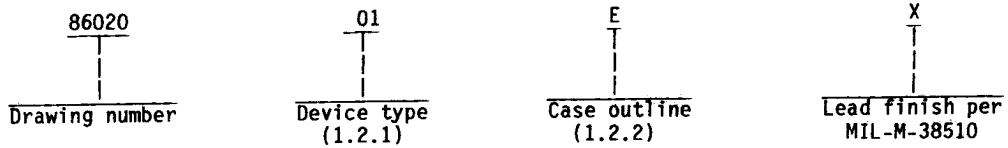


1. SCOPE

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:



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

Device type	Generic number	Circuit	Access time
01	27LS00	256-bit low power Schottky bipolar RAM three-state	55 ns
02	27LS00A	256-bit low power Schottky bipolar RAM three-state	45 ns
03	27LS01	256-bit low power Schottky bipolar RAM open collector	55 ns
04	27LS01A	256-bit low power Schottky bipolar RAM open collector	45 ns

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

Outline letter	Case outline
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.

Supply voltage range - - - - -	-0.5 V dc to +7.0 V dc
Input voltage range - - - - -	-0.5 V dc to +5.5 V dc
Storage temperature range - - - - -	-65°C to +150°C
Maximum power dissipation (P _D) 1/ - - - - -	1.6 W
Lead temperature (soldering, 10 seconds) - - - - -	+300°C
Thermal resistance, junction-to-case (θ _{JC}):	
Case E - - - - -	(See MIL-M-38510, appendix C)
Case F - - - - -	(See MIL-M-38510, appendix C)
Junction temperature (T _J) - - - - -	+175°C
Output current, inputs - - - - -	30 mA
DC input current - - - - -	-30 mA to +5 mA

1.4 Recommended operating conditions.

Supply voltage (V _{CC}) - - - - -	4.5 V dc minimum to 5.5 V dc maximum
Minimum high-level input voltage (V _{IN}) - - - - -	2.0 V dc
Maximum low-level input voltage (V _{IL}) - - - - -	0.8 V dc
Case operating temperature range (T _C) - - - - -	-55°C to +125°C

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

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
	REV A	PAGE 2	

DESC FORM 193A
FEB 86

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 Truth table. The truth table shall be as specified on figure 2.

3.2.3 Logic diagrams. The logic diagrams shall be as specified on figure 3.

3.2.4 Case outlines. The case outlines shall be in accordance with 1.2.2.

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.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 3

DESC FORM 193A
FEB 86

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C 4.5 V ≤ V _{CC} ≤ 5.5 V	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Output high voltage	V _{OH}	V _{CC} = minimum V _{IN} = V _{IH} or V _{IL} I _{OH} = -2.0 mA	1, 2, 3	01, 02	2.4		V
Output low voltage	V _{OL}	V _{CC} = minimum V _{IN} = V _{IH} or V _{IL} I _{OL} = 16 mA	1, 2, 3	A11		0.45	V
Input high level	V _{IH}	Guaranteed input logical high voltage for all inputs <u>1/</u>	1, 2, 3	A11	2.0		V
Input low level	V _{IL}	Guaranteed input logical low voltage for all inputs <u>1/</u>	1, 2, 3	A11		0.8	V
Input low current	I _{IL}	V _{CC} = maximum V _{IN} = 0.4 V	1, 2, 3	A11		-0.25	mA
Input high current	I _{IH}	V _{CC} = maximum V _{IN} = 2.7 V	1, 2, 3	A11		20	μA
Output short circuit current	I _{OS}	V _{CC} = maximum V _{OUT} = 0.0 V	1, 2, 3	01, 02	-20	-60	mA
Power supply current	I _{CC}	All inputs = GND V _{CC} = Maximum	1, 2, 3	02, 04 01, 03		115 70	mA
Input clamp voltage	V _{CL}	V _{CC} = Minimum, I _{IN} = -18 mA	1, 2, 3	A11		-1.2	V
Output leakage current	I _{CEX}	V _{CS} = V _{IH} or V _{WE} = V _{IL} V _{OUT} = 2.4 V	1, 2, 3	A11		30	μA
		V _{CS} = V _{IH} or V _{WE} = V _{IL} V _{OUT} = 0.4 V V _{CC} = maximum	1, 2, 3	01, 02	-30		μA

See footnote at end of table.

MILITARY DRAWING
DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO

SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
	REV A	PAGE 4

DESC FORM 193A
FEB 86

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C ≤ T _C ≤ +125°C 4.5 V ≤ V _{CC} ≤ 5.5 V	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Delay from address to output	t _{PLH} (A) t _{PHL} (A)	See figure 4 2/ 3/ 4/	9, 10, 11	01, 03		55	ns
				02, 04		45	
Delay from chip select (low) to active output and correct data	t _{PZH} (CS) 5/ t _{PZL} (CS) 5/		9, 10, 11	01, 03		30	ns
				02, 04		25	
Delay from write enable (high) to active output and correct data	t _{PZH} (WE) 5/ t _{PZL} (WE) 5/	See figures 4, 5, and 6 2/ 3/ 4/	9, 10, 11	01, 03		55	ns
				02, 04		45	
				01, 03		55	
				02, 04		45	
Setup time address (prior to initiation of write)	t _S (A)		9, 10, 11	A11	5		ns
Hold time address (after termina- tion of write)	t _H (A)		9, 10, 11	A11	5		ns
Setup time data input (prior to termination of write)	t _S (DI)		9, 10, 11	01, 03	35		ns
				02, 04	30		ns
Hold time data input (after termination of write)	t _H (DI)		9, 10, 11	A11	5		ns
Minimum write enable pulse width to insure write	t _{PW} (WE)		9, 10, 11	01, 03	35		ns
				02, 04	30		ns

See footnotes at end of table.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 5

DESC FORM 193A
FEB 86

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C < T _C < +125°C 4.5 V < V _{CC} < 5.5 V	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Delay from chip select (high) to inactive output (HI-Z)	t _{PHZ} (CS)	See figure 4 2/ 3/ 4/	9, 10, 11	01, 03		30	ns
	t _{PLZ} (CS)			02, 04		25	ns
Delay from write enable (low) to inactive output (HI-Z)	t _{PLZ} (WE)		9, 10, 11	A11		40	ns
	t _{PHZ} (WE)						

- 1/ These are absolute voltages with respect to device ground pin and include all overshoots due to system or tester noise, or both. Do not attempt to test these values without suitable equipment.
- 2/ Output is preconditioned to data in during write to ensure correct data is present on all outputs when write is terminated. (No write recovery glitch).
- 3/ t_{PLH}(A) and t_{PHL}(A) are tested with S closed and C_L = 50 pF with both input and output timing referenced to 1.5 V.
- 4/ For open collector (03, 04), all delays from write enable (WE) or chip select (CS) inputs to the data output (D_{OUT}), t_{PLZ}(WE), t_{PLZ}(CS), t_{PZL}(WE), and t_{PZL}(CS) are measured with S closed and C_L = 50 pF and with both the input and output timing referenced to 1.5 V.
- 5/ For three-state output (01, 02) t_{PZH}(WE) and t_{PZH}(CS) are measured with S open, C_L = 50 pF and with both the input and output timing referenced to 1.5 V. t_{PZL}(WE) and t_{PZL}(CS) are measured with S closed, C_L = 50 pF and with both the input and output timing referenced to 1.5 V. t_{PHZ}(WE) and t_{PHZ}(CS) are measured with S open and C_L < 5 pF and are measured between the 1.5 V level on the input to the V_{OH} -500 mV level on the output. t_{PLZ}(WE) and t_{PLZ}(CS) are measured with S closed and C_L < 5 pF and are measured between the 1.5 V level on the input and the V_{OL} +500 mV level on the output.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 6

DESC FORM 193A
FEB 86

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

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) $T_A = +125^\circ\text{C}$, 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 4, 5, and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 4 (C_{IN} measurement) shall be measured only for the initial test and after process or design changes which may affect input capacitance.

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 (see 3.5 herein).

(2) $T_A = +125^\circ\text{C}$, minimum.

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

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 7

DESC FORM 193A
FEB 86



Cases E and F

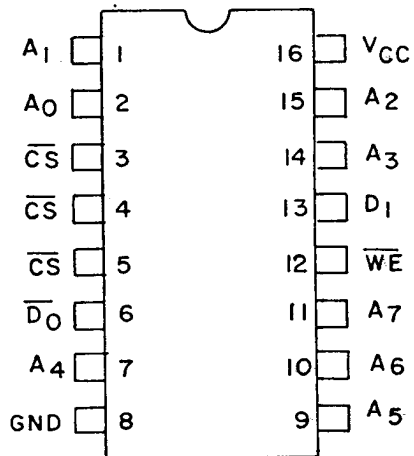


FIGURE 1. Terminal connections.

Input			Data output	Mode
CS	WE	D1	Status D0 ($t_n + 1$)	
H	X	X	Output disabled	No selection
L	L	L	Output disabled	Write '0'
L	L	H	Output disabled	Write '1'
L	H	X	Selected bit (inverted)	Read

H = High
 L = Low
 X = Don't care

FIGURE 2. Truth table.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 8

DESC FORM 193A
 FEB 86



Device types 01 and 02

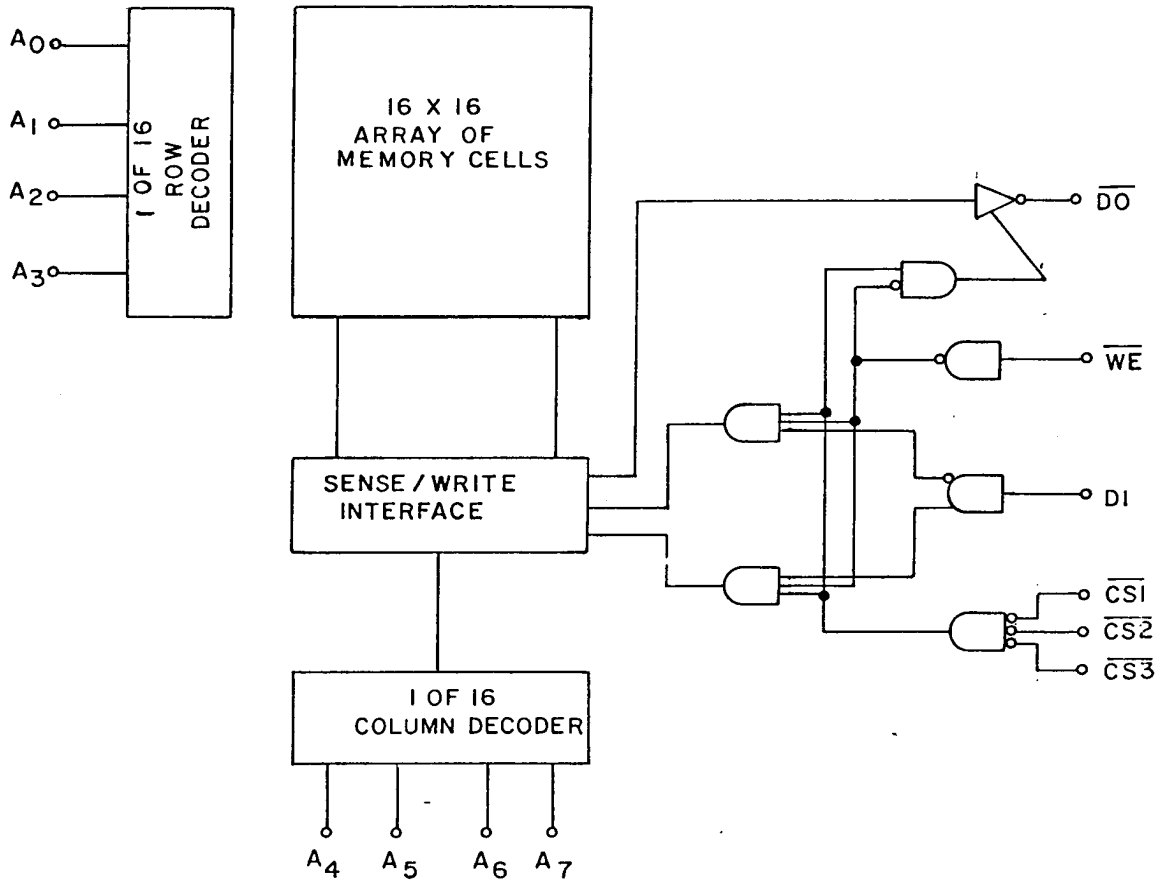


FIGURE 3. Logic diagrams.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 9

DESC FORM 193A
FEB 86

Device types 03 and 04

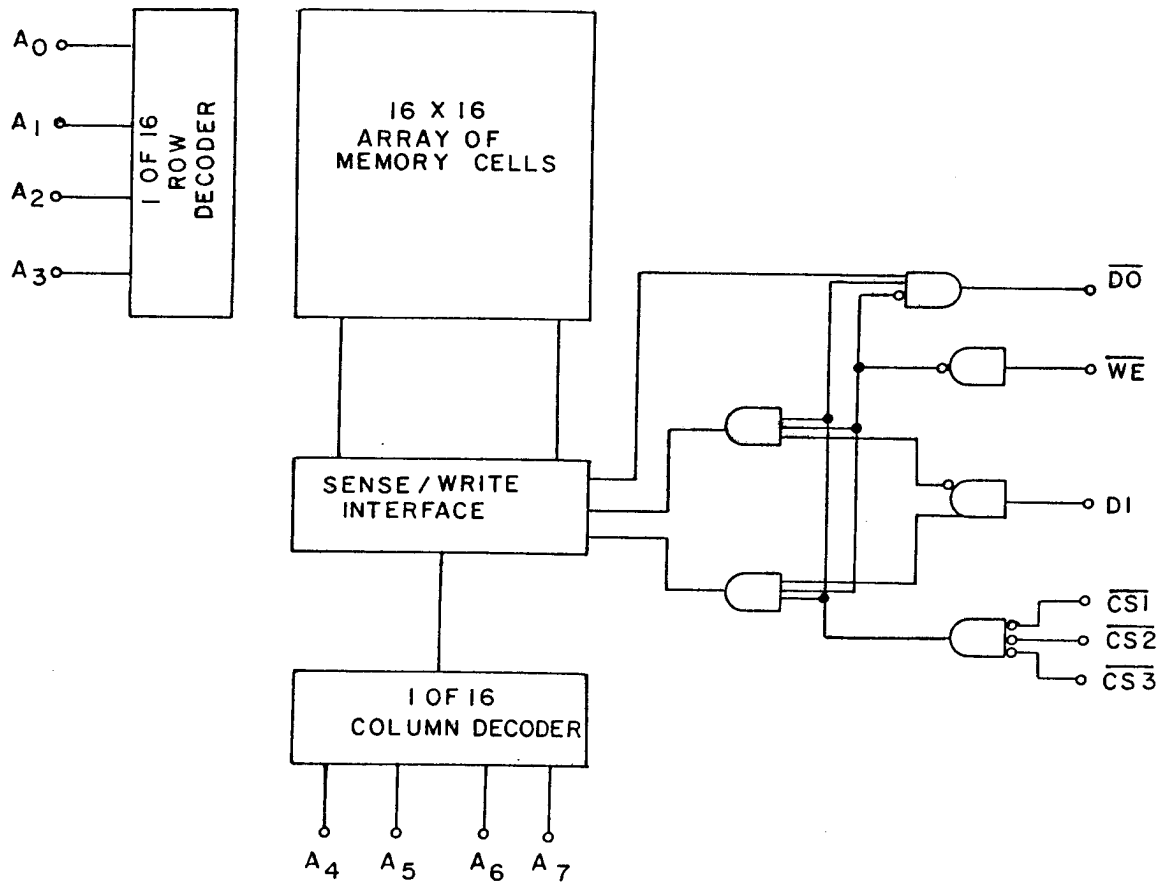


FIGURE 3. Logic diagrams - Continued.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 10

DESC FORM 193A
FEB 86

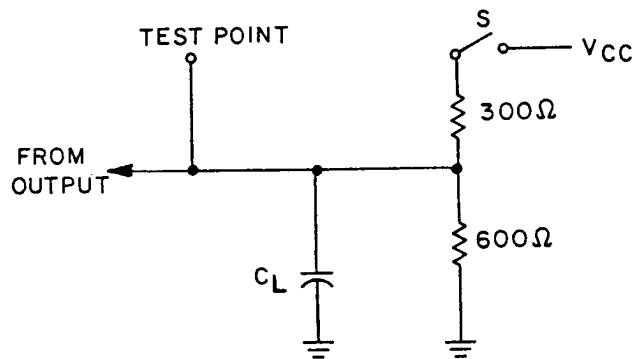


FIGURE 4. Switching test circuit.

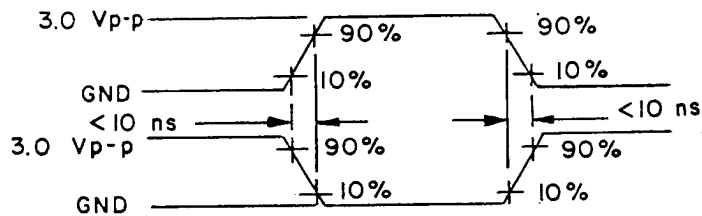
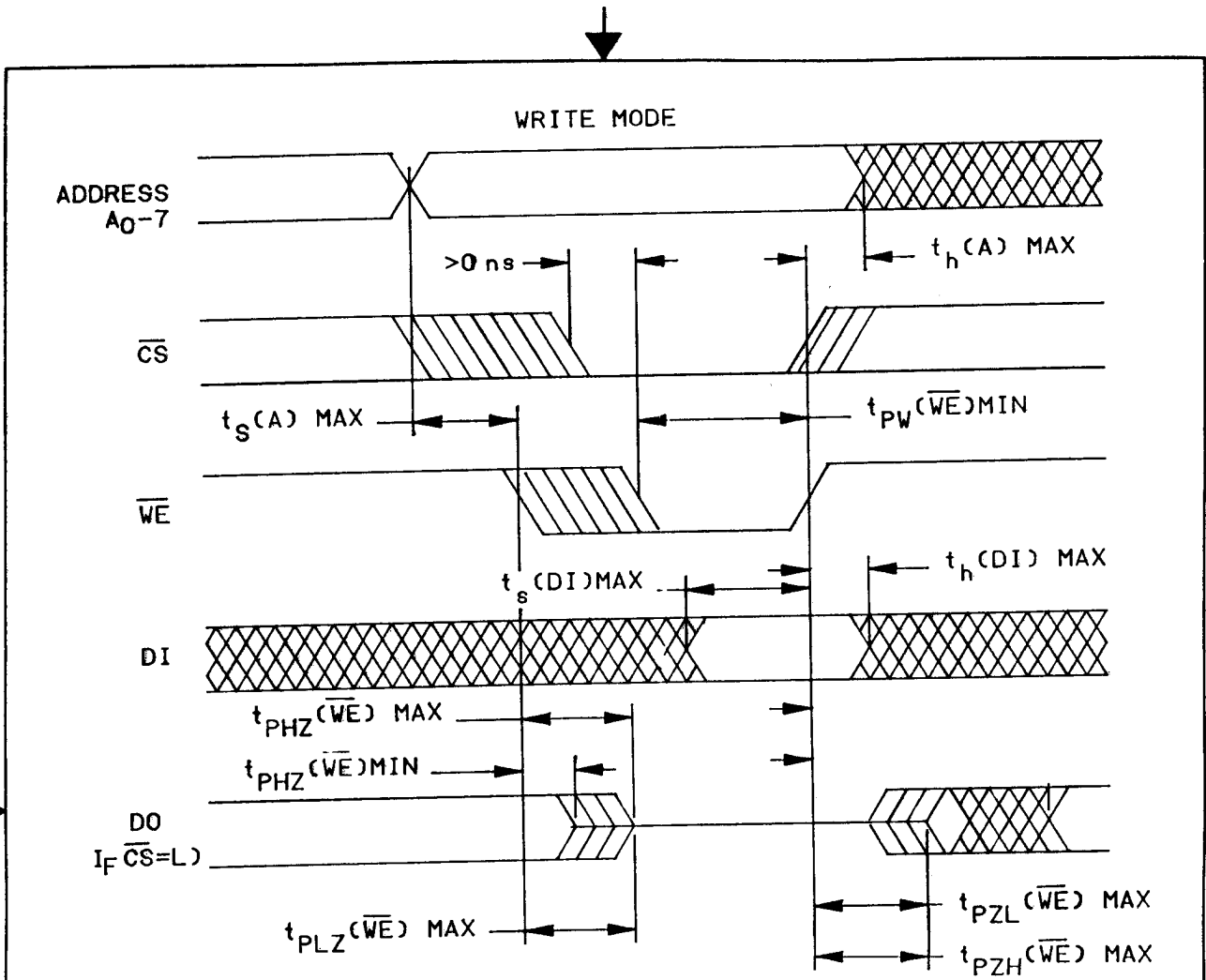


FIGURE 5. Switching test waveform.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE	CODE IDENT. NO.	DWG NO.
	A	14933	86020
	REV	A	PAGE 11

DESC FORM 193A
FEB 86

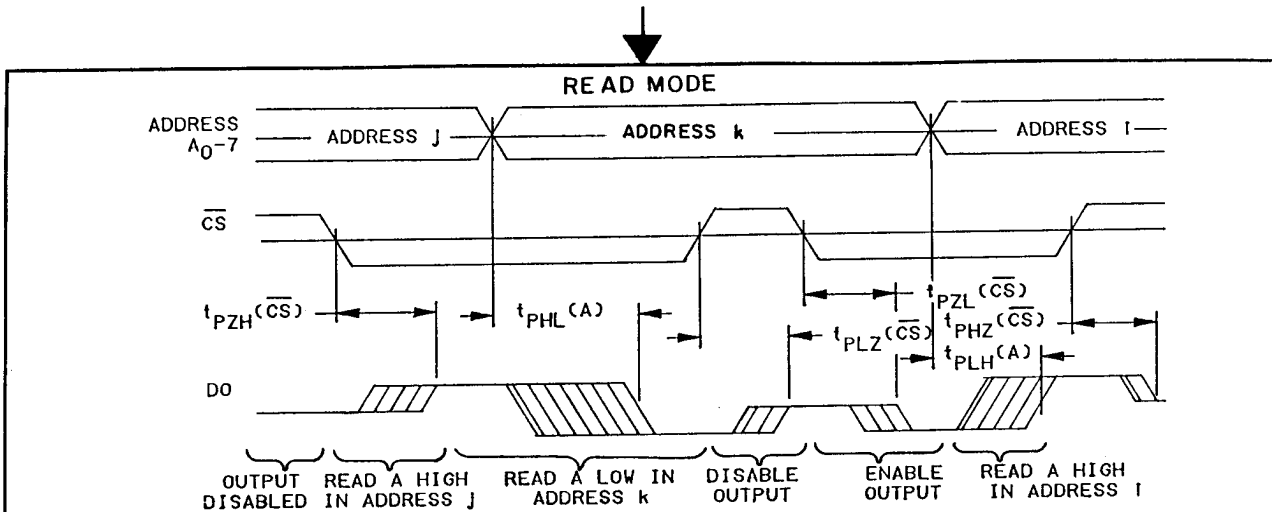


Write Cycle Timing. The cycle is initiated by an address change. After $t_s(A) \text{ max}$, the write enable may begin. The chip select must also be LOW for writing. Following the write pulse, $t_h(A) \text{ max}$ must be allowed before the address may be changed again. The output will be inactive (floating for device types 01 and 02) while the write enable is LOW. Ordinarily, the chip select should be LOW during the entire write pulse.

FIGURE 6. Switching waveforms.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 12

DESC FORM 193A
FEB 86



Switching delays from address and chip select inputs to the data output. For devices 01 and 02, disabled output is "OFF", represented by a single center line. For devices 03 and 04 a disabled output is HIGH.

Key to switching waveforms

WAVEFORM	INPUT	OUTPUT
	MUST BE STEADY	WILL BE STEADY
	MAY CHANGE FROM H TO L	WILL BE CHANGING FROM H TO L
	MAY CHANGE FROM L TO H	WILL BE CHANGING FROM L TO H
	DON'T CARE: ANY CHANGE PERMITTED	CHANGING STATE UNKNOWN
	DOES NOT APPLY	CENTER LINE IS HIGH IMPEDANCE "OFF" STATE

FIGURE 6. Switching waveforms - Continued.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 13

DESC FORM 193A
FEB 86

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)	1, 2, 3
Additional electrical subgroups for group C periodic inspections	---

* PDA applies to subgroup 1.
 ** Subgroups 10 and 11, if not tested, shall be guaranteed to the specified limits in table I. Subgroups 7 and 8 shall consist of verifying the truth table specified on figure 2.

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.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 14

DESC FORM 193A
FEB 86

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 <u>1/</u>	Replacement military specification part number
8602001EX	34335	AM27LS00/BEA	---
8602001FX	34335	AM27LS00/BFA	---
8602002EX	34335	AM27LS00A/BEA	---
8602002FX	34335	AM27LS00A/BFA	---
8602003EX	34335	AM27LS01/BEA	---
8602003FX	34335	AM27LS01/BFA	---
8602004EX	<u>2/</u>	AM27LS01A/BEA	---
8602004FX	<u>Z/</u>	AM27LS01A/BFA	---

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

2/ Not available from an approved source of supply.

Vendor CAGE number

34335

Vendor name and address

Advanced Micro Devices, Incorporated
 901 Thompson Place
 P. O. Box 3453
 Sunnyvale, CA 94088

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 86020
		REV A	PAGE 15

DESC FORM 193A
 FEB 86