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Defense Electronics Supply Center Dayton, Ohio	PREPARED BY Ray Monnin	**MILITARY DRAWING** This drawing is available for use by all Departments and Agencies of the Department of Defense
	CHECKED BY DCA DiCenzo	
Original date of drawing: 19 January 1988	APPROVED BY [signature]	TITLE: MICROCIRCUITS, DIGITAL, HMOS, MULTI-PROTOCOL, SERIAL CONTROLLER, MONOLITHIC SILICON
	SIZE A / CODE IDENT. NO. 67268	DWG NO. 5962-87713
AMSC N/A	REV	PAGE 1 OF 14

5962-E600

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

DESC FORM 193
MAY 86

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:

5962-87713	01	Q	X
Drawing number	Device type (1.2.1)	Case outline (1.2.2)	Lead finish per MIL-M-38510

1.2.1 Device type. The device type shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	8274	Multi-protocol serial controller

1.2.2 Case outline. The case outline shall be as designated in appendix C of MIL-M-38510, and as follows:

Outline letter	Case outline
Q	D-5 (40-lead, 9/16" x 2 1/16"), dual-in-line package

1.3 Absolute maximum ratings.

Supply voltage V_{CC}	4.5 V dc to 5.5 V dc
Voltage on any pin with respect to ground	-0.5 V dc to +7.0 V dc
Storage temperature range	-65°C to +150°C
Power dissipation (P_D)	1.5 W
Lead temperature (soldering, 10 seconds)	300°C
Thermal resistance, junction-to-case (θ_{JC})	See Mil-M-38510, appendix C
Junction temperature (T_J)	200°C

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	4.5 V dc to 5.5 V dc
Minimum high-level input voltage (V_{IH})	+2.2 V dc
Maximum high-level input voltage (V_{IH})	+V_{CC} +0.5 V dc
Minimum low-level input voltage (V_{IL})	-0.5 V dc
Maximum low-level input voltage (V_{IL})	+0.8 V dc
Case operating temperature range (T_C)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specification and standard. Unless otherwise specified, the following specification and standard, of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of the specification and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

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

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 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 Block diagram. The block diagram shall be as specified on figure 2.

3.2.3 Case outline. The case outline shall be in accordance with 1.2.2 herein.

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

3.4 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in 6.4 herein.

3.5 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in 6.4. The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall state that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.6 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.7 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$ $4.5\ V \le V_{CC} \le 5.5\ V$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Input low voltage	V_{IL}	1/	1, 2, 3	-0.5	0.8	V
Input high voltage	V_{IH}	1/	1, 2, 3	2.2	V_{CC} +0.5	V
Output low voltage	V_{OL}	I_{OL} = 2.0 mA	1, 2, 3		0.45	V
Output high voltage	V_{OH}	I_{OH} = -200 µA	1, 2, 3	2.4		V
Input leakage current	I_{IL}	V_{IN} = V_{CC}(max) to 0 V (pin 10 is guaranteed but not tested)	1, 2, 3		±10	µA
Output float leakage current	I_{OFL}	V_{OUT} = V_{CC}(max) to 4.5 V data bus	1, 2, 3		±10	µA
V_{CC} supply current	I_{CC}	V_{CC} = 5.5 V	1, 2, 3		240	mA
Input capacitance	C_{IN}	See 4.3.1c	4		10	pF
Output capacitance	C_{OUT}	See 4.3.1c	4		15	pF
Input/output capacitance	$C_{I/O}$	See 4.3.1c	4		20	pF
Functional tests		See 4.3.1d	7,8			
Clock period	t_{CY}	2/	9,10,11	250	4000	ns
CLK low time	t_{CL}	2/	9,10,11	105	2000	ns
CLK high time	t_{CH}	2/	9,10,11	105	2000	ns
CLK rise time	t_r	1/ 2/	9,10,11	0	30	ns
Clock fall time	t_f	2/	9,10,11	0	30	ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$ $4.5\ V \le V_{CC} \le 5.5\ V$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
A_0, A_1 setup to $\overline{RD}$ neg. edge	t_{AR}	2/	9,10,11	0		ns
A_0, A_1 data output delay	t_{AD}	C_L = 150 pF 2/	9,10,11		200	ns
A_0, A_1 hold after $\overline{RD}$ neg. edge	t_{RA}	2/	9,10,11	70		ns
$\overline{RD}$ neg. edge to data output delay	t_{RD}	C_L = 150 pF 2/	9,10,11		245	ns
$\overline{RD}$ pulse width	t_{RR}	2/	9,10,11	250		ns
Output float delay	t_{DF}	2/	9,10,11		120	ns
$\overline{CS}$, A_0, A_1 setup to $\overline{WR}$ neg. edge	t_{AW}	2/	9,10,11	0		ns
$\overline{CS}$, A_0, A_1 hold after $\overline{WR}$ pos. edge	t_{WA}	2/	9,10,11	0		ns
$\overline{WR}$ pulse width	t_{WW}	2/	9,10,11	320		ns
Data setup to $\overline{WR}$ pos. edge	t_{DW}	2/	9,10,11		150	ns
Data hold after $\overline{WR}$ pos. edge	t_{WD}	2/	9,10,11	0		ns
$\overline{IPI}$ setup top $\overline{INTA}$ neg. edge	t_{PI}	2/	9,10,11	0		ns
$\overline{IPI}$ hold after $\overline{INTA}$ pos. edge	t_{IP}	2/	9,10,11	10		ns
$\overline{INTA}$ pulse width	t_{II}	2/	9,10,11	250		ns
$\overline{IPI}$ neg. edge to $\overline{IPO}$ delay	t_{PIPO}	2/	9,10,11		100	ns
$\overline{INTA}$ neg. edge to data output delay	t_{ID}	2/	9,10,11		245	ns

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$, $4.5\ V \le V_{CC} \le 5.5\ V$, unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
$\overline{RD}$ or $\overline{WR}$ to DRQ neg. edge	t_{CQ}	2/	9,10,11		150	ns
Recovery time between controls	t_{RV}	2/	9,10,11	300		ns
$\overline{CS}$, A_0, A_1 to RDY_A or RDY_B delay	t_{CW}	2/	9,10,11		140	ns
Data clock cycle	t_{DCY}	2/	9,10,11	4.5		t_{CY}
Data clock low time	t_{DCL}	2/	9,10,11	180		ns
Data clock high time	t_{DCH}	2/	9,10,11	180		ns
$\overline{TxC}$ to TxD delay	t_{TD}	2/	9,10,11		300	ns
RxD setup to $\overline{RxC}$ pos. edge	t_{DS}	2/	9,10,11	0		ns
RxD hold after $\overline{RxC}$ pos. edge	t_{DH}	2/	9,10,11	140		ns
$\overline{TxC}$ to $\overline{INT}$ delay	t_{ITD}	1/ 2/	9,10,11	4	6	t_{CY}
RxC to $\overline{INT}$ delay	t_{IRD}	1/ 2/	9,10,11	7	10	t_{CY}
$\overline{CTS}$, $\overline{CD}$, $\overline{SYNDET}$ low time	t_{PL}	2/	9,10,11	200		ns
$\overline{CTS}$, $\overline{CD}$, $\overline{SYNDET}$ high time	t_{PH}	2/	9,10,11	200		ns
Ext. $\overline{INT}$ from $\overline{CTS}$, $\overline{CD}$, $\overline{SYNDET}$	t_{IPD}	2/	9,10,11		500	ns

1/ Guaranteed if not tested.
2/ AC test conditions (See figure 3):
Input high level: $V_{IH} = 2.4\ V$
Input low level: $V_{IL} = 0.45\ V$
Output voltage high: $V_{OH} = 2.0\ V$
Output voltage low: $V_{OL} = 0.8\ V$
Input rise/fall times: $t_r/t_f < 10.0$ ns
Timing measurements are made at 2.0 V for logic "1" and 0.8 V for logic "0".
Output load = 100 pF including test jig.

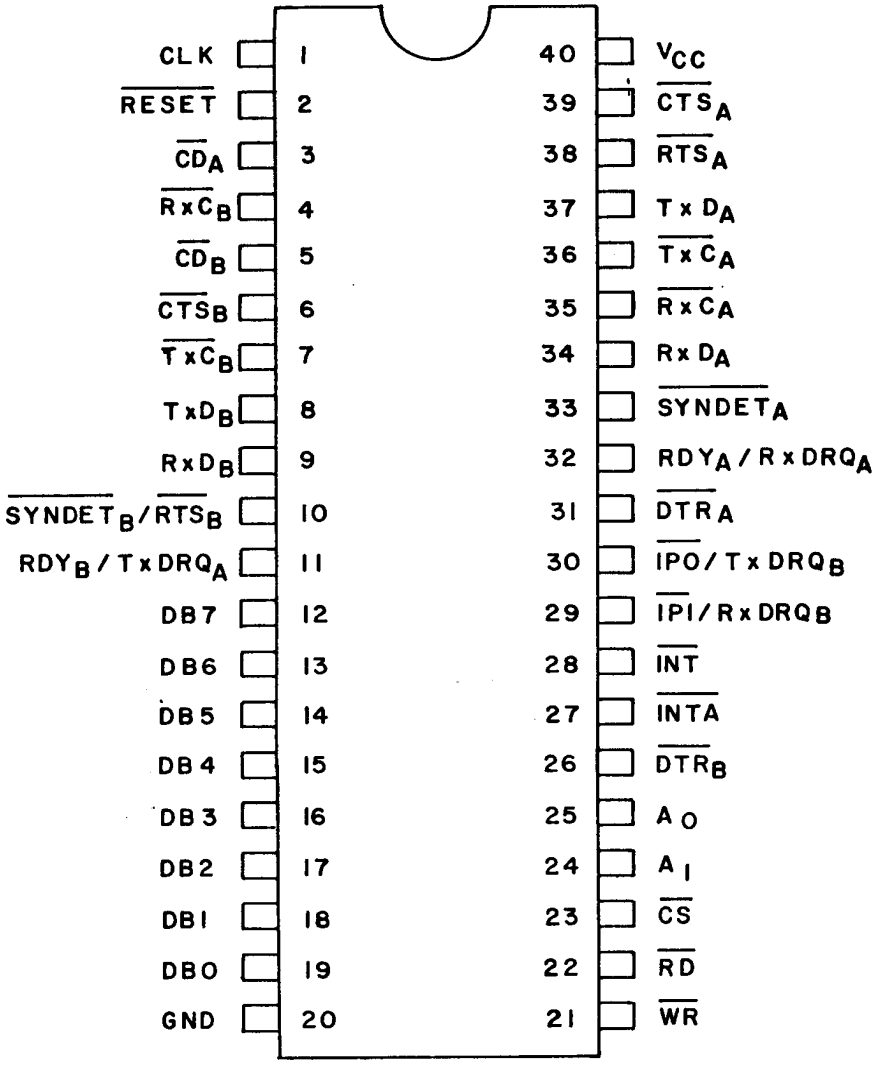

FIGURE 1. Terminal connections.

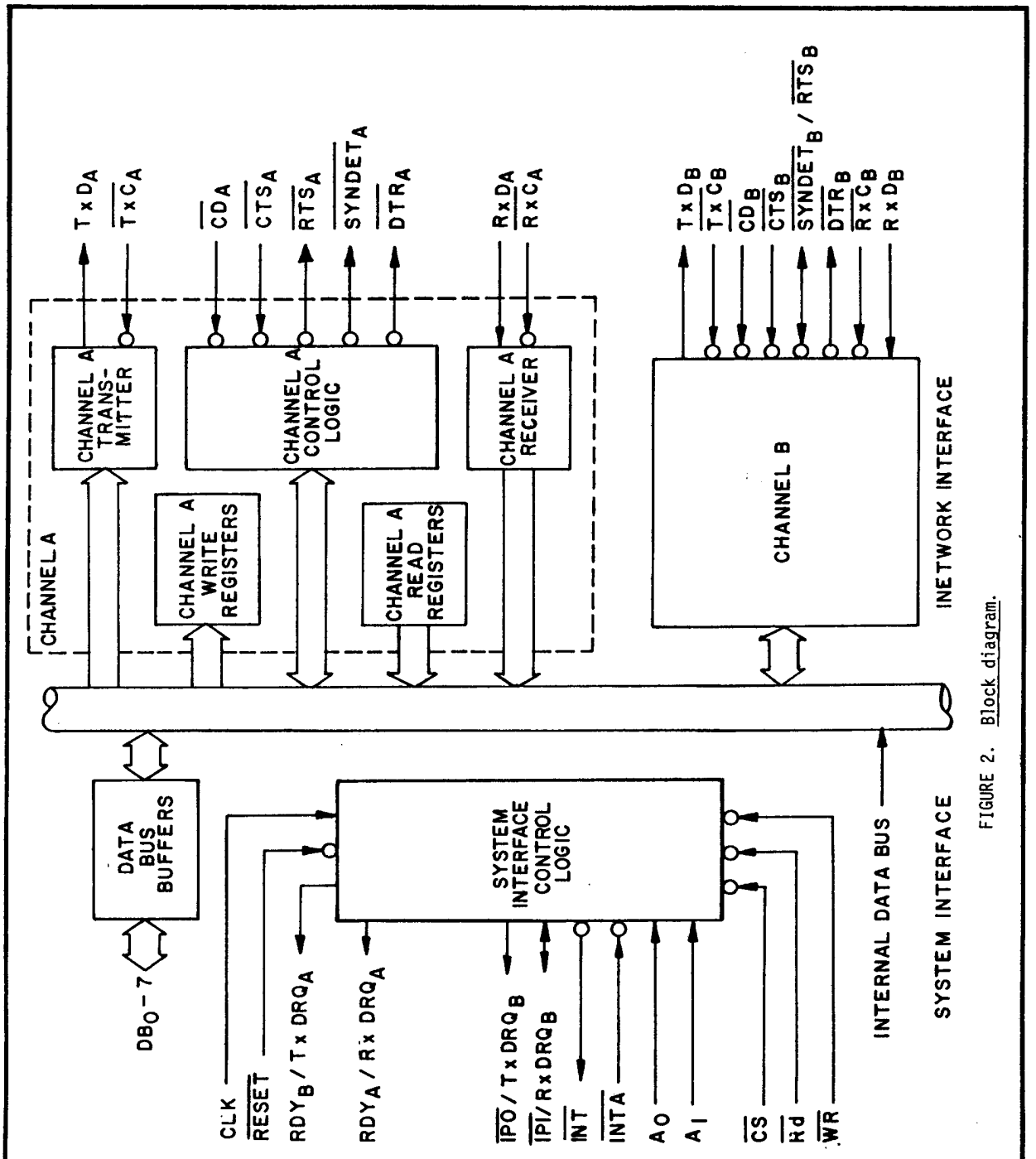

FIGURE 2. Block diagram.

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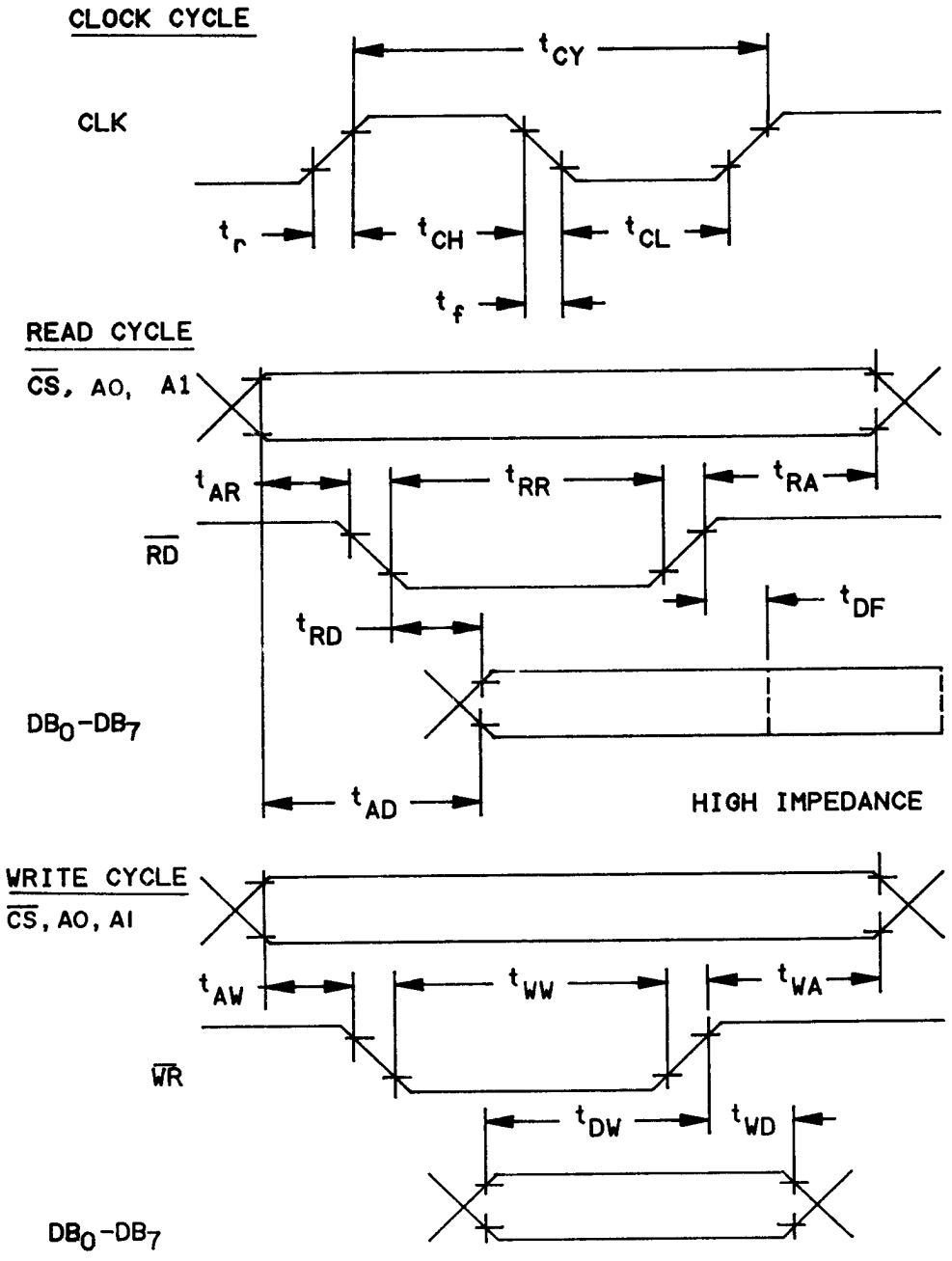
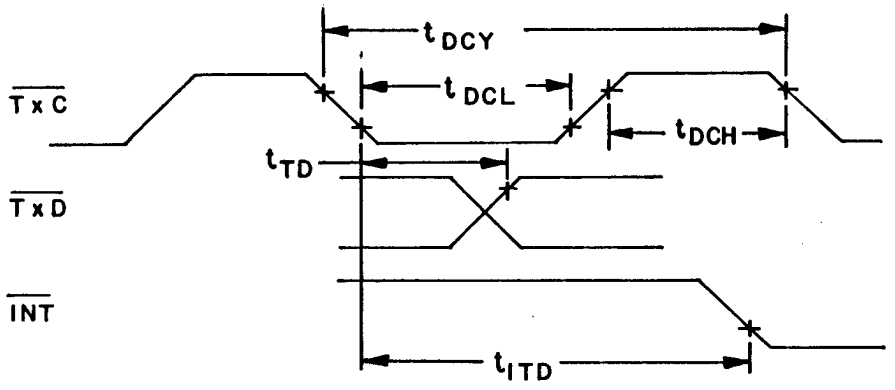
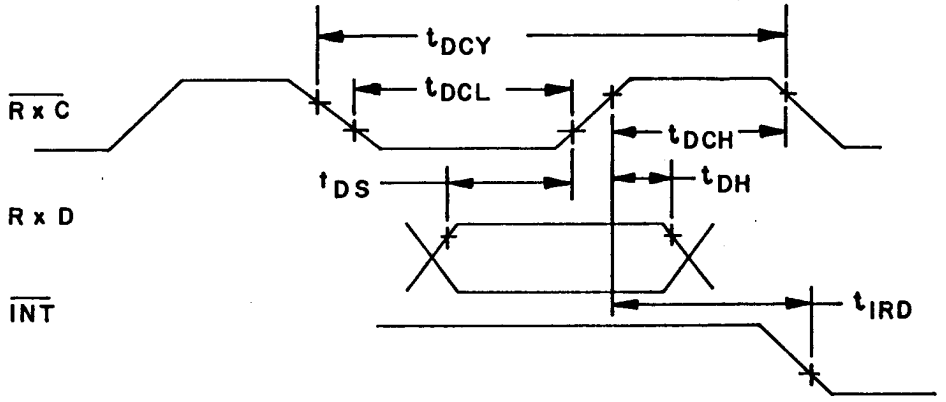


FIGURE 3. Timing diagram.

TRANSMIT DATA CYCLE



RECEIVE DATA CYCLE



OTHER TIMING

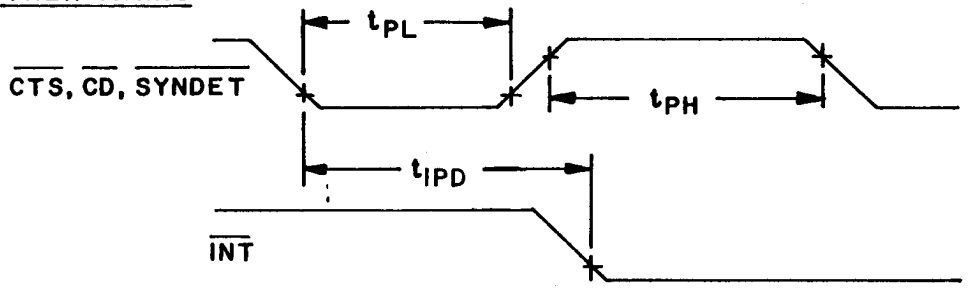


FIGURE 3. Timing diagram - Continued.

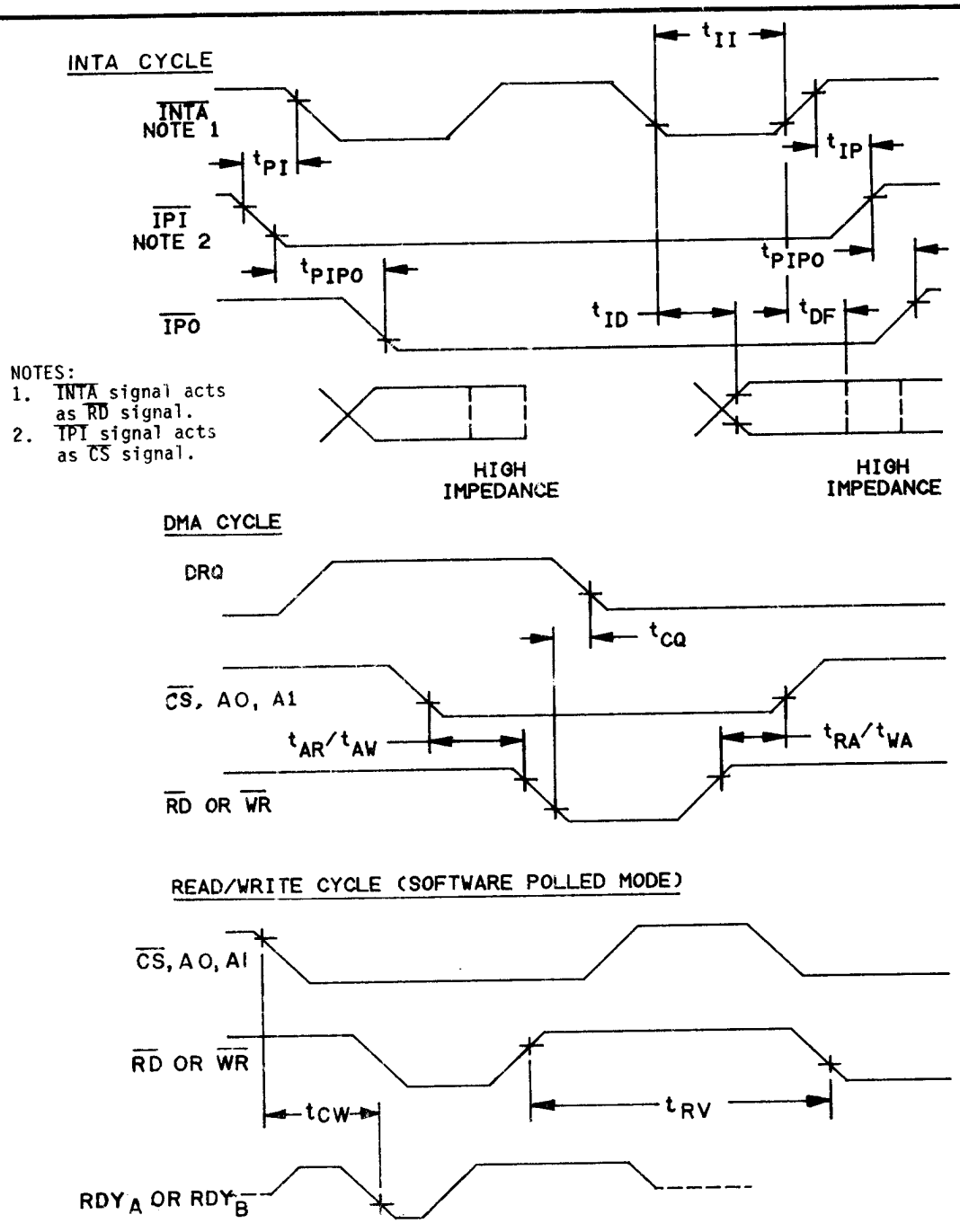


FIGURE 3. Timing diagram - Continued.

3.8 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

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

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

(1) Test condition A, B, C or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(2) T_A = +125°C, minimum.

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

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

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

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

c. Subgroup 4 (C_{IN}, C_{OUT} and $C_{I/O}$ measurements) shall be measured only for the initial test and after process or design changes which may affect capacitance.

d. Subgroups 7 and 8 tests shall verify the instruction set. The instruction set forms a part of the vendors test tape and shall be maintained and available from the approved sources of supply.

4.3.2 Groups C and D inspections.

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

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

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance.

(2) T_A = +125°C, minimum.

(3) Test duration: 1,000 hours, except as permitted by appendix B of MIL-M-38510 and method 1005 of MIL-STD-883.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*,2,3,7,8, 9,10,11
Group A test requirements (method 5005)	1,2,3,7,8, 9,10,11
Groups C and D end-point electrical parameters (method 5005)	2,8(hot),10
Additional electrical subgroups for group C periodic inspections	---

* PDA applies to subgroup 1.

5. PACKAGING

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

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

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

6.4 Approved source of supply. An approved source of supply is listed herein. Additional sources will be added as they become available. The vendor listed herein has agreed to this drawing and a certificate of compliance (see 3.5 herein) has been submitted to DESC-ECS.

Military drawing part number	Vendor CAGE number	Vendor similar part number 1/	Replacement military specification part number
5962-8771301QX	34649	MD8274/B	

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

Vendor CAGE number	Vendor name and address
34649	Intel Corporation 5000 W. Williams Field Road Chandler, AZ 85224