

[QUALIFICATION]
[REQUIREMENTS]
[REMOVED]

MIL-M-38510/476A(NASA)

9 August 1983

SUPERSEDING

MIL-M-38510/476(NASA)

30 September 1980

MILITARY SPECIFICATION

MICROCIRCUITS, DIGITAL, CMOS 4-BIT BUS BUFFER/SEPARATOR, MONOLITHIC SILICON

[INACTIVE FOR NEW DESIGN AFTER DATE OF THIS REVISION.]

This specification is approved for use by George C. Marshall Space Flight Center, National Aeronautics and Space Administration, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the detail requirements for a monolithic silicon, silicon gate CMOS microcircuit. 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 as specified in MIL-M-38510, except the "JAN" and "J" certification shall not be used.

1.2.1 Device type. The device type shall be as follows:

<u>Device type</u>	<u>Circuit</u>
01	4-bit memory data bus buffer/separator
02	4-bit Input/Output bus buffer/separator

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:

<u>Outline letter</u>	<u>Case outline (see MIL-M-38510, appendix C)</u>
E	D-2 (16-Lead, 1/4" x 7/8"), dual-in-line package
F	F-5 (16-lead, 1/4" x 3/8"), flat package

1.3 Absolute maximum ratings.

Storage temperature range (T_{stg})	- - - - -	-65°C to +150°C
Case operating temperature range (T_C)	- - - - -	-55°C to +125°C
Supply voltage range ($V_{DD} - V_{SS}$)	- - - - -	-0.5 V dc to +13 V dc
Maximum power dissipation per package (P_D):		
For $T_C = -55$ to $+100^\circ\text{C}$	- - - - -	500 mW
For $T_C = +100$ to $+125^\circ\text{C}$	- - - - -	Derate linearly at 12 mW/ $^\circ\text{C}$ to 200 mW
Device dissipation per output transistor:		
For $T_C = -55$ to $+125^\circ\text{C}$	- - - - -	100 mW
Input voltage range, all inputs	- - - - -	-0.5 V dc to $V_{DD} + 0.5$ V dc
DC input current (any one input)	- - - - -	± 10 mA
Lead temperature (soldering, 10 seconds):		
At distance 1/16 $\pm 1/32$ inch (1.59 ± 0.79 mm)		
from case	- - - - -	265°C
Thermal resistance, junction to case (θ_{JC}):		
Case E	- - - - -	0.0833 $^\circ\text{C}/\text{mW}$
Case F	- - - - -	0.15 $^\circ\text{C}/\text{mW}$
Junction temperature (T_J)	- - - - -	+150°C

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: George C. Marshall Space Flight Center, National Aeronautics and Space Administration, ATTN: EG02, Marshall Space Flight Center, AL 35812, 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_{DD} - V_{SS}) - - - -	+4.5 V dc minimum to +11 V dc maximum
Input low (V_{IL}) voltage range- - - -	0 to +1.5 V dc at V_{DD} = +5 V dc;
	0 to +3 V dc at V_{DD} = +10 V dc
Input high (V_{IH}) voltage range - - -	+3.5 V dc to +5 V dc at V_{DD} = +5 V dc;
	+7 V dc to +10 V dc at V_{DD} = +10 V dc

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 2.

3.2.3 Truth tables and functional description. The functional description shall be as specified in the truth table on figure 3.

3.2.4 Case outlines. The case outlines shall be as specified in MIL-M-38510 and 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. Electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table III.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $V_{SS} = 0 \text{ V}$, $-55^\circ\text{C} < T_A < 125^\circ\text{C}$ Unless otherwise specified	Device type	Limits		Unit
				Min	Max	
Positive clamping input to V_{DD}	$V_{IC(POS)}$	$T_C = 25^\circ\text{C}$, $V_{DD} = 0 \text{ V}$ $V_{SS} = \text{Open}$, Output = Open, $I_I = 1 \text{ mA}$	A11		3.0	V
Negative clamping input to V_{SS}	$V_{IC(NEG)}$	$T_C = 25^\circ\text{C}$, $V_{DD} = \text{Open}$, $V_{SS} = 0 \text{ V}$, Output = Open, $I_I = -1 \text{ mA}$	A11	-3.0		V
Quiescent supply current	I_{SS}	Any combination of inputs	A11	-100		μA
High level output voltage	V_{OH1}	$V_{DD} = 10 \text{ V}$, $I_{OH} \leq 1 \mu\text{A}$ (see table III for V_I)	A11	9.95		V
Low level output voltage	V_{OL1}	$V_{DD} = 10.0 \text{ V}$, $I_{OL} \leq 1 \mu\text{A}$ (see table III for V_I)	A11	0.05		V
Output high (source) current	I_{OH1} I_{OH2}	$V_{DD} = 5.0 \text{ V}$, $V_{OH1} = 4.6 \text{ V}$ $V_{DD} = 10.0 \text{ V}$, $V_{OH2} = 9.5 \text{ V}$	A11	-1.1 -2.6		mA
Output low (sink) current	I_{OL1} I_{OL2}	$V_{DD} = 5.0 \text{ V}$, $V_{OL1} = 0.4 \text{ V}$ $V_{DD} = 10.0 \text{ V}$, $V_{OL2} = 0.5 \text{ V}$	A11	1.5 2.6		mA
High impedance three-state output leakage	I_Z (high Z)	$V_{DD} = 13.0 \text{ V}$ (see table III for V_I)	A11		± 5	μA
Input current, high	I_{IH}	$V_{DD} = 13.0 \text{ V}$, $V_I = 13.0 \text{ V}$	A11		1	μA
Input current, low	I_{IL}	$V_{DD} = 13.0 \text{ V}$, $V_I = 0$	A11		-1	μA
Propagation delay high to low	t_{PHL}	$C_L = 100 \text{ pF}$, $R_L = 200 \text{ k}\Omega$	A11	150	300	ns
		$V_{DD} = 5.0 \text{ V}$	A11	9	180	ns
		$V_{DD} = 10.0 \text{ V}$	A11	9	180	ns
Propagation delay low to high	t_{PLH}	$C_L = 100 \text{ pF}$, $R_L = 100 \text{ k}\Omega$	A11	15	300	ns
		$V_{DD} = 5.0 \text{ V}$	A11	9	180	ns
Propagation delay high Z to low level	t_{PZL}	$C_L = 100 \text{ pF}$, $R_L = 10 \text{ k}\Omega$	A11	15	300	ns
		$V_{DD} = 5.0 \text{ V}$	A11	9	180	ns
Propagation delay low Z to high level	t_{PZH}	$C_L = 100 \text{ pF}$, $R_L = 10 \text{ k}\Omega$	A11	15	300	ns
		$V_{DD} = 5.0 \text{ V}$	A11	9	180	ns
Transition time high to low level (DB or DO)	t_{THL}	$C_L = 100 \text{ pF}$, $R_L = 200 \text{ k}\Omega$	A11		156	ns
		$V_{DD} = 5.0 \text{ V}$	A11		74	ns
Transition time low to high level (DB or DO)	t_{TLH}	$C_L = 100 \text{ pF}$, $R_L = 200 \text{ k}\Omega$	A11		156	ns
		$V_{DD} = 5.0 \text{ V}$	A11		74	ns

3.6 Marking. Marking shall be in accordance with MIL-M-38510. 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.

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 table III) unless otherwise specified Class B devices
Interim electrical parameters (pre burn-in) (method 5004)	1
Interim electrical parameters (between static and dynamic) (method 5004)	N/A
Final electrical test parameters (method 5004)	1*,2,7*,8
Group A test requirements (method 5005)	1,2,7,8,9
Group B electrical parameters (method 5005)	None
Group B VZAP (method 5005)	4.5.2
Group C end-point electrical parameters (method 5005)	1,2,7,8
Additional electrical subgroups for group C periodic inspections (method 5005)	10,11
Group D end-point electrical parameters (method 5005)	1,2,7,8

* PDA applies to subgroups 1 and 7 (see 4.2b).

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 modifications and additional criteria shall apply:

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

- (1) The burn-in test as described in 3.1.10 of method 5004 shall be performed as indicated. (3.1.11 and 3.1.12 are not required; 3.1.9 is required for class B devices.)
- (2) For class B devices, dynamic burn-in shall be performed for 160 hours minimum at 125°C ambient temperature, using the circuit shown on figure 4, or equivalent.

- b. The percent defective allowable (PDA) for class B devices shall be 10 percent (or one device, whichever is greater) based on failures from group A, subgroups 1 and 7 (after cooldown) of final electrical test, excluding delta limits, 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, subgroups 1 and 7, 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.
- c. Interim and final electrical 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.

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 6.6) 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.

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, and 6 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. A special subgroup shall be added using a LTPD of 15 for class B. This subgroup shall consist of a high-voltage test of the input protection circuits, VZAP (see 4.5.2).

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. Steady-state life test (method 1005 of MIL-STD-883) conditions:
 - (1) Test condition D or E using the circuit shown on figure 4, or equivalent.
 - (2) $T_A = +125^\circ\text{C}$, minimum.
- c. 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 as specified for subgroups 10 and 11 of group A.

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.

Device types 01 and 02

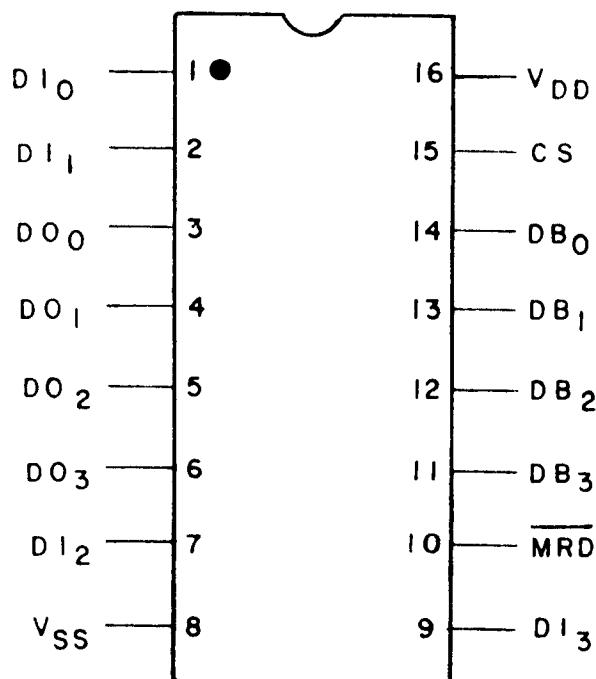
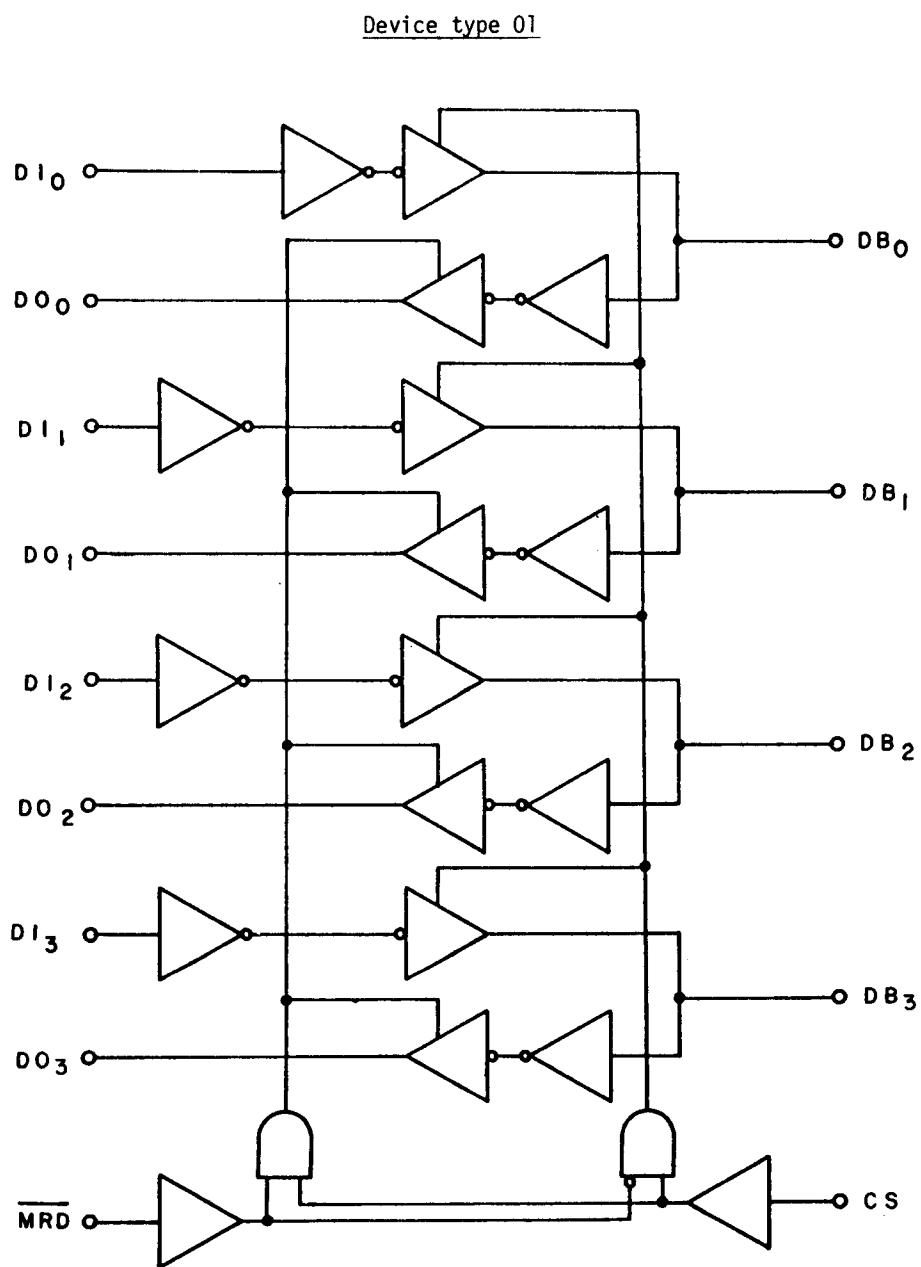
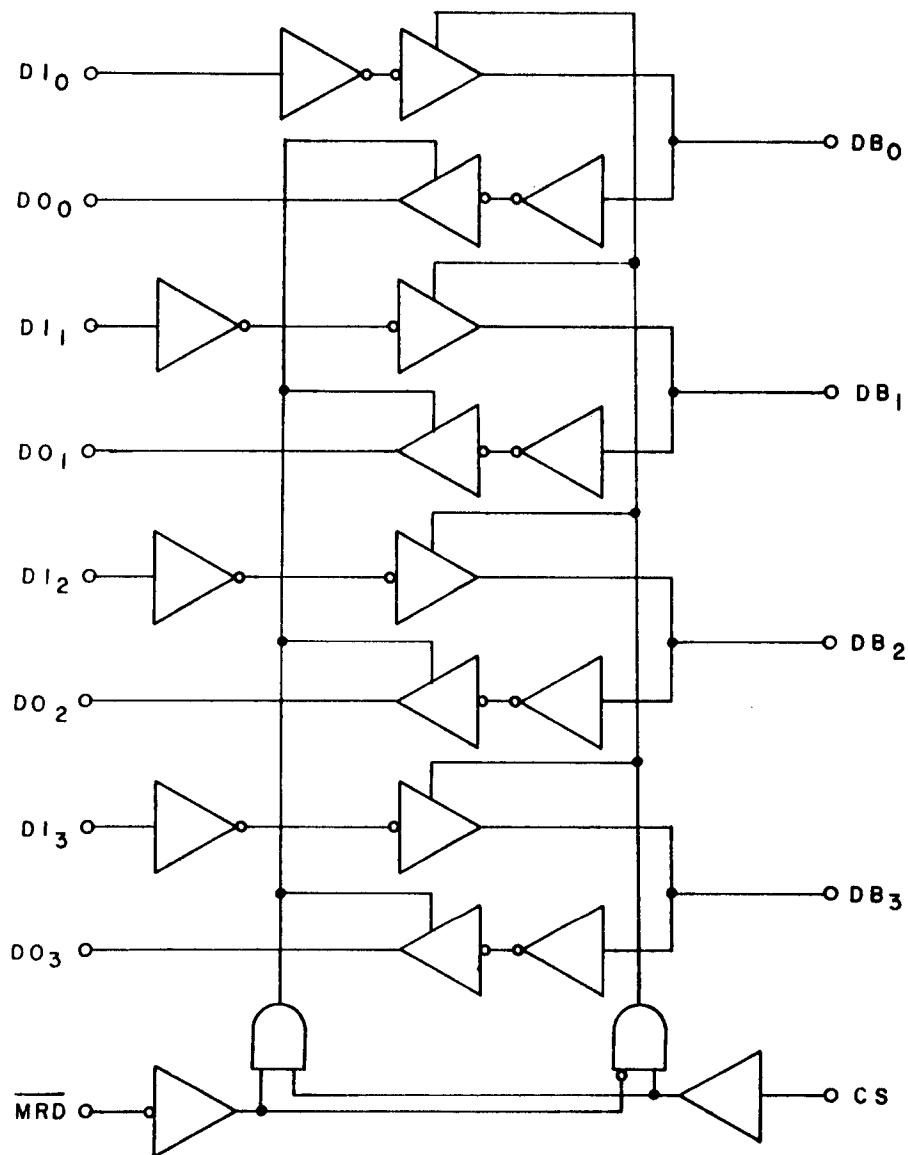


FIGURE 1. Terminal connections.

FIGURE 2. Logic diagram.

Device type 02FIGURE 2. Logic diagram - Continued.

Device type 01

CS	<u>MRD</u>	DATA BUS OUTPUTS (DB 0 - DB 3)	DATA OUTPUTS (DO 0 - DO 3)
L	X	High impedance	High impedance
H	L	Data input	High impedance
H	H	High impedance	Data bus input

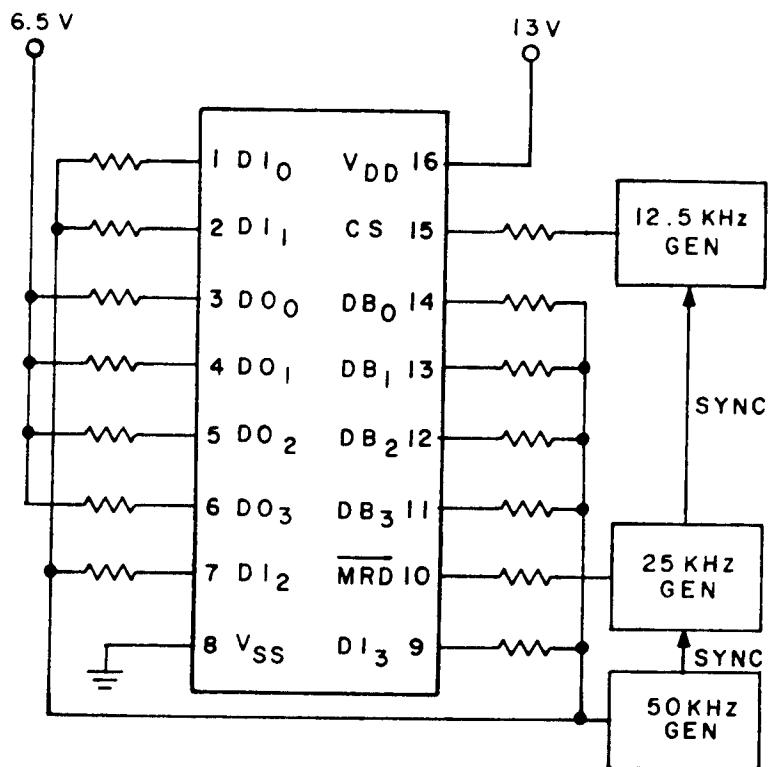
Device type 02

CS	<u>MRD</u>	DATA BUS OUTPUTS (DB 0 - DB 3)	DATA OUTPUTS (DO 0 - DO 3)
L	X	High impedance	High impedance
H	L	High impedance	Data bus input
H	H	Data input	High impedance

NOTES:

1. L = Low level logic
2. H = High level logic
3. X = Don't care

FIGURE 3. Truth table.

Device types 01 and 02

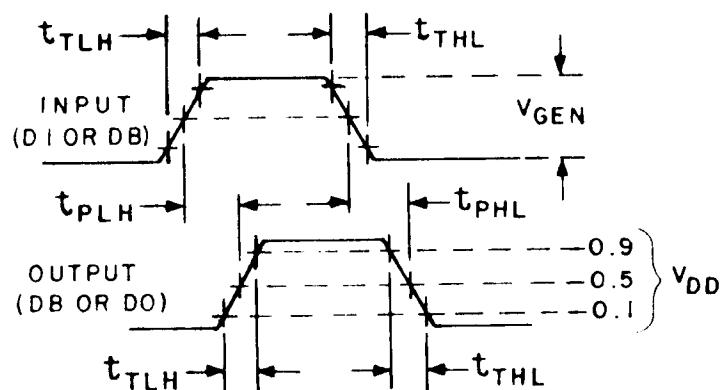
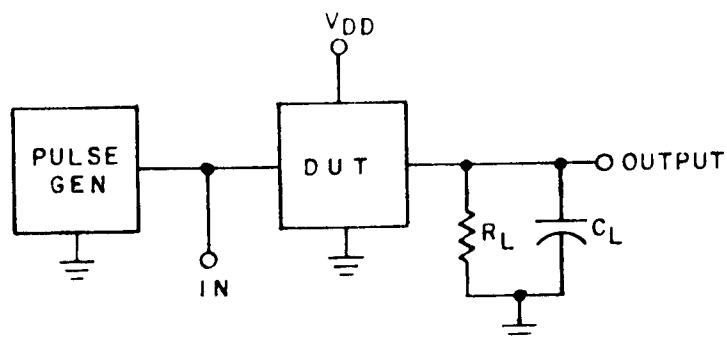
NOTES:

1. All resistor shall be 0-47 kilohms maximum.

2. Input signal requirements:

- a. Square wave, 50% duty cycle synchronized like a 3-stage divider.
- b. Voltage = 0 to 13 V $\pm 2\%$.
- c. $t_{TLH} = t_{THL} \leq 1 \mu s$.

FIGURE 4. Dynamic burn-in and steady state life test circuit.

Device types 01 and 02

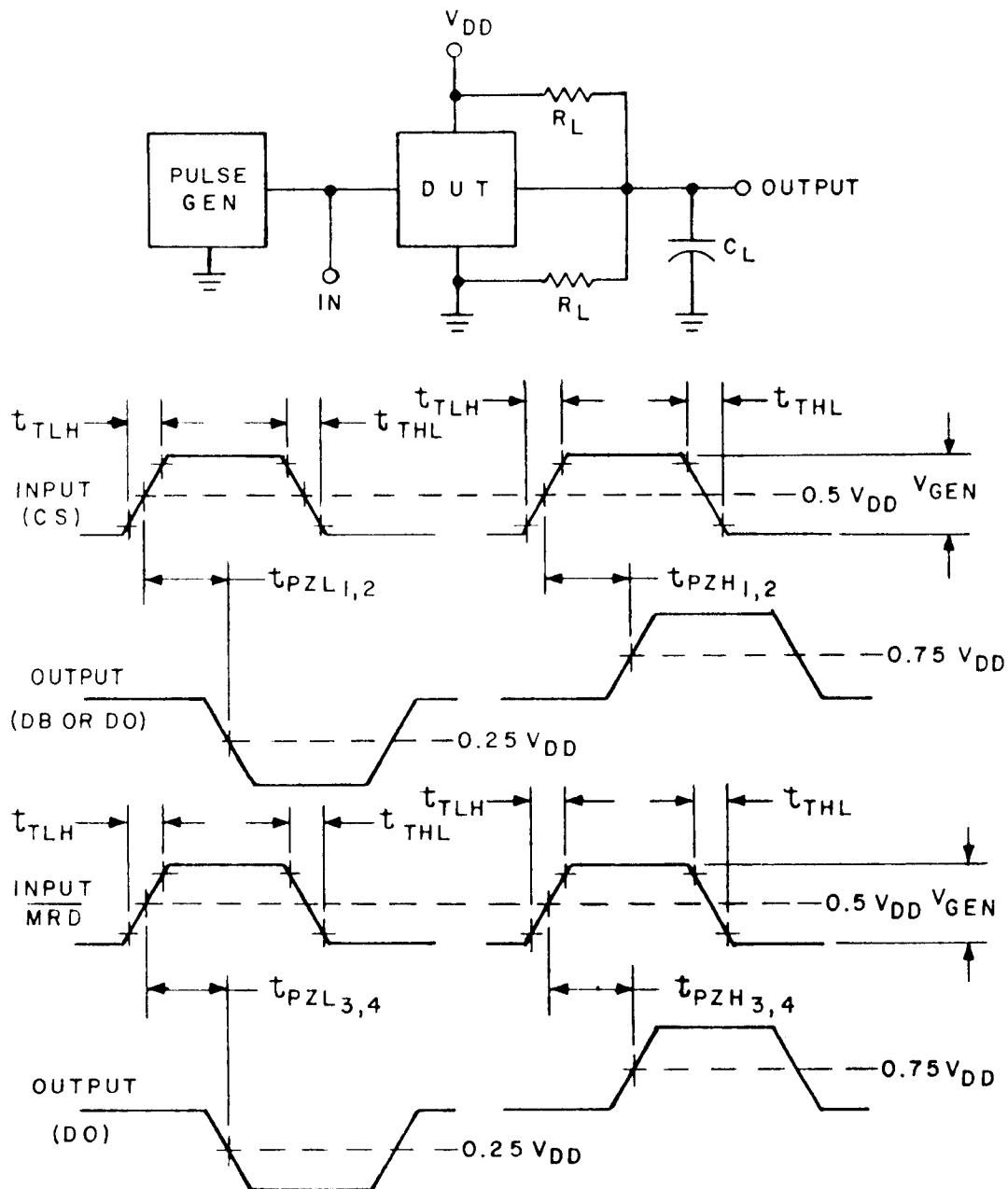
$$R_L = 200 \text{ k}\Omega \pm 1\%.$$

$C_L = 100 \text{ pF} \pm 5\%$
(includes wiring
and probe capacitance).

NOTES:

1. The pulse generator has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1.0\%$, $t_{TLH} = t_{THL} = 10 \pm 2 \text{ ns}$.
2. See table III for complete terminal connections.

FIGURE 5a. Switching time test circuit and waveforms.

Device types 01 and 02

$R_L = 10 \text{ k}\Omega \pm 1\%$.

$C_L = 100 \text{ pF} \pm 5\%$
(including wiring
and probe capacitance).

NOTES:

1. The pulse generator has the following characteristics:
 $V_{GEN} = V_{DD} \pm 1.0\%$, $t_{TLH} = t_{THL} = 10 \pm 2 \text{ ns}$.
2. See table III for complete terminal conditions.

FIGURE 5b. Switching time test circuit and waveforms.

TABLE III. Group A inspection for device type 01.

Symbol	MIL-STD-883	Test no.	Terminal conditions and limits												Measured [Subgroup 1 Terminal] $T_C = 23^\circ C$	Measured [Subgroup 2 Terminal] $T_C = 125^\circ C$	Measured [Subgroup 3 Terminal] $T_C = -55^\circ C$	
			D10	D11	D00	D01	D02	D03	VSS	D12	D13	MRD	DB3	VDD	CS	Min	Max	Min
V_{IC} (pos)		1	1 mA											GND	D10	3.0		
		2		1 mA										"	D11	"		
		3			1 mA									"	D12	"		
		4				1 mA								"	D13	"		
		5					1 mA							"	MRD	"		
		6						1 mA						"	DB3	"		
		7							1 mA					"	DB2	"		
		8								1 mA				"	DB1	"		
		9									1 mA			"	DB0	"		
		10												"	CS	"		
V_{IC} (neg)		11	-1 mA											GND	D10	-3.0		
		12		-1 mA										"	D11	"		
		13			1 mA									"	D12	"		
		14				1 mA								"	D13	"		
		15					1 mA							"	MRD	"		
		16						1 mA						"	DB3	"		
		17							1 mA					"	DB2	"		
		18								1 mA				"	DB1	"		
		19									1 mA			"	DB0	"		
		20												"	CS	"		
I_{SS}		21	13.0 V	13.0 V										GND	D10	20		
		22	"	"										"	V _{SS}	"		
		23	"	"										"	"	"		
		24	"	"										"	"	"		
		25	"	"										"	"	"		
		26	GND	GND										GND	GND	100		
V_{OH1}		27	10.0 V	10.0 V										13.0 V	GND	20		
		28	"	"										"	GND	"		
		29	"	"										"	"	"		
		30	"	"										"	"	"		
		31	"	"										"	"	"		
		32	"	"										"	"	"		
		33	"	"										"	"	"		
		34	"	"										"	"	"		
V_{OL1}		35	GND	GND										GND	10.0 V	GND		
		36	"	"										"	"	"		
		37	"	"										"	"	"		
		38	"	"										"	"	"		
		39	"	"										"	"	"		
		40	"	"										"	"	"		
		41	"	"										"	"	"		
		42	"	"										"	"	"		
I_{OH1}		43	V_{DD_u}	4.6 V	4.6 V									V_{DD_u}	V_{DD_u}	5.0 V		
		44	"	"	"									"	"	"		
		45	"	"	"									"	"	"		
		46	"	"	"									"	"	"		
		47	"	"	"									"	"	"		
		48	"	"	"									"	"	"		
		49	"	"	"									"	"	"		
		50	"	"	"									"	"	"		
I_{OH2}		51	"	"	9.5 V	9.5 V								V_{DD_u}	V_{DD_u}	10.0 V		
		52	"	"	"	"								"	"	"		
		53	"	"	"	"								"	"	"		
		54	"	"	"	"								"	"	"		
		55	"	"	"	"								"	"	"		
		56	"	"	"	"								"	"	"		
		57	"	"	"	"								"	"	"		
		58	"	"	"	"								"	"	"		

See footnotes at end of table.

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

Symbol	Cases	STD-883 method	E, F	Terminal conditions and limits												Measured terminal	Subgroup 1	Subgroup 2	Subgroup 3	test limits	
				Test no.	D00	D01	D02	D03	V _{SS}	D1 ₂	D1 ₃	W _{RD}	D _B 2	D _B 3	D _B 0	CS	V _{DD}	T _C = 25 °C	T _C = 125 °C	T _C = -55 °C	Unit
I ₀₁ 1	59	GND	"	0.4 V	0.4 V	"	"	GND	GND	GND	GND	GND	GND	GND	GND	0.0 V	0.0 V	D01	D02	D03	mA
	60	"	"	"	"	0.4 V	0.4 V	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	61	"	"	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	D02	D03	D04	"
	62	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D02	D03	D04	"
	63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D02	D03	D04	"
	64	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D02	D03	D04	"
I ₀₁ 2	65	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	66	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	67	"	"	"	"	0.5 V	0.5 V	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	68	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	69	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	70	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
I ₀₁ 3	71	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	72	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	73	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	75	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	76	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
I ₀₁ 4/ (H ₁ F Z)	77	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
I ₀₁ 5/ (H ₁ F Z)	79	11.0 V	11.0 V	"	"	"	"	"	11.0 V	"	11.0 V	"	"	"	"	"	"	D01	D02	D03	"
	80	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	81	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	83	13.0 V	GND	13.0 V	GND	"	"	GND	GND	"	"	GND	GND	"	"	"	"	D01	D02	D03	"
	84	"	"	"	"	"	"	GND	13.0 V	GND	13.0 V	GND	13.0 V	GND	13.0 V	GND	"	D01	D02	D03	"
I ₀₁ 6/ I ₀₁ 7	85	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	86	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	87	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	88	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	89	GND	13.0 V	GND	13.0 V	GND	"	GND	13.0 V	GND	13.0 V	GND	13.0 V	GND	13.0 V	GND	"	D01	D02	D03	"
	90	"	13.0 V	GND	13.0 V	GND	"	GND	13.0 V	GND	13.0 V	GND	13.0 V	GND	13.0 V	GND	"	D01	D02	D03	"
I ₀₁ 8/ I ₀₁ 9	91	"	"	13.0 V	"	"	"	GND	13.0 V	GND	13.0 V	GND	13.0 V	GND	13.0 V	GND	"	D01	D02	D03	"
	92	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	93	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	94	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D01	D02	D03	"
	95	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	A1	3/	3/	3/
	96	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	A1	3/	3/	3/

See footnotes at end of table.

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

Symbol	MIL-STD-883 method	Cases E,F	D1 D1	D0 D0	D01 D01	D02 D02	D03 D03	VSS VSS	D12 D12	HRD HRD	D13 D13	DB2 DB2	DB3 DB3	DB0 DB0	CS CS	VDD VDD	Test limits				
																	Subgroup 10 terminal TC = 125 C	Subgroup 9 terminal TC = 25 C	Subgroup 11 TC = -55 C		
no.	test no.																Min	Max	Min	Max	
tPHL1	3003	97	IN	GND	IN												10.0 V	9	190	5	190
	Fig. 5a	98	GND	"	GND	"											DB0 to	"	"	"	"
	"	99	"	GND	"												DB1 to	"	"	"	"
	"	100	"	"	"												DB2 to	"	"	"	"
	"	101	"	"	OUT												DB3 to	"	"	"	"
	"	102	"	"	OUT												DB0 to	"	"	"	"
	"	103	"	"	OUT												DB1 to	"	"	"	"
	"	104	"	"	OUT												DB2 to	"	"	"	"
																	DB3 to	"	"	"	"
tPHL2	"	105	IN	GND													10.0 V	5	100	9	180
	"	106	GND	IN	GND												DB0 to	"	"	"	"
	"	107	"	"	"												DB1 to	"	"	"	"
	"	108	"	"	OUT												DB2 to	"	"	"	"
	"	109	"	"	OUT												DB3 to	"	"	"	"
	"	110	"	"	OUT												DB0 to	"	"	"	"
	"	111	"	"	OUT												DB1 to	"	"	"	"
	"	112	"	"	OUT												DB2 to	"	"	"	"
																	DB3 to	"	"	"	"
tPLH1	"	113	IN														15.0 V	5	190	9	190
	"	114	GND	IN	GND												DB0 to	"	"	"	"
	"	115	"	"	GND												DB1 to	"	"	"	"
	"	116	"	"	OUT												DB2 to	"	"	"	"
	"	117	"	"	OUT												DB3 to	"	"	"	"
	"	118	"	"	OUT												DB0 to	"	"	"	"
	"	119	"	"	OUT												DB1 to	"	"	"	"
	"	120	"	"	OUT												DB2 to	"	"	"	"
																	DB3 to	"	"	"	"
tPLH2	"	121	IN	"													10.0 V	5	100	9	180
	"	122	GND	IN	GND												DB0 to	"	"	"	"
	"	123	"	"	GND												DB1 to	"	"	"	"
	"	124	"	"	OUT												DB2 to	"	"	"	"
	"	125	"	"	OUT												DB3 to	"	"	"	"
	"	126	"	"	OUT												DB0 to	"	"	"	"
	"	127	"	"	OUT												DB1 to	"	"	"	"
	"	128	"	"	OUT												DB2 to	"	"	"	"

See footnotes at end of table.

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

Symbol	Cases STD- 883 method no.	Test no.	Terminal conditions and limits V_T										Test limits				
			D10	D11	D00	D01	D02	D03	D12	VSS	D13	DB0	DB1	DB2	DB3	CS	VDD
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
tpZL1	Fig- 5b	129	GND	GND	"	"	"	"	"	"	"	"	"	"	"	IN	5.0 V
	"	130	"	"	"	"	"	"	"	"	"	"	"	"	"	DB0	"
	"	131	"	"	"	"	"	"	"	"	"	"	"	"	"	CS to DB1	"
	"	132	"	"	"	"	"	"	"	"	"	"	"	"	"	CS to DB2	"
	"	133	"	"	"	"	"	"	"	"	"	"	"	"	"	CS to DB3	"
	"	134	"	"	"	"	"	"	"	"	"	"	"	"	"	CS to D01	"
	"	135	"	"	"	"	"	"	"	"	"	"	"	"	"	CS to D01	"
	"	136	"	"	"	"	"	"	"	"	"	"	"	"	"	CS to D02	"
																CS to D03	"
tpZL2	Fig- 8b	137	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
	"	138	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
	"	139	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
	"	140	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
	"	141	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
	"	142	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
	"	143	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
	"	144	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
tpZL3		145	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		146	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		147	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		148	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
tpZL4		149	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		150	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		151	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		152	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
tpZH1		153	V _{DD}	V _{DD}	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		154	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		155	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		156	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		157	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		158	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		159	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"
		160	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 Class E, F	Test conditions and limits $\frac{V_{DD}}{V_{SS}}$												Test limits									
		D00	D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	Measured terminal V_{DD}	Subgroup 9 terminal $T_C = 25^\circ C$	Subgroup 10 terminal $T_C = 125^\circ C$	Subgroup 11 terminal $T_C = -55^\circ C$	Unit
tpZH2	Fig. 161	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	10.0 V	5	100	5	100 ns	
	162	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB0	"	"	"	"
	163	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB1	"	"	"	"
	164	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB2	"	"	"	"
	165	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB3	"	"	"	"
	166	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CS to CS	"	"	"	"
	167	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB0 to CS	"	"	"	"
	168	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB1 to CS	"	"	"	"
	169	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB2 to CS	"	"	"	"
	170	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB3 to CS	"	"	"	"
	171	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO1 to CS	"	"	"	"
	172	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO2 to CS	"	"	"	"
	173	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO3 to CS	"	"	"	"
	174	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	MRD to DO1	"	"	"	"
	175	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	MRD to DO2	"	"	"	"
	176	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	MRD to DO3	"	"	"	"
	tpZH4	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	10.0 V	5	100	9	180 5 100
	177	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB0 to DO1	"	"	"	"
	178	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB1 to DO1	"	"	"	"
	179	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB2 to DO1	"	"	"	"
	180	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB3 to DO1	"	"	"	"
	181	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO2 to DO1	"	"	"	"
	182	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO3 to DO1	"	"	"	"
	183	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO2 to DO2	"	"	"	"
	184	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO3 to DO2	"	"	"	"
	tTHL2	"	185	IN	"	GND	"	GND	110.0 V	56	74	44	"										
		"	186	IN	"	GND	"	GND	DB0	"	"	"	"										
		"	187	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB1	"	"	"	"
		"	188	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB2	"	"	"	"
		"	189	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB3	"	"	"	"
		"	190	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO0	"	"	"	"
		"	191	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO1	"	"	"	"
		"	192	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO2	"	"	"	"
		"	193	IN	"	GND	"	GND	DO0	"	"	"	"										
		"	194	IN	"	GND	"	GND	DB1	"	"	"	"										
		"	195	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB2	"	"	"	"
		"	196	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DB3	"	"	"	"
		"	197	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO0	"	"	"	"
		"	198	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO1	"	"	"	"
		"	199	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO2	"	"	"	"
		"	200	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	DO3	"	"	"	"

See footnotes at end of table.

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

Symbol	MIL-STD-883 Cases E,F	Test no.	Terminal conditions and limits												Test limits											
			D10	D11	D00	D01	D02	D03	DI2	V _S	D13	MRD	DB3	DB2	DB1	DB0	CS	V _{D0}	Measured terminal	Subgroup 9	Subgroup 10	Subgroup 11	TC = 25°C	TC = 125°C	TC = -55°C	Unit
tTLR2	3004	201	IN	GND							GND	GND	GND			OUT	V _{D0}	10.0 V	DB0				56		74	ns
	Fig. 5a	202	GND	IN							GND	"	"			OUT	V _{D0}	"	DB1				"		"	"
	"	203	"	GND	"						GND	"	"			OUT	V _{D0}	"	DB2				"		"	"
	"	204	"	"	"						GND	"	"			OUT	V _{D0}	"	DB3				"		"	"
	"	205	"	"	"	OUT					GND	"	"			OUT	V _{D0}	"	DO0				"		"	"
	"	206	"	"	"	OUT	OUT				GND	"	"			OUT	V _{D0}	"	DO1				"		"	"
	"	207	"	"	"	OUT	OUT				GND	"	"			OUT	V _{D0}	"	DO2				"		"	"
	"	208	"	"	"	OUT	OUT				GND	"	"			OUT	V _{D0}	"	DO3				"		"	"

See footnotes at end of table.

TABLE III. Group A inspection for device type 02.

Symbol	ML-83- method	Cases no.	Terminal conditions and limits \mathcal{U}										Test limits								
			D ₀	D ₁	D ₀₀	D ₀₁	D ₀₂	D ₀₃	D ₁₂	D ₁₃	M _{R0}	D _B 2	D _B 1	D _B 0	CS	V _D	Measured terminal	Subgroup 1 TC = 25°C	Subgroup 2 TC = 125°C	Subgroup 3 TC = -55°C	Unit
V _{IIC} (pos)		1	1 mA		1 mA										GND	D ₁₀	3.0				
		2		1 mA											"	D ₁₁	"				
		3													"	D ₁₂	"				
		4													"	M _{R1}	"				
		5													"	D ₀₃	"				
		6													"	D ₀₂	"				
		7													"	D ₀₁	"				
		8													"	D ₀₀	"				
		9													"	C _S	"				
		10																			
V _{IIC} (neg)		11	-1 mA		-1 mA										GND	D ₁₀	3.0				
		12		1 mA											"	D ₁₁	"				
		13			-1 mA										"	D ₁₂	"				
		14													"	M _{R1}	"				
		15													"	D ₀₃	"				
		16													"	D ₀₂	"				
		17													"	D ₀₁	"				
		18													"	D ₀₀	"				
		19																			
		20																			
I _S	3005	21	13.0 V	13.0 V											13.0 V	GND	GND	GND	GND	GND	
	"	22	"	"	"										"	13.0 V	GND	GND	GND	GND	
	"	23	"	"	"										"	13.0 V	"	"	"	"	
	"	24	"	"	"										"	13.0 V	"	"	"	"	
	"	25	"	"	"										"	13.0 V	"	"	"	"	
	"	26	GND	GND											"	13.0 V	"	"	"	"	
V _{OH1}	3006	27	10.0 V	10.0 V											10.0 V	10.0 V	10.0 V	10.0 V	10.0 V	10.0 V	V _{SS}
	"	28	"	"	"										"	"	"	"	"	"	-20 μ A
	"	29	"	"	"										"	"	"	"	"	"	
	"	30	"	"	"										"	"	"	"	"	"	
	"	31	"	"	"										"	"	"	"	"	"	
	"	32	"	"	"										"	"	"	"	"	"	
	"	33	"	"	"										"	"	"	"	"	"	
	"	34	"	"	"										"	"	"	"	"	"	
V _{OL1}	3007	35	GND	GND											GND	GND	GND	GND	GND	GND	
	"	36	"	"	"										"	"	"	"	"	"	.05
	"	37	"	"	"										"	"	"	"	"	"	
	"	38	"	"	"										"	"	"	"	"	"	
	"	39	"	"	"										"	"	"	"	"	"	
	"	40	"	"	"										"	"	"	"	"	"	
	"	41	"	"	"										"	"	"	"	"	"	
	"	42	"	"	"										"	"	"	"	"	"	
I _{IOH1}		43	V _{DD}	4.6 V	4.6 V										V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	V _{DD}	
		44	"	"	"										"	"	"	"	"	"	-2.1 mA
		45	"	"	"										"	"	"	"	"	"	
		46	"	"	"										"	"	"	"	"	"	
		47	"	"	"										"	"	"	"	"	"	
		48	"	"	"										"	"	"	"	"	"	
		49	"	"	"										"	"	"	"	"	"	
		50	"	"	"										"	"	"	"	"	"	
I _{IOH2}		51	"	"	9.5 V	9.5 V									"	"	"	"	"	"	-2.6 μ A
		52	"	"	"	"									"	"	"	"	"	"	
		53	"	"	"	"									"	"	"	"	"	"	
		54	"	"	"	"									"	"	"	"	"	"	
		55	"	"	"	"									"	"	"	"	"	"	
		56	"	"	"	"									"	"	"	"	"	"	
		57	"	"	"	"									"	"	"	"	"	"	
		58	"	"	"	"									"	"	"	"	"	"	

See footnotes at end of table.

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

Symbol	MIL-STD-883	Test no.	Test limits												Measured terminal I _{terminal}	Subgroup 1	Subgroup 2	Subgroup 3	Unit			
			I _{uses}	D ₁₀	D ₁₁	B ₀₀	B ₀₁	B ₀₂	V _{SS}	D ₁₂	B ₀₃	M _{R0}	D _{B1}	D _{B2}	CS	V _{D0}	Min	Max	Min	Max		
I _{O11}	59	GND	0.4 V	0.4 V	"	GND	5.0 V	D ₀₀	2.1	1.5	2.8	mA										
	60	"	"	"	0.4 V	"	"	"	"	"	"	"	"	"	"	"	D ₀₁	"	"	"	"	
	62	"	"	"	0.4 V	0.4 V	"	"	"	"	"	"	"	"	"	"	D ₀₂	"	"	"	"	
	63	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D ₀₃	"	"	"	"	
	64	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D _{B3}	"	"	"	"	
	65	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D _{B1}	"	"	"	"	
I _{O12}	66	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	D _{B2}	"	"	"	"	
	67	"	"	"	"	0.5 V	0.5 V	0.5 V	"	"	"	"	"	"	"	"	D _{B0}	"	"	"	"	
	68	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	69	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	70	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	71	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{T2H2/Z} (Hz)	72	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	73	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	74	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	75	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	76	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	77	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{T2H2/Z} (Hz)	78	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	79	111.0 V	111.0 V	"	"	"	"	"	"	111.0 V	"	"	"	"	"	"	"	"	"	"	"	
	80	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	81	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	82	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
I _{T1H2/Z} (Hz)	83	113.0 V	GND	113.0 V	GND	"	GND	GND	GND	D ₁₀	.5	1	.5	mA								
	84	"	"	85	GND	"	"	"	"	13.0 V	GND	13.0 V	GND	13.0 V	GND	GND	GND	D ₁₁	"	"	"	"
	85	"	"	86	"	"	"	"	"	"	"	"	"	"	"	"	"	D ₁₂	"	"	"	"
	86	"	"	87	"	"	"	"	"	"	"	"	"	"	"	"	"	D ₁₃	"	"	"	"
	87	"	"	88	"	"	"	"	"	"	"	"	"	"	"	"	"	M _{R0}	"	"	"	"
	88	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	CS	"	"	"	"
I _{T1L2/Z} (Hz)	89	"	13.0 V	GND	13.0 V	GND	"	13.0 V	GND	GND	GND	D ₁₀	-.5	-1	-5	mA						
	90	113.0 V	"	13.0 V	GND	"	"	"	"	13.0 V	GND	13.0 V	GND	13.0 V	GND	GND	GND	D ₁₁	"	"	"	"
	91	"	"	92	"	"	"	"	"	"	"	"	"	"	"	"	"	D ₁₂	"	"	"	"
	92	"	"	93	"	"	"	"	"	"	"	"	"	"	"	"	"	D ₁₃	"	"	"	"
	93	"	"	94	"	"	"	"	"	"	"	"	"	"	"	"	"	CS	"	"	"	"
	94	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
Functional tests	3014	95	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	4.5 V	A ₁₁	3/	3/	3/	3/	µA
	3014	96	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	3/	113.0 V	A ₁₁	3/	3/	3/	3/	mA
	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	
Subgroup 8																						
TC = 25°C																						
TC = 125°C																						
TC = -55°C																						

See footnotes at end of table.

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

Symbol	MIL-STD-883 Cases E,F	Test no.	terminal conditions and limits										Test limits									
			D10	D11	D00	D01	D02	D03	D12	VSS	D13	HARD	DB3	DB2	DB1	CS	VDD	Measured terminal TC = 125°C	Subgroup 9 terminal TC = 25°C	Subgroup 10 terminal TC = 125°C	Subgroup 11 terminal TC = -35°C	
tPHL1	3003	97	IN	GND	"	"	GND	GND	GND	"	"	"	OUT	OUT	VDD	5.0 V	D10 to DB0	9	190	300	ns	
	Fig: 5a	98	GND	IN	"	"	GND	"	GND	"	"	"	OUT	OUT	"	"	D11 to DB1	"	"	"	"	
	"	99	"	GND	"	"	"	"	"	"	"	"	OUT	OUT	"	"	D12 to DB2	"	"	"	"	
	"	100	"	"	"	OUT	"	GND	"	IN	"	"	OUT	OUT	"	"	D13 to DB3	"	"	"	"	
	"	101	"	"	"	OUT	"	"	"	GND	"	"	IN	IN	"	"	DB0 to D00	"	"	"	"	
	"	102	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	DB1 to D01	"	"	"	"	
	"	103	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	DB2 to D02	"	"	"	"	
	"	104	"	OUT	OUT	"	"	"	"	"	"	"	IN	IN	"	"	DB3 to D03	"	"	"	"	
tPHL2	"	105	IN	GND	"	"	"	"	"	VDD	"	"	OUT	OUT	"	"	10.0 V	D10 to DB0	5	100	9	100
	"	106	GND	IN	"	"	"	"	"	"	"	"	OUT	OUT	"	"	D11 to DB1	"	"	"	"	
	"	107	"	GND	"	"	IN	"	"	"	"	"	OUT	OUT	"	"	D12 to DB2	"	"	"	"	
	"	108	"	"	"	OUT	"	GND	"	IN	"	"	OUT	OUT	"	"	D13 to DB3	"	"	"	"	
	"	109	"	"	OUT	OUT	"	"	GND	"	"	"	IN	IN	"	"	DB0 to D00	"	"	"	"	
	"	110	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D01 to D01	"	"	"	"	
	"	111	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D02 to D02	"	"	"	"	
	"	112	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D03 to D03	"	"	"	"	
tPLH1	"	113	IN	"	"	"	"	"	VDD	"	"	"	OUT	OUT	"	"	5.0 V	D10 to DB0	9	190	300	9
	"	114	GND	IN	"	"	"	"	"	IN	"	"	OUT	OUT	"	"	D11 to DB1	"	"	"	"	
	"	115	"	GND	"	"	"	GND	"	IN	"	"	OUT	OUT	"	"	D12 to DB2	"	"	"	"	
	"	116	"	"	OUT	OUT	"	"	GND	"	"	"	IN	IN	"	"	D13 to DB3	"	"	"	"	
	"	117	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	DB0 to D00	"	"	"	"	
	"	118	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D01 to D01	"	"	"	"	
	"	119	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D02 to D02	"	"	"	"	
	"	120	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D03 to D03	"	"	"	"	
tPLH2	"	121	IN	"	"	"	"	"	VDD	"	"	"	OUT	OUT	"	"	10.0 V	D10 to DB0	5	100	9	180
	"	122	GND	IN	"	"	"	"	"	IN	"	"	OUT	OUT	"	"	D11 to DB1	"	"	"	"	
	"	123	"	GND	"	"	"	GND	"	IN	"	"	OUT	OUT	"	"	D12 to DB2	"	"	"	"	
	"	124	"	"	OUT	OUT	"	"	GND	"	"	"	IN	IN	"	"	D13 to DB3	"	"	"	"	
	"	125	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	DB0 to D00	"	"	"	"	
	"	126	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D01 to D01	"	"	"	"	
	"	127	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D02 to D02	"	"	"	"	
	"	128	"	"	OUT	OUT	"	"	"	"	"	"	IN	IN	"	"	D03 to D03	"	"	"	"	

See footnotes at end of table.

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

Symbol	MLT-Cases STD- 83 no.	Test no.	Terminal conditions and limits ΔV										Test limits													
			T0.0	D1	D00	D01	D02	D03	D12	VSS	D13	HRD	D83	DB2	DB1	CS	VDD	Measured terminal TC = 25°C	Subgroup 9 TC = 125°C	Subgroup 10 TC = -55°C	Subgroup 11 TC = 125°C	Min	Max			
tPZL1	F1g- 15b	129	GND	GND	"	"	"	"	"	GND	GND	VDD	"	"	OUT	IN	5.0 V	CS to DB0	"	10	200	15	300	10	200	
	"	130	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to DB1	"	"	"	"	"	"	"	
	"	131	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to DB2	"	"	"	"	"	"	"	
	"	132	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to DB3	"	"	"	"	"	"	"	
	"	133	"	"	"	"	"	"	"	"	"	"	"	"	GND	GND	GND	GND	"	"	"	"	"	"	"	
	"	134	"	"	"	"	"	"	"	"	"	"	"	"	GND	GND	GND	GND	"	"	"	"	"	"	"	
	"	135	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to D00	"	"	"	"	"	"	"	
	"	136	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to D01	"	"	"	"	"	"	"	
	"																	CS to D02	"	"	"	"	"	"	"	
	"																	CS to D03	"	"	"	"	"	"	"	
tPZL2	"	137	"	"	"	"	"	"	"	"	"	"	"	"	VDD	"	"	OUT	OUT	"	10.0 V	CS to DB0	5	100	9	180
	"	138	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to DB1	"	"	"	"	"	"	"	
	"	139	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to DB2	"	"	"	"	"	"	"	
	"	140	"	"	"	"	"	"	"	"	"	"	"	"	GND	GND	GND	GND	"	"	"	"	"	"	"	
	"	141	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to DB3	"	"	"	"	"	"	"	
	"	142	"	"	"	"	"	"	"	"	"	"	"	"	GND	GND	GND	GND	"	"	"	"	"	"	"	
	"	143	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to D00	"	"	"	"	"	"	"	
	"	144	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to D01	"	"	"	"	"	"	"	
	"																	CS to D02	"	"	"	"	"	"	"	
	"																	CS to D03	"	"	"	"	"	"	"	
tPZL3	"	145	"	"	"	"	"	"	"	"	"	"	"	"	IN	"	"	OUT	OUT	"	10.0 V	HRD to D00	10	200	15	300
	"	146	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	HRD to D01	"	"	"	"	"	"	"	
	"	147	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	HRD to D02	"	"	"	"	"	"	"	
	"	148	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	HRD to D03	"	"	"	"	"	"	"	
tPZL4	"	149	"	"	"	"	"	"	"	"	"	"	"	"	IN	"	"	OUT	OUT	"	10.0 V	HRD to D00	5	100	9	180
	"	150	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	HRD to D01	"	"	"	"	"	"	"	
	"	151	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	HRD to D02	"	"	"	"	"	"	"	
	"	152	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	HRD to D03	"	"	"	"	"	"	"	
tPZL1	"	153	VDD	VDD	"	"	"	"	"	"	"	"	"	"	VDD	"	"	OUT	IN	5.0 V	CS to DB0	10	200	15	300	
	"	154	"	"	"	"	"	"	"	"	"	"	"	"	OUT	GND	"	CS to DB1	"	"	"	"	"	"	"	
	"	155	"	"	"	"	"	"	"	"	"	"	"	"	OUT	GND	"	CS to DB2	"	"	"	"	"	"	"	
	"	156	"	"	"	"	"	"	"	"	"	"	"	"	GND	VDD	"	CS to DB3	"	"	"	"	"	"	"	
	"	157	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to D00	"	"	"	"	"	"	"	
	"	158	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to D01	"	"	"	"	"	"	"	
	"	159	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to D02	"	"	"	"	"	"	"	
	"	160	"	"	"	"	"	"	"	"	"	"	"	"	OUT	OUT	"	CS to D03	"	"	"	"	"	"	"	

See footnotes at end of table.

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

Symbol	ML-STD-883 Cases E,F	Test no.			terminal conditions and limits												test limits						
		1	2	3	D00	D01	D02	D03	D12	VSS	DI3	NRD	DB3	DB2	DB1	DB0	CS	VDD	Measured Subgroup 9 Terminal TC = 25°C	Subgroup 10 Terminal TC = 125°C	Subgroup 11 Terminal TC = -55°C	Unit	
																			Min	Max	Min	Max	
tpZH2 Fig. 5b		161	Vdd	Vdd	"	"	"	"	"	"	"	"	"	"	"	"	1N	10.0 V	IBB ₀ to CS to IB ₁	"	"	"	
		162	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IBB ₁ to CS to IB ₂	"	"	"	
		163	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IBB ₂ to CS to IB ₃	"	"	"	
		164	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IBB ₃ to CS to IB ₀	"	"	"	
		165	"	"	OUT	OUT	OUT	OUT	OUT	GND	VDD	VDD	VDD	VDD	VDD	VDD	"	"	IBD ₃ to CS to ID ₀	"	"	"	
		166	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	ID ₀ to CS to ID ₁	"	"	"	
		167	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	ID ₁ to CS to ID ₂	"	"	"	
		168	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	ID ₂ to CS to ID ₃	"	"	"	
tpZH3		169	"	"	OUT	OUT	OUT	OUT	OUT	IN	"	"	"	"	"	"	VDD	5.0 V	IRD ₀ to ID ₀	"	"	"	
		170	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IRD ₀ to ID ₁	"	"	"	
		171	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IRD ₀ to ID ₂	"	"	"	
		172	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IRD ₀ to ID ₃	"	"	"	
tpZH4		173	"	"	OUT	OUT	OUT	OUT	OUT	IN	"	"	"	"	"	"	VDD	10.0 V	IRD ₀ to ID ₀	"	"	"	
		174	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IRD ₀ to ID ₁	"	"	"	
		175	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IRD ₀ to ID ₂	"	"	"	
		176	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IRD ₀ to ID ₃	"	"	"	
tTHL1 Fig. 5a	3004	177	IN	GND	"	"	"	"	"	GND	"	"	"	GND	VDD	"	OUT	"	5.0 V	DB ₀ to DB ₁	"	"	
		178	GND	GND	"	"	"	"	"	IN	GND	"	"	IN	GND	"	OUT	"	DB ₂ to DB ₃	"	"	"	
		179	"	"	"	"	"	"	"	GND	"	"	"	GND	"	"	IN	"	DO ₀ to DO ₁	"	"	"	
		180	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IN	"	DO ₂ to DO ₃	"	"	"	
		181	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IN	"	"	"	"	"	
		182	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
		183	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
		184	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
tTHL2		185	IN	"	"	"	"	"	"	GND	"	"	"	GND	"	"	OUT	"	10.0 V	DB ₀ to DB ₁	"	"	
		186	GND	IN	"	"	"	"	"	IN	GND	"	"	IN	GND	"	OUT	"	DB ₂ to DB ₃	"	"	"	
		187	"	"	"	"	"	"	"	GND	"	"	"	GND	"	"	IN	"	DO ₀ to DO ₁	"	"	"	
		188	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IN	"	DO ₂ to DO ₃	"	"	"	
		189	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
		190	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
		191	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
		192	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
tTLH1		193	IN	"	"	"	"	"	"	GND	"	"	"	GND	"	"	OUT	"	5.0 V	DB ₀ to DB ₁	"	"	
		194	GND	IN	"	"	"	"	"	IN	GND	"	"	IN	GND	"	OUT	"	DB ₂ to DB ₃	"	"	"	
		195	"	"	"	"	"	"	"	GND	"	"	"	GND	"	"	IN	"	DO ₀ to DO ₁	"	"	"	
		196	"	"	"	"	"	"	"	"	"	"	"	"	"	"	IN	"	DO ₂ to DO ₃	"	"	"	
		197	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
		198	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
		199	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	
		200	"	"	"	"	"	"	"	"	"	"	"	"	"	"	OUT	"	"	"	"	"	

See footnotes at end of table.

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

Symbol	MLL- STD- 883	Cases I _E , F	Terminal conditions and limits V												Test limits								
			D10	D11	D00	D01	D02	D03	V _{SS}	D12	D13	MHD	DB3	DB2	DB1	DB0	CS	V _{DD}	Measured terminal T _c = 25°C	Subgroup 9	Subgroup 10	Subgroup 11	Unit
Method	Test no.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Min	Max	Min	Max	
t _{T1H2} Fig. 5a	3004	201	IN	GND					GND	GND	GND	"	"	"	OUT	OUT	V _{DD}	10.0 V	DB0	"	"	"	ns
	"	202	GND	IN					GND	GND	GND	"	"	"	OUT	OUT	V _{DD}	"	DB1	"	"	"	"
	"	203	"	GND	IN				GND	GND	GND	"	"	"	OUT	OUT	V _{DD}	"	DB2	"	"	"	"
	"	204	"	"	IN				GND	GND	GND	"	"	"	IN	IN	V _{DD}	"	DB3	"	"	"	"
	"	205	"	"	"	OUT			GND	GND	GND	"	"	"	IN	IN	V _{DD}	"	D00	"	"	"	"
	"	206	"	"	"	OUT	OUT		GND	GND	GND	"	"	"	IN	IN	V _{DD}	"	D01	"	"	"	"
	"	207	"	"	"	OUT	OUT	OUT	GND	GND	GND	"	"	"	IN	IN	V _{DD}	"	D02	"	"	"	"
	"	208	"	"	"	OUT	OUT	OUT	GND	GND	GND	"	"	"	IN	IN	V _{DD}	"	D03	"	"	"	"

1/ Pins not designated may be high level logic, low level logic, or open. Exceptions are as follows: V_I(P0S) tests, the V_{SS} terminal shall be open; V_C(req) tests, the V_{DD} terminal shall be open; I_S tests, D0 and DB terminals shall be open.

2/ Leakage current tests (I_S, I_L, I_H, and I_Z) subgroup 3, are not required for

3/ 100 percent screening (final electricals).

3/ Perform a functional test using the test pattern and expected outputs shown below. Input levels shall be 0 = V_{SS} and 1 = V_{DD}. Output levels shall be V_{OL} = V_{SS}-0.50 V max and V_{OH} = V_{DD}-0.5 V min.

DEVICE TYPE 01

Name	Pin no.	TIME SLOT:																																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
CS	15	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
MRD	10	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1		
DI ₀	1	1	1	1	0	1	0	0	1	1	0	1	1	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0		
DI ₁	2	1	1	1	1	0	0	1	0	0	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0		
DI ₂	7	1	1	1	1	0	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0		
DI ₃	9	1	1	1	1	0	0	0	0	1	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0		
		INPUT				OUTPUT																									INPUT					
DB ₀	14	0	0	0	1	0	1	0	0	0	1	1	1	0	1	1	0	1	0	0	1	1	0	0	0	1	1	1	0	1	1	0	1	0	0	1
DB ₁	13	0	0	0	1	0	0	1	0	0	1	1	0	1	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	1	0	1	
DB ₂	12	0	0	0	1	0	0	0	1	0	1	1	0	1	1	0	0	1	1	0	0	1	0	1	0	1	1	0	0	1	1	1	0	0	1	
DB ₃	11	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	1	1	1	0	0	0	1	0	1	1	0	0	0	1	1	1	1	1		
DO ₀	3	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	1	0	0	0	1	1	1	0	1	1	0	0	1	0	0	0	1
DO ₁	4	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	0	1	0	0	1	1	0	1	0	1	0	1	0	1	0	0	1
DO ₂	5	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	0	0	1	0	1	0	1	1	0	0	1	1	1	0	1	1	
DO ₃	6	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	1	1	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1

DEVICE TYPE 02

Name	Pin no.	TIME SLOT:																																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
CS	15	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
MRD	10	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
DI ₀	1	1	1	1	0	1	0	0	1	1	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0		
DI ₁	2	1	1	1	1	0	0	1	0	0	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0			
DI ₂	7	1	1	1	1	0	0	0	0	0	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0			
DI ₃	9	1	1	1	1	0	0	0	0	1	0	1	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0			
		INPUT				OUTPUT																								INPUT							
DB ₀	14	0	0	0	1	0	1	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1	1	0	0	0	1	0	0	1	0	1	1	1			
DB ₁	13	0	0	0	1	0	0	1	0	1	1	0	0	1	0	1	0	1	1	0	0	1	1	1	0	1	0	1	0	1	0	1	1	1			
DB ₂	12	0	0	0	1	0	0	0	1	0	1	1	0	1	1	0	0	1	1	0	1	0	1	0	1	0	0	1	0	0	1	1	0	1			
DB ₃	11	0	0	0	1	0	0	0	0	1	0	1	1	0	0	1	0	1	1	0	1	0	0	0	1	1	1	1	0	0	1	1	0	0	1		
DO ₀	3	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	1	1	1	0	0	0	1	1	0	1	1	1	1			
DO ₁	4	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	1	0	1	1	0	0	1	0	0	1	0	1	0	1	0	1
DO ₂	5	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	1	1	0	1	0	0	1	0	0	1	1	0	1	1	0	1
DO ₃	6	X	X	0	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0	1	1	0	1	0	0	0	1	1	1	1	0	0	0	1	

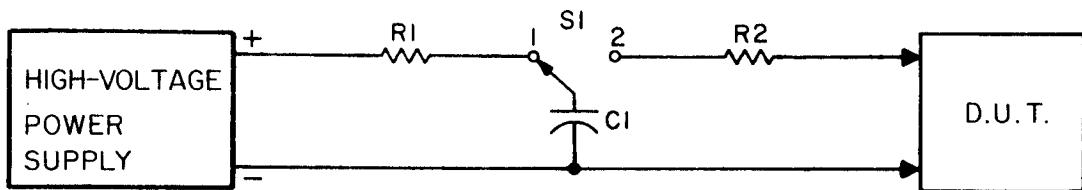
X = DENOTES HIGH IMPEDANCE STATE.

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.

4.5.2 High voltage (V_{ZAP}) test of input protection circuits. Unless otherwise specified, all input terminals (up to a maximum of four) of the device under test (DUT), shall be subjected to a voltage pulse from a 100 pF source charged to 400 V. This destructive test shall be conducted as follows using the test circuit on figure 6.

- a. Measure I_{IL} and I_{IH} at the inputs selected, as stated above, at 25°C and $V_{DD} = 13\text{ V}$. Also measure I_{SS} at 25°C and $V_{DD} = 13\text{ V}$. These measurements shall be made in accordance with table III. The test limit for a single terminal measurement of I_{IL} and I_{IH} shall be 500 nA maximum.



NOTES:

1. $V_{ZAP} = 400\text{ V}$ minimum charge on C_1
 $10\text{ m}\Omega \leq R_1 \leq 50\text{ M}\Omega$.
2. $R_2 = 1.5\text{ k}\Omega$.
3. $C_1 = 100\text{ pF}$
4. S_1 = Hg-wetter "bounceless" relay.

FIGURE 6. High voltage (V_{ZAP}) test circuit.

- b. With S_1 in position 1, charge C_1 to 400 V. With S_1 in position 2 apply the test voltage (V_{ZAP}) to the same terminal selected for leakage current measurements. Apply V_{ZAP} in a three pulse sequence as follows:

- (1) Input (-) to V_{DD}
- (2) Input (+) to V_{SS}
- (3) Input (+) to output

- c. Within 24 hours repeat the I_{SS} , I_{IL} and I_{IH} measurements on the same terminals as performed above. At this time a DUT exhibiting leakage currents in excess of the specified limits is defective.

4.6 Data reporting. When specified in the acquisition document, a copy of the following data, as applicable, shall be supplied.

- a. Attributes data for all screening tests (see 4.2) and variables data for all dynamic burn-in, and steady state life tests (see 4.4.3).
- b. The quality conformance inspection data (see 4.4).
- c. Final electrical parameters data (see 4.2c).

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510. These devices require electrostatic protection.

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 original equipment design applications and 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 failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action and reporting of results, if applicable.
- f. Requirements for product assurance options.
- g. 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-	- - - - -	Ground. Zero voltage potential.
TA	- - - - -	Free air temperature.
t _{THL}	- - - - -	Fall time. Time duration which the amplitude of the trailing edge of the input forcing condition or waveform is decreasing from 90 to 10 percent of the maximum amplitude.
t _{T LH}	- - - - -	Rise time. Time duration during which the amplitude of the leading edge of the input forcing condition or waveform is increasing from 10 to 90 percent of the maximum amplitude.
V _{DD}	- - - - -	Positive supply voltage.
V _{SS}	- - - - -	Negative supply voltage.
I _{SS}	- - - - -	Quiescent supply current.

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 herein 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	1856
02	1857

6.8 Handling. CMOS devices should be handled with certain precautions to avoid damage due to accumulation of static charge. Input protection devices have been designed in the ship to minimize the effect of this static buildup. However, the following handling practices are recommended:

- a. Devices should be handled on benches with conductive and grounded surfaces.
- b. Ground test equipment and tools.
- c. Do not handle devices by the leads.
- d. Store devices in conductive carriers or conductive foam.
- e. Avoid use of plastic, rubber, or silk in areas where CMOS devices are handled.
- f. Maintain relative humidity above 50 percent, if practical.

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

6.10 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.

Custodian:
NASA - NA

Preparing activity:
NASA - NA

Review activity:
DLA - ES

(Project 5962-K646-5)

Agent:
DLA - ES