	3009 " " " " " "	93 94 95 96 97 98 99 100	0.4 V 4.0 V " " " " "	4.0 V 0.4 V 4.0 V 4.0 V		4.0 V 4.0 V 0.4 V 4.0 V	4.0 V " " 0.4 V	" " " " " " "			0.4 V 4.0 V " "	4.0 V 0.4 V 4.0 V 4.0 V		4.0 V 4.0 V 0.4 V 4.0 V	4.0 V " " 0.4 V	" " " " " " "	1A 1B 1C 1D 2A 2B 2C 2D	-0.6 " " " " " "	-1.50 " " " " " "	mA " " " " " "
	I _{CEX}		101 102	1.4 V					4.5 V	"	4.5 V	1.4 V					4.5 V 4.5 V	1Y 2Y		50 50	μA μA
	I _{CCL}	3005	103							"							5.0 V	V _{CC}		26.6	mA
	I _{CCH1}	"	104	GND						"		GND					5.0 V	V _{CC}		2.94	"
	I _{CCH2}	"	105	GND						"		GND					8.0 V	V _{CC}		6.0	"

TABLE III. Group A inspection for device type 01 - Continued 1/.

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1E	1C	1D	1Y	GND	2Y	2A	2B	2E	2C	2D	VCC		Min	Max	
$T_C = +25^\circ\text{C}$	tPHL	3003 Fig. 4	106 107	IN					OUT	GND "	OUT	IN					5.0 V "	1A to 1Y 2A to 2Y	15 15	40 40	ns "
	tPLH	"	108 109	IN					OUT	" "	OUT	IN					" "	1A to 1Y 2A to 2Y	25 25	80 80	" "
$T_C = +125^\circ\text{C}$	tPHL	"	110 111	IN					OUT	" "	OUT	IN					" "	1A to 1Y 2A to 2Y	15 15	50 50	" "
	tPLH	"	112 113	IN					OUT	" "	OUT	IN					" "	1A to 1Y 2A to 2Y	45 45	140 140	" "
$T_C = -55^\circ\text{C}$	tPHL	"	114 115	IN					OUT	" "	OUT	IN					" "	1A to 1Y 2A to 2Y	20 20	50 50	" "
	tPLH	"	116 117	IN					OUT	" "	OUT	IN					" "	1A to 1Y 2A to 2Y	25 25	72 72	" "

1/ Pins not designated may be HIGH level logic, LOW level logic, or open.

TABLE III. Group A inspection for device type 02. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1E	1C	1D	1Y	GND	2Y	2A	2B	2E	2C	2D	V _{CC}		Min	Max	
T _C = +25°C	V _{OL}	3007 3007	1 2	1.9 V	1.9 V		1.9 V	1.9 V	36 mA	GND	36 mA	1.9 V	1.9 V		1.9 V	1.9 V	4.5 V	1Y 2Y		0.4 0.4	V
	I _{IH1}	3010	3	4.0 V	GND		GND	GND		"							"	1A		2.0	μA
		"	4	GND	4.0 V		GND	"		"							"	1B		"	"
		"	5	"	GND		4.0 V	"		"							"	1C		"	"
		"	6	"	GND		GND	4.0 V		"							"	1D		"	"
		"	7							"		4.0 V	GND		GND	GND	"	2A		"	"
		"	8							"		GND	4.0 V		GND	"	"	2B		"	"
		"	9							"		"	GND		4.0 V	4.0 V	"	2C		"	"
		"	10							"		"	GND		GND	4.0 V	"	2D		"	"
	I _{IL}	3009	11	0.4 V	4.0 V		4.0 V	4.0 V		"							"	1A	-0.6	-1.50	mA
		"	12	4.0 V	0.4 V		4.0 V	"		"							"	1B	"	"	"
		"	13	"	4.0 V		0.4 V	"		"							"	1C	"	"	"
		"	14	"	4.0 V		4.0 V	0.4 V		"							"	1D	"	"	"
		"	15							"		0.4 V	4.0 V		4.0 V	4.0 V	"	2A	"	"	"
		"	16							"		4.0 V	0.4 V		4.0 V	"	"	2B	"	"	"
		"	17							"		"	4.0 V		0.4 V	"	"	2C	"	"	"
		"	18							"		"	4.0 V		4.0 V	0.4 V	"	2D	"	"	"
	I _{CEX}		19	1.1 V					4.5 V	"							4.5 V	1Y		50	μA
			20		1.1 V				"	"							"	1Y		"	"
			21						"	"							"	1Y		"	"
			22				1.1 V		"	"							"	2Y		"	"
			23					1.1 V		"							"	2Y		"	"
			24							"	4.5 V	1.1 V	1.1 V		1.1 V		"	2Y		"	"
			25							"	"						"	2Y		"	"
			26							"	"						"	2Y		"	"
			27			1.8 V				"				1.8 V			"	1Y		"	"
			28						4.5 V	"							"	2Y		"	"
	I _{CCL}	3005	29							"							5.0 V	V _{CC}		20	mA
	I _{CCH1}	"	30	GND						"		GND					5.0 V	V _{CC}		2.94	"
	I _{CCH2}	"	31	GND						"		GND					8.0 V	V _{CC}		6.0	"

See footnote at end of device type 02.

TABLE III. Group A inspection for device type 02 - Continued. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1E	1C	1D	1Y	GND	2Y	2A	2B	2E	2C	2D	VCC		Min	Max	
2 T _C = +125°C	V _{OL}	3007 3007	32 33	1.7 V	1.7 V		1.7 V	1.7 V	36 mA	GND "	36 mA	1.7 V	1.7 V		1.7 V	1.7 V	4.5 V 4.5 V	1Y 2Y		0.45 0.45	V V
	I _{IH1}	3010 " " " " " "	34 35 36 37 38 39 40 41	4.0 V GND " " " " "	GND 4.0 V GND GND		GND GND 4.0 V GND	GND " " 4.0 V		" " " " "		4.0 V GND " "	GND 4.0 V GND GND		GND GND 4.0 V GND	GND " " 4.0 V	5.5 V " " " " " "	1A 1B 1C 1D 2A 2B 2C 2D		5.0 " " " " " "	μA " " " " " "
	I _{IL}	3009 " " " " " "	42 43 44 45 46 47 48 49	0.4 V 4.0 V " " " " "	4.0 V 0.4 V 4.0 V 4.0 V		4.0 V 4.0 V 0.4 V 4.0 V	4.0 V " " 0.4 V		" " " " "		0.4 V 4.0 V " "	4.0 V 0.4 V 4.0 V 4.0 V		4.0 V 4.0 V 0.4 V 4.0 V	4.0 V " " 0.4 V	" " " " " " "	1A 1B 1C 1D 2A 2B 2C 2D	-0.6 " " " " " "	-1.50 " " " " " "	mA " " " " " "
	I _{CEX}		50 51 52 53 54 55 56 57 58 59	0.8 V	0.8 V		0.8 V	0.8 V	4.5 V " "	" " " " " " "	4.5 V " "	0.8 V	0.8 V		0.8 V	0.8 V	4.5 V " " " " " "	1Y 1Y 1Y 1Y 2Y 2Y 2Y 2Y 1Y 2Y		50 " " " " " "	μA " " " " " "
	I _{CCL}	3005	60							"							5.0 V	V _{CC}		20	mA
	I _{CCH1}	"	61	GND						"		GND					5.0 V	V _{CC}		2.94	"
	I _{CCH2}	"	62	GND						"		GND					8.0 V	V _{CC}		6.0	"

TABLE III. Group A inspection for device type 02 - Continued. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1E	1C	1D	1Y	GND	2Y	2A	2B	2E	2C	2D	V _{CC}		Min	Max	
3 T _C = -55°C	V _{OL}	3007 3007	63 64	2.1 V	2.1 V		2.1 V	2.1 V	36 mA	GND	36 mA	2.1 V	2.1 V		2.1 V	2.1 V	4.5 V 4.5 V	1Y 2Y		0.4 0.4	V V
	I _{IH1}	3010 " " " " " "	65 66 67 68 69 70 71 72	4.0 V GND " " " " "	GND 4.0 V GND GND		GND GND 4.0 V GND	GND " " 4.0 V		" " " " "							5.5 V " " " " " " "	1A 1B 1C 1D 2A 2B 2C 2D		2.0 " " " " " " "	μA
	I _{IL}	3009 " " " " " "	73 74 75 76 77 78 79 80	0.4 V 4.0 V " " " " "	4.0 V 0.4 V 4.0 V 4.0 V		4.0 V 4.0 V 0.4 V 4.0 V	4.0 V " " 0.4 V		" " " " "							" " " " " " " "	1A 1B 1C 1D 2A 2B 2C 2D	-0.6 " " " " " " "	-1.50 " " " " " " "	mA
	I _{CEX}		81 82 83 84 85 86 87 88 89 90	1.4 V	1.4 V		1.4 V	1.4 V	4.5 V " "	" " " " "		4.5 V " "	1.4 V				4.5 V " " " " " " "	1Y 1Y 1Y 1Y 2Y 2Y 2Y 1Y 2Y		50 " " " " " " "	μA
	I _{CCL}	3005	91							"							5.0 V	V _{CC}		20	mA
	I _{CCH1}	"	92	GND						"		GND					5.0 V	V _{CC}		2.94	"
	I _{CCH2}	"	93	GND						"		GND					8.0 V	V _{CC}		6.0	"

TABLE III. Group A inspection for device type 02 - Continued 1/.

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1E	1C	1D	1Y	GND	2Y	2A	2B	2E	2C	2D	VCC		Min	Max	
$T_C = +25^\circ\text{C}$	tPHL	3003 Fig. 4	94 95	IN					OUT	GND	OUT	IN					5.0 V	1A to 1Y 2A to 2Y	10 10	35 35	ns
	tPLH	"	96 97	IN					OUT	"	OUT	IN					"	1A to 1Y 2A to 2Y	15 15	50 50	"
$T_C = +125^\circ\text{C}$	tPHL	"	98 99	IN					OUT	"	OUT	IN					"	1A to 1Y 2A to 2Y	10 10	45 45	"
	tPLH	"	100 101	IN					OUT	"	OUT	IN					"	1A to 1Y 2A to 2Y	30 30	120 120	"
$T_C = -55^\circ\text{C}$	tPHL	"	102 103	IN					OUT	"	OUT	IN					"	1A to 1Y 2A to 2Y	15 15	45 45	"
	tPLH	"	104 105	IN					OUT	"	OUT	IN					"	1A to 1Y 2A to 2Y	10 10	35 35	"

1/ Pins not designated may be HIGH level logic, LOW level logic, or open.

TABLE III. Group A inspection for device type 03. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1Y	2Y	2A	2B	GND	3A	3B	3Y	4Y	4A	4B	V _{CC}		Min	Max	
T _C = +25°C	V _{OL}	3007 " "	1 2 3 4	1.9 V	1.9 V	36 mA	36 mA	1.9 V	1.9 V	GND " "	1.9 V	1.9 V	36 mA	36 mA	1.9 V	1.9 V	4.5 V " "	1Y 2Y 3Y 4Y		0.4 " "	V
	V _{OH}	3006 " " " " " "	5 6 7 8 9 10 11 12	1.1 V	1.1 V	-2.5 mA -2.5 mA	-2.5 mA -2.5 mA	1.1 V	1.1 V	" " " " " "	1.1 V	1.1 V	-2.5 mA -2.5 mA	-2.5 mA -2.5 mA	1.1 V	1.1 V	" " " " " "	1Y 1Y 2Y 2Y 3Y 3Y 4Y 4Y	3,4 " " " " " "	" " " " " "	V
	I _{OS}	3011 " "	13 14 15 16	GND		GND	GND	GND		" " "	GND		GND	GND	GND		5.5 V " "	1Y 2Y 3Y 4Y	-18 " "		mA
	I _{IH1}	3010 " " " " " "	17 18 19 20 21 22 23 24	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	" " " " " "	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	" " " " " "	1A 1B 2A 2B 3A 3B 4A 4B	0 " " " " " "	2.0 " " " " " "	μA
	I _{IL}	3009 " " " " " "	25 26 27 28 29 30 31 32	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	" " " " " "	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	" " " " " "	1A 1B 2A 2B 3A 3B 4A 4B	-0.6 " " " " " "	-1.50 " " " " " "	mA
	I _{CEX}		33 34 35 36	1.1 V		4.5 V	4.5 V	1.1 V		" " "	1.1 V		4.5 V	4.5 V	1.1 V		4.5 V " "	1Y 2Y 3Y 4Y	0 " "	50 " "	μA
	I _{CCL}	3005	37							"							5.0 V	V _{CC}		53.2	mA
	I _{CCH1}	"	38	GND				GND		"	GND				GND		5.0 V	V _{CC}		5.88	"
	I _{CCH2}	"	39	GND				GND		"	GND				GND		8.0 V	V _{CC}		12.0	"

TABLE III. Group A inspection for device type 03 - Continued. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1 1A	2 1B	3 1Y	4 2Y	5 2A	6 2B	7 GND	8 3A	9 3B	10 3Y	11 4Y	12 4A	13 4B	14 V _{CC}	Measured terminal	Limits Min Max		Unit
T _C = +125°C	V _{OL}	3007 " " "	40 41 42 43	1.7 V	1.7 V	36 mA	36 mA	1.7 V	1.7 V	GND " "	1.7 V	1.7 V	36 mA	36 mA	1.7 V	1.7 V	4.5 V " "	1Y 2Y 3Y 4Y		0.45 " "	V " "
	V _{OH}	3006 " " " " " "	44 45 46 47 48 49 50 51	0.8 V	0.8 V	-4 mA -4 mA	-4 mA -4 mA	0.8 V	0.8 V	" " " " " "	0.8 V	0.8 V	-4 mA -4 mA	-4 mA -4 mA	0.8 V	0.8 V	" " " " " "	1Y 1Y 2Y 2Y 3Y 3Y 4Y 4Y	3.3 " " " " "	" " " " " "	" " " " " "
	I _{OS}	3011 " "	52 53 54 55	GND		GND	GND	GND		" " "	GND		GND	GND	GND		5.5 V " "	1Y 2Y 3Y 4Y	16 " "	" " "	mA " "
	I _{IH1}	3010 " " " " " "	56 57 58 59 60 61 62 63	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	" " " " " "	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	" " " " " "	1A 1B 2A 2B 3A 3B 4A 4B	0 " " " " "	2.0 " " " " "	μA " " " " "
	I _{IL}	3009 " " " " " "	64 65 66 67 68 69 70 71	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	" " " " " "	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	" " " " " "	1A 1B 2A 2B 3A 3B 4A 4B	-0.6 " " " " "	-1.50 " " " " "	mA " " " " "
	I _{CEX}		72 73 74 75	0.8 V		4.5 V	4.5 V	0.8 V		" " "	0.8 V		4.5 V	4.5 V	0.8 V		4.5 V " "	1Y 2Y 3Y 4Y	0 " "	50 " "	μA " "
	I _{CCL}	3005	76							"							5.0 V	V _{CC}		5.32	mA
	I _{CCH1}	"	77	GND				GND		"	GND				GND		5.0 V	V _{CC}		5.88	"
	I _{CCH2}	"	78	GND				GND		"	GND				GND		8.0 V	V _{CC}		12.0	"

TABLE III. Group A inspection for device type 03 - Continued. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit	
				1A	1B	1Y	2Y	2A	2B	GND	3A	3B	3Y	4Y	4A	4B	VCC		Min	Max		
T _C = -55°C	V _{OL}	3007 " " "	79 80 81 82	2.1 V	2.1 V	36 mA	36 mA	2.1 V	2.1 V	GND " "	2.1 V	2.1 V	36 mA	36 mA	2.1 V	2.1 V	4.5 V " "	1Y 2Y 3Y 4Y		0.4 " "	V " "	
	V _{OH}	3006 " " " " " " "	83 84 85 86 87 88 89 90	1.4 V	1.4 V	-2 mA -2 mA	-2 mA -2 mA	1.4 V	1.4 V	" " " " " " "	1.4 V	1.4 V	-2 mA -2 mA	-2 mA -2 mA	1.4 V	1.4 V	" " " " " " "	1Y 1Y 2Y 2Y 3Y 3Y 4Y 4Y	3.3		" " " " " " "	
	I _{OS}	3011 " " "	91 92 93 94	GND		GND	GND	GND		" " "	GND		GND	GND	GND		5.5 V " "	1Y 2Y 3Y 4Y	16 " "		mA " "	
	I _{IH1}	3010 " " " " " " "	95 96 97 98 99 100 101 102	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	" " " " " " "	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	" " " " " " "	1A 1B 2A 2B 3A 3B 4A 4B	0 " "	2.0 " "	μA " "	
	I _{IL}	3009 " " " " " " "	103 104 105 106 107 108 109 110	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	" " " " " " "	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	" " " " " " "	1A 1B 2A 2B 3A 3B 4A 4B	-0.6 " "	-1.50 " "	mA " "	
	I _{CEX}		111 112 113 114	1.4 V		4.5 V	4.5 V	1.4 V		" " "	1.4 V		4.5 V	4.5 V	1.4 V		4.5 V " "	1Y 2Y 3Y 4Y	0 " "	50 " "	μA " "	
	I _{CCL}	3005	115							"							5.0 V	VCC		53.2	mA	
	I _{CCH1}	"	116	GND							"	GND				GND		5.0 V	VCC		5.88	"
	I _{CCH2}	"	117	GND							"	GND				GND		8.0 V	VCC		12.0	"

See footnote at end of table.

TABLE III. Group A inspection for device type 03 - Continued 1/.

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1Y	2Y	2A	2B	GND	3A	3B	3Y	4Y	4A	4B	VCC		Min	Max	
$T_C = +25^\circ\text{C}$	tPHL	3003 Fig. 4	118 119 120 121	IN		OUT	OUT	IN		GND " "	IN		OUT	OUT	IN		5.0 V " "	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	15 " " "	40 " " "	ns " " "
	tPLH	" " "	122 123 124 125	IN		OUT	OUT	IN		" " "	IN		OUT	OUT	IN		" " "	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	25 " " "	80 " " "	" " " "
$T_C = +125^\circ\text{C}$	tPHL	" " "	126 127 128 129	IN		OUT	OUT	IN		" " "	IN		OUT	OUT	IN		" " "	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	15 " " "	50 " " "	" " " "
	tPLH	" " "	130 131 132 133	IN		OUT	OUT	IN		" " "	IN		OUT	OUT	IN		" " "	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	45 " " "	140 " " "	" " " "
$T_C = -55^\circ\text{C}$	tPHL	" " "	134 135 136 137	IN		OUT	OUT	IN		" " "	IN		OUT	OUT	IN		" " "	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	20 " " "	50 " " "	" " " "
	tPLH	" " "	138 139 140 141	IN		OUT	OUT	IN		" " "	IN		OUT	OUT	IN		" " "	1A to 1Y 2A to 2Y 3A to 3B 4A to 4B	25 " " "	72 " " "	" " " "

1/ Pins not designated may be HIGH level logic, LOW level logic, or open.

TABLE III. Group A inspection for device type 04. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A,B,C,D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1Y	2Y	2A	2B	GND	3A	3B	3Y	4Y	4A	4B	V _{CC}		Min	Max	
1 T _C = +25°C	V _{OL}	3007	1 2 3 4	1.9 V	1.9 V	36 mA	36 mA	1.9 V	1.9 V	GND	1.9 V	1.9 V	36 mA	36 mA	1.9 V	1.9 V	4.5 V	1Y 2Y 3Y 4Y		0.4	V
	I _{IH1}	3010	5 6 7 8 9 10 11 12	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	"	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	5.5 V	1A 1B 2A 2B 3A 3B 4A 4B		2.0	μA
	I _{IL}	3009	13 14 15 16 17 18 19 20	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	"	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	"	1A 1B 2A 2B 3A 3B 4A 4B	-0.6	-1.50	mA
	I _{CEX}		21 22 23 24	1.1 V		4.5 V	4.5 V	1.1 V		"	1.1 V		4.5 V	4.5 V	1.1 V		4.5 V	1Y 2Y 3Y 4Y	0	50	μA
	I _{CCL}	3005	25							"							5.0 V	V _{CC}		40	mA
	I _{CCH1}	"	26	GND				GND		"	GND				GND		5.0 V	V _{CC}		5.88	"
	I _{CCH2}	"	27	GND				GND		"	GND				GND		8.0 V	V _{CC}		12.0	"

See footnote at end of table.

TABLE III. Group A inspection for device type 04 - Continued. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1Y	2Y	2A	2B	GND	3A	3B	3Y	4Y	4A	4B	V _{CC}		Min	Max	
T _C = +125°C	V _{OL}	3007	28 29 30 31	1.7 V	1.7 V	36 mA	36 mA	1.7 V	1.7 V	GND	1.7 V	1.7 V	36 mA	36 mA	1.7 V	1.7 V	4.5 V	1Y 2Y 3Y 4Y		0.45	V
	I _{IH1}	3010	32 33 34 35 36 37 38 39	4.0 V GND	GND 4.0 V			4.0 V GND	GND 4.0 V	"	4.0 V GND	GND 4.0 V					5.5 V	1A 1B 2A 2B 3A 3B 4A 4B		5.0	μA
	I _{IL}	3009	40 41 42 43 44 45 46 47	0.4 V 4.0 V	4.0 V 0.4 V			0.4 V 4.0 V	4.0 V 0.4 V	"	0.4 V 4.0 V	4.0 V 0.4 V					"	1A 1B 2A 2B 3A 3B 4A 4B	-0.6	-1.50	mA
	I _{CEX}		48 49 50 51	0.8 V		4.5 V	4.5 V	0.8 V		"	0.8 V		4.5 V	4.5 V	0.8 V		4.5 V	1Y 2Y 3Y 4Y	0	50	μA
	I _{CCL}	3005	52							"							5.0 V	V _{CC}		40	mA
	I _{CCH1}	"	53	GND				GND		"	GND				GND		5.0 V	V _{CC}		5.88	"
	I _{CCH2}	"	54	GND				GND		"	GND				GND		8.0 V	V _{CC}		12.0	"

TABLE III. Group A inspection for device type 04 - Continued. 1/

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1Y	2Y	2A	2B	GND	3A	3B	3Y	4Y	4A	4B	V _{CC}		Min	Max	
3 T _C = -55°C	V _{OL}	3007	55	2.1 V	2.1 V	36 mA				GND							4.5 V	1Y		0.4	V
		"	56				36 mA	2.1 V	2.1 V	"	2.1 V	2.1 V	36 mA				"	2Y		"	"
		"	57							"				36 mA			"	3Y		"	"
		"	58							"					2.1 V	2.1 V	"	4Y		"	"
	I _{IH1}	3010	59	4.0 V	GND					"							5.5 V	1A		2.0	μA
		"	60	GND	4.0 V					"							"	1B		"	"
		"	61					4.0 V	GND	"							"	2A		"	"
		"	62					GND	4.0 V	"							"	2B		"	"
		"	63							"	4.0 V	GND					"	3A		"	"
		"	64							"	GND	4.0 V					"	3B		"	"
		"	65							"					4.0 V	GND	"	4A		"	"
		"	66							"					GND	4.0 V	"	4B		"	"
	I _{IL}	3009	67	0.4 V	4.0 V					"							"	1A	-0.6	-1.50	mA
		"	68	4.0 V	0.4 V					"							"	1B	"	"	"
		"	69					0.4 V	4.0 V	"							"	2A	"	"	"
		"	70					4.0 V	0.4 V	"							"	2B	"	"	"
		"	71							"	0.4 V	4.0 V					"	3A	"	"	"
		"	72							"	4.0 V	0.4 V					"	3B	"	"	"
		"	73							"					0.4 V	4.0 V	"	4A	"	"	"
		"	74							"					4.0 V	0.4 V	"	4B	"	"	"
	I _{CEX}		75	1.4 V		4.5 V	4.5 V	1.4 V		"							4.5 V	1Y	0	50	μA
			76							"	1.4 V		4.5 V				"	2Y	"	"	"
			77							"				4.5 V	1.4 V		"	3Y	"	"	"
			78							"							"	4Y	"	"	"
	I _{CCL}	3005	79							"							5.0 V	V _{CC}		40	mA
	I _{CCH1}	"	80	GND				GND		"	GND				GND		5.0 V	V _{CC}		5.88	"
	I _{CCH2}	"	81	GND				GND		"	GND				GND		8.0 V	V _{CC}		12.0	"

See footnote at end of table.

TABLE III. Group A inspection for device type 04 - Continued 1/.

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Measured terminal	Limits		Unit
				1A	1B	1Y	2Y	2A	2B	GND	3A	3B	3Y	4Y	4A	4B	V _{CC}		Min	Max	
9 T _C = +25°C	tPHL	3003 Fig. 4	82 83 84 85	IN		OUT	OUT	IN		GND	IN		OUT	OUT	IN		5.0 V	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	10 " " " "	35 " " " "	ns
	tPLH	"	86 87 88 89	IN		OUT	OUT	IN		"	IN		OUT	OUT	IN		"	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	15 " " " "	50 " " " "	"
10 T _C = +125°C	tPHL	"	90 91 92 93	IN		OUT	OUT	IN		"	IN		OUT	OUT	IN		"	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	10 " " " "	45 " " " "	"
	tPLH	"	94 95 96 97	IN		OUT	OUT	IN		"	IN		OUT	OUT	IN		"	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	30 " " " "	120 " " " "	"
11 T _C = -55°C	tPHL	"	98 99 100 101	IN		OUT	OUT	IN		"	IN		OUT	OUT	IN		"	1A to 1Y 2A to 2Y 3A to 3Y 4A to 4Y	15 " " " "	45 " " " "	"
	tPLH	"	102 103 104 105	IN		OUT	OUT	IN		"	IN		OUT	OUT	IN		"	1A to 1Y 2A to 2Y 3A to 3B 4A to 4B	10 " " " "	35 " " " "	"

1/ Pins not designated may be HIGH level logic, LOW level logic, or open.

TABLE III. Group A inspection for device type 05 - Continued 1/.

Subgroup	Symbol	MIL-STD-883 method	Cases A, B, C, D Test no.	1 NC	2 1A	3 1B	4 1Y	5 1C	6 1D	7 GND	8 NC	9 2A	10 2B	11 2Y	12 2C	13 2D	14 VCC	Measured terminal	Limits		Unit
																			Min	Max	
$T_C = +25^\circ\text{C}$	V_F		1				2 mA			GND								1Y	70	82	V
			2		GND	GND	"	GND	GND	"								1Y	"	"	"
			3				"			"								1Y	"	"	"
			4				"			"								1Y	"	"	"
			5				"			"		GND	GND	2 mA				2Y	"	"	"
			6				"			"				"	GND	GND		2Y	"	"	"
$T_C = +25^\circ\text{C}$	I_{IH1}	3010	9		4.0 V	GND		GND	GND	"								1A		2.0	μA
			10		GND	4.0 V		GND	"	"								1B		"	"
			11		"	GND		4.0 V	"	"								1C		"	"
			12			GND		GND	"	"								1D		"	"
			13						4.0 V	"		4.0 V	GND		GND	GND		2A		"	"
			14							"		4.0 V	4.0 V		4.0 V	"		2B		"	"
$T_C = +25^\circ\text{C}$	I_{IH2}		17				4.0 V			"								1Y		10	"
			18				"			"				4.0 V				2Y		10	"
$T_C = +125^\circ\text{C}$	V_F		19		GND	GND	2 mA	GND	GND	"								1Y	0.5	.65	V
			20				"			"								1Y	"	"	"
			21				"			"								1Y	"	"	"
			22				"			"								1Y	"	"	"
			23				"			"		GND	GND	2 mA				2Y	"	"	"
			24				"			"				"	GND	GND		2Y	"	"	"
$T_C = +125^\circ\text{C}$	I_{IH1}	3010	27		4.0 V	GND		GND	GND	"								1A		5.0	μA
			28		GND	4.0 V		GND	"	"								1B		"	"
			29		"	GND		4.0 V	"	"								1C		"	"
			30			GND		GND	"	"								1D		"	"
			31						4.0 V	"		4.0 V	GND		GND	GND		2A		"	"
			32							"		GND	4.0 V		4.0 V	"		2B		"	"
$T_C = +125^\circ\text{C}$	I_{IH2}		35				4.0 V			"								1Y		10	"
			36				"			"				4.0 V				2Y		10	"
$T_C = -55^\circ\text{C}$	V_F		37		GND	GND	2 mA	GND	GND	"								1Y	0.85	10.98	V
			38				"			"								1Y	"	"	"
			39				"			"								1Y	"	"	"
			40				"			"								1Y	"	"	"
			41				"			"		GND	GND	2 mA				2Y	"	"	"
			42				"			"				"	GND	GND		2Y	"	"	"
$T_C = -55^\circ\text{C}$	I_{IH1}	3010	45		4.0 V	GND		GND	GND	"								1A		2.0	μA
			46		GND	4.0 V		GND	"	"								1B		"	"
			47		"	GND		4.0 V	"	"								1C		"	"
			48			GND		GND	"	"								1D		"	"
			49						4.0 V	"		4.0 V	GND		GND	GND		2A		"	"
			50							"		GND	4.0 V		4.0 V	"		2B		"	"
$T_C = -55^\circ\text{C}$	I_{IH2}		53				4.0 V			"								1Y		10	"
			54				"			"				4.0 V				2Y		10	"

1/ Pins not designated may be HIGH level logic, LOW level logic, or open.

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. Electrical parameters shall be as specified in table II herein.

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 test parameters shall be as specified in table II herein.
- b. Subgroups 3 and 4 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. 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) $T_A = +125^{\circ}\text{C}$ 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 current and positive when flowing into the referenced terminal.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging of microcircuits shall be 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 logistic support of existing equipment.

6.3 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.
- d. Requirements for notification of change of product or process to the contracting 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.

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

GND	- - - - -	Electrical ground (common terminal)
I _{IN}	- - - - -	Current flowing into an input terminal
I _{CEX}	- - - - -	Collector cutoff current
V _{IN}	- - - - -	Voltage level at an input terminal

6.5 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) and lead material and finish C (see 3.3). Longer length leads and lead forming shall not affect the part number.

6.6 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.

6.7 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.

<u>Military device type</u>	<u>Generic-industry type</u>
01	932
02	944
03	957
04	958
05	933

6.8 Ordering guidance. Since the qualification and certification requirements have been removed from the specification, orders may be placed immediately.

6.9 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:

Army - ER
Navy - EC
Air Force - 17

Preparing activity:

Air Force - 17

(Project 5962-0591-3)

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