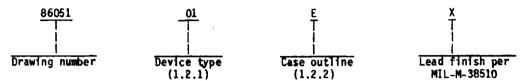
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В	and (Chang	Update vendor's part number. Change to military drawing format. 1987 JULY 7 Editorial changes throughout. Made technical changes to table I. Added device types 07, 08, and 09 for vendor CAGE 34335. Changes to figures 4, 5, and 6. Changes to 4.3.2 and 6.4. Corrected CAGE code on front page. Editorial changes throughout.									13		I.a.	P	r											
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SCOPE

- 1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with $1.\overline{2.1}$ 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	27502	64-Bit Schottky bipolar RAM, open collector outputs	50
02	27S02A	64-Bit Schottky bipolar RAM, open collector outputs	30
03	27LS02	64-Bit Low power schottky bipolar RAM, open collector outputs	65
04	27503	64-Bit Schottky bipolar RAM, three-state outputs	50
05	27S03A	64-Bit Schottky bipolar RAM, three-state outputs	30
06	27LS03	64-Bit Low power schottky bipolar RAM, three-state outputs	65
07	27502-20	64-Bit Schottky bipolar RAM, open collector outputs	20
08	27\$03-20	64-Bit Schottky bipolar RAM, three-state outputs	20
09		64-Bit Low power Schottky bipolar RAM, three-state outputs	30

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

 Dutline letter
 Case outline

 E
 D-2 (16-lead, .840" x .310" x .200"), dual-in-line package

 F
 F-5 (16-lead, .440" x .285" x .085"), flat package

 2
 C-2 (20-terminal, .358" x .358" x .100"), square chip carrier package

1.3 Absolute maximum ratings.

1/ Must withstand the added PD due to short circuit test; e.g., Ins.

STANDARDIZED

MILITARY DRAWING

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DAYTON, OHIO 45444

SIZE

A

86051

REVISION LEVEL
B

2

1.4 Recommended operating conditions.

- 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 <u>Truth table</u>. The truth table shall be as specified on figure 2.
 - 3.2. Logic diagram. The logic diagram shall be as specified on figure 3.
 - 3.2. Case outlines. The case outlines 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 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.

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TABLE I. Electrical performance characteristics. Group A sub-Limits Test Unit Symbol Device Conditions $-55^{\circ}\text{C} < T_{\text{C}} < +125^{\circ}\text{C}$ $4.5 \text{ V dc} < \text{V}_{\text{CC}} < 5.5 \text{ V dc}$ unless otherwise specified groups type Min Max Output high voltage νон VCC = min. 1,2,3 ALL 12.4 ٧ IVIN = VIH $I_{OH} = -2.0 \text{ mA}$ 01,02, 04,05, 07,08 V_{CC} = min. |V_{IN} = V_{IH} |or V_{IL} Output low voltage YOL $I_{OL} = 16 \text{ mA}$ 1,2,3 450 mΥ $I_{OL} = 20 \text{ mA}$ 101,02, 500 04,05, 107,08 | $I_{OL} = 10 \text{ mA}$ 103,06, 500 109 03,06, $I_{0L} = 8 \text{ mA}$ 450 09 Input high level Guaranteed input logical high 1/1,2,3 voltage for all inputs Vтн ٧ A11 12.0 voltage Input low level VIL Guaranteed input logical low voltage for all inputs A11 ٧ 1/|1,2,3 8.0 voltage V_{CC} = max V_{IN} = 0.40 V Input low current WE, DO-D3, I_{IL} 1,2,3 A11 -250 μΑ A₀-A₃, Input high current IIH $V_{CC} = \max_{i} V_{IN} = 2.7 \text{ V}$ 1,2,3 A11 10 μΑ Output short circuit $V_{CC} = \max_{V_{OUT} = 0.0 \text{ V } 2/$ -20 Ios 1,2,3 ALL -90 mΑ current 01,02, |04,05, |07,08 | |03,06 | All inputs = GND V_{CC} = max Power supply current ICC 1,2,3 105 mΑ 38 109 Input clamp voltage VCL $V_{CC} = min, I_{IN} = -18 \text{ mA}$ 1,2,3 A11 -1.2 ٧

See footnotes at end of table.

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- Group	- Continu	<u>-</u>	Limits	1
A sub-	A sub- [groups t	type [Min Max	Uni
1,2,3	1,2,3	A11	40	μA
- 	T 	ALL -	-40	T
9,10,11	10	02,05	50 30	l ns
 		03,06 07,08	65	<u> </u>
9,10,11	ĺ	01,04 02,05, 07,08,	25	ns
		03,06	35	Ť
9,10,11	77 70	02,05 03,06 07,08,	40 25 35 15	ns
9,10,11	9,10,11	A11	0	ns
9,10,11	9,10,11	A11	0	ns
1	9,10,11 To	01,02,1	30 25 55	† ns
9,10,11			0	ns
		. <u> </u>	1	<u>.l</u>
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LEVEL	 'EL	$\overline{}$		
				VEL SHEET

Test	Symbol	Conditions	Group A sub-	Device	Li	Unit	
1000		Conditions $-55^{\circ}\text{C} \leq \text{T}_{\text{C}} \leq +125^{\circ}\text{C}$ 4.5 Y dc \leq V _C C \leq 5.5 Y dc unless otherwise specified	groups		Min	Max I	Ť
Min write enable pulse width to insure write	t _{pw(WE)}	ee figures 4 and 5	9,10,11	104,05			ns
			1	03,06 07,08	55 20		<u> </u>
Delay from chip select (HIGH) to inactive	t _{PHZ} (CS)	ee figures 4 and 6 $\frac{4}{5}$	9,10,11	01,04, 109		 25 	ns
output (HI-Z)				102,05, 07,08 03,06		20	<u>[</u>
			<u> </u>	103,00		33	<u> </u>
Delay from write enable (LOW) to inactive	tPLZ(WE)	ee figures 4 and 5 $\frac{4}{5}$	9,10,11	01,03,		35	ns
output (HI-Z)	PHZ(WE)		j	102,05, 109 107,08		25 20	† L

- 1/ These are absolute voltages with respect to device ground pin and include all overshoots due to system and/or tester noise. Do not attempt to test these values without suitable equipment.
- $\underline{2}/$ Not more than one output should be shorted at a time. Duration of the short circuit should not be more than one second.
- $\frac{3}{}$ Parameters tpLH(A) and tpHL(A) are tested with S1 closed and CL = 30 pF with both input and output timing referenced to 1.5 V.
- 4/ For open collector, all delays from Write Enable ($\overline{\text{WE}}$) or Chip Select ($\overline{\text{CS}}$) inputs to the Data Output (D_{OUT}), $\text{tp}_{LZ}(\overline{\text{WE}})$, $\text{tp}_{LZ}(\overline{\text{CS}})$, $\text{tp}_{LZ}(\overline{\text{WE}})$, and $\text{tp}_{ZL}(\overline{\text{CS}})$ are measured with S1 closed and C1 = 30 pF; and with both the input and output timing referenced to 1.5 V.
- 5/ For 3-state output, $tpZH(\overline{WE})$ and $tpZH(\overline{CS})$ are measured with S1 open, CL=30 pF and with both the input and output timing referenced to 1.5 V. Parameters $tpZL(\overline{WE})$ and $tpZL(\overline{CS})$ are measured with S1 closed, CL=30 pF and with both the input and output timing referenced to 1.5 V. Parameters $tpHZ(\overline{WE})$ and $tpHZ(\overline{CS})$ are measured with S1 open and CL<5 pF and are measured between the 1.5 V level on the input and the VOH=-500 mV level on the output. Parameters $tpLZ(\overline{WE})$ and $tpLZ(\overline{CS})$ are measured with S1 closed CL<5 pF and are measured between the 1.5 V level on the input and the VOL=+500 mV level on the output.
- 6/ Output is preconditioned to data in (inverted) during write to ensure correct data is present on all outputs when write is terminated. (No write recovery glitch).

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- 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).
- 3.8 <u>Verification and review.</u> 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 <u>Screening</u>. 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 ($C_{\rm IN}$ and $C_{\rm OUT}$ measurements) shall be measured only for the initial process or design changes which may affect capacitance. Sample size is 15 devices with no failures, and all input and output terminals tested.

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TABLE II. Electrical test requirements.

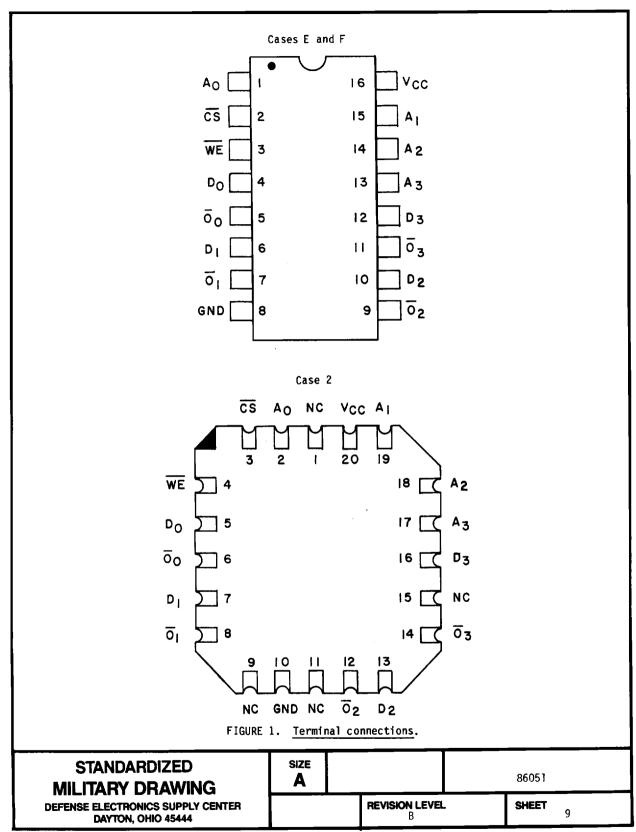
MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
 Interim electrical parameters (method 5004)	
 Final electrical test parameters (method 5004)	 1*,2,3,7,8,9,
	 1,2,3,4***,7,8,
Groups C and D end-point electrical parameters (method 5005)	1,2,3

PDA applies to subgroup 1. Subgroups 10 and 11, if not tested, shall be guaranteed to the specified limits in table I. *** For subgroup 4 see 4.3.1c.

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 conditions, method 1005 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) $T_{\Delta} = +125^{\circ}C$, minimum.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.
- 5. PACKAGING
- 5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.
 - 6. NOTES
- 6.1 <u>Intended use.</u> 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.

SIZE **STANDARDIZED** A 86051 MILITARY DRAWING **DEFENSE ELECTRONICS SUPPLY CENTER REVISION LEVEL** SHEET DAYTON, OHIO 45444 8

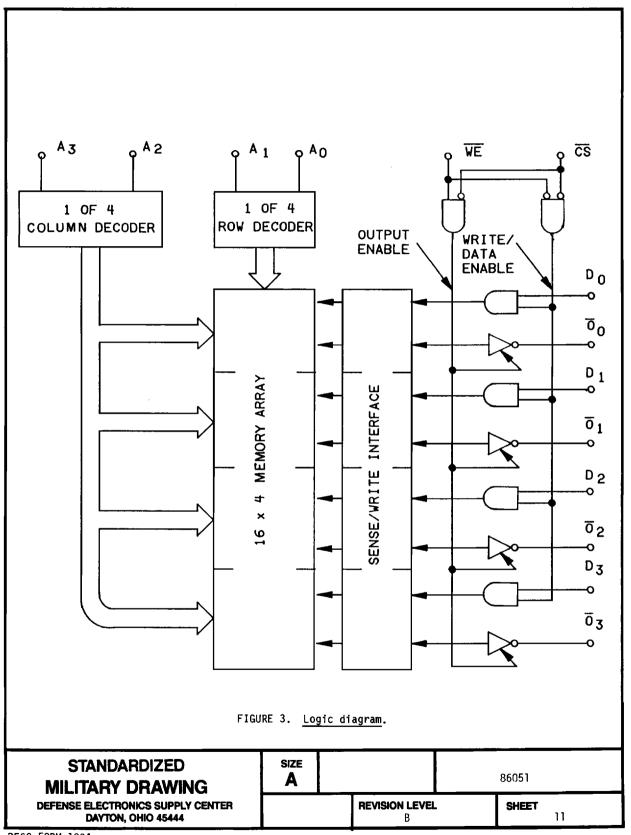


Input CS WE	Data out status Ö	pu <u>t</u> 0-03	Mode	
LL	Output dis	abled	Write	
L H	Selected (inverte	word d)	Read	T
нх	Output dis	abled	Deselect	<u> </u>
H = HIGH L = LOW X = Don't Care				
FIGURE	2. Trut	h table	•	
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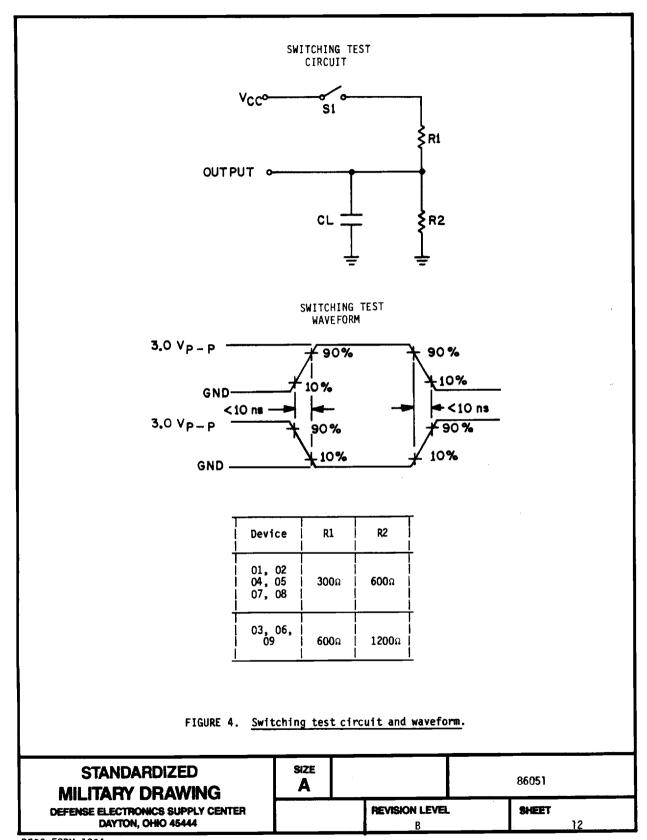
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6.4 Approved source of supply. An approved source of supply is listed herein. Additional sources will be added as they become available. The vendor listed herein has agreed to this drawing and a certificate of compliance (see 3.5) has been submitted to DESC-ECS.

	Vendor	Vendor
Military drawing	CAGE	similar part
part number	number	number 1/
,		i - i
1		
8605101EX		AM27SO2/BEA
8605101FX		AM27SO2/BFA
86051012X	34335	AM27S02/B2A
 8605102EX	34335	
		AM27S02A/BEA
8605102FX		AM27S02A/BFA
86051022X	34335	AM27S02A/B2A
 8605103EX	2/	IAM27LSO2/BEA
8605103FX		AM27LS02/BFA
•		
86051032X	2/	AM27LSO2/B2A
1		<u> </u>
8605104EX	34335	AM27S03/BEA
8605104FX		AM27S03/BFA
86051042X		AM27S03/B2A
1 000320121	0.000	I I
8605105EX	34335	IAM27SO3A/BEA I
8605105FX		IAM27SO3A/BFA
86051052X	34335	AM27S03A/B2A
T		
8605106EX /		AM27LSO3/BEA
8605106FX		AM27LS03/BFA
86051062X	34335	AM27LS03/B2A
0.00510757	24225	14M07C00 00/DE4
8605107EX		AM27S02-20/BEA
8605107FX		AM27S02-20/BFA
86051072X	34335	AM27S02-20/B2A
	34335	
		AM27S03-20/BEA
8605108FX		AM27S03-20/BFA
86051082X	34335	AM27S03-20/B2A
8605109EX	34335	 AM27LS03-30/BEA
8605109EX		AM27LS03-30/BFA
86051092X		IAM27LS03-30/B2A
0003103EX	J7333	[MRE / E303-30/ DEW]

- 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 approved source.

Vendor CAGE number Vendor name and address

34335

Advanced Micro Devices, Incorporated 901 Thompson Place

P.O. Box 3453 Sunnyvale, CA 94088

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