REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
F	Added device type 11. Added vendor cage code 0EU86 for device types 05 through 09. -sld	99-09-07	Raymond Monnin

REV																			
SHEET																			
REV	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
SHEET	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			

REV STATUS OF SHEETS																
REV	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14		

PMIC N/A

STANDARD MICROCIRCUIT DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

PREPARED BY
Steve L. Duncan

CHECKED BY
Michael Jones

APPROVED BY
Kendall A. Cottongim

DRAWING APPROVAL DATE
95-07-19

REVISION LEVEL
F

DEFENSE SUPPLY CENTER COLUMBUS
COLUMBUS, OHIO 43216-5000

MICROCIRCUIT, MEMORY, HYBRID, DIGITAL, STATIC RANDOM ACCESS MEMORY, CMOS, 128K X 32-BIT

SIZE	CAGE CODE	
A	**67268**	**5962-95595**

SHEET 1 OF 30

DSCC FORM 2233
APR 97

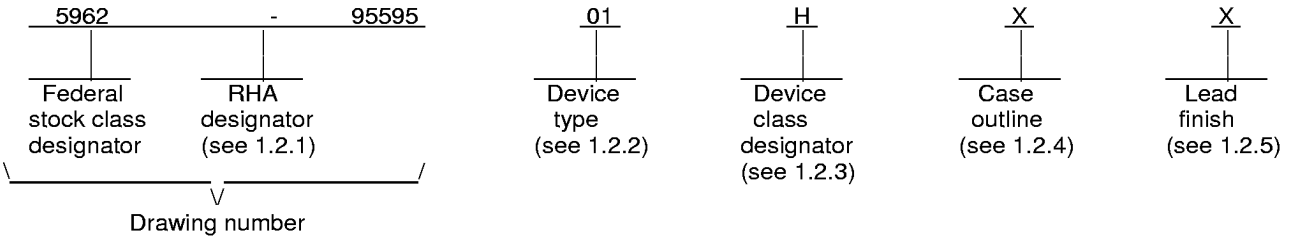
5962-E414-99

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

1. SCOPE

1.1 Scope. This drawing documents five product assurance classes, class D (lowest reliability), class E, (exceptions), class G (lowered high reliability), class H (high reliability), and class K, (highest reliability) and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of radiation hardness assurance levels are reflected in the PIN.

1.2 PIN. The PIN shall be as shown in the following example:



1.2.1 Radiation hardness assurance (RHA) designator. RHA marked devices shall meet the MIL-PRF-38534 specified RHA levels and shall be marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

1.2.2 Device type(s). The device type(s) shall identify the circuit function as follows:

Device type	Generic number	Circuit function	Access time
01	WS-128K32-120Q	SRAM, 128K x 32-BIT	120 ns
02	WS-128K32-100Q	SRAM, 128K x 32-BIT	100 ns
03	WS-128K32-85Q	SRAM, 128K x 32-BIT	85 ns
04	WS-128K32-70Q	SRAM, 128K x 32-BIT	70 ns
05	WS-128K32-55Q,ACT-S128K32N-055Q, AS8S128K32Q-55	SRAM, 128K x 32-BIT	55 ns
06	WS-128K32-45Q,ACT-S128K32N-045Q, AS8S128K32Q-45	SRAM, 128K x 32-BIT	45 ns
07	WS-128K32-35Q,ACT-S128K32N-035Q, AS8S128K32Q-35	SRAM, 128K x 32-BIT	35 ns
08	WS-128K32-25Q,ACT-S128K32N-025Q, AS8S128K32Q-25	SRAM, 128K x 32-BIT	25 ns
09	WS-128K32-20Q,ACT-S128K32N-020Q, AS8S128K32Q-20	SRAM, 128K x 32-BIT	20 ns
10	WS-128K32-17Q,ACT-S128K32N-017Q	SRAM, 128K x 32-BIT	17 ns
11	WS-128K32-15Q	SRAM, 128K x 32-BIT	15 ns

1.2.3 Device class designator. This device class designator shall be a single letter identifying the product assurance level as follows:

Device class	Device requirements documentation
D, E, G, H or K	Certification and qualification to MIL-PRF-38534

1.2.4 Case outline(s). The case outline(s) shall be as designated in MIL-STD-1835 and as follows:

Outline letter	Descriptive designator	Terminals	Package style
M 1/	See figure 1	68	Ceramic, Quad Flatpack, single/dual cavity
N	See figure 1	68	Co-fired ceramic, single cavity, ultra low profile, quad flat pack
X	See figure 1	68	Ceramic, Quad Flatpack
Y	See figure 1	68	Ceramic, Quad Flatpack, Low profile
Z	See figure 1	68	Ceramic, Quad Flatpack, dual cavity

1.2.5 Lead finish. The lead finish shall be as specified in MIL-PRF-38534.

1.3 Absolute maximum ratings. 2/

Supply voltage (V_{CC})	-0.5 V dc to +7.0 V dc
Signal voltage range (any pin)	-0.5 V dc to +7.0 V dc
Power dissipation (P_D):	
Device types 01 through 08	2.75W max
Device types 09 through 11	3.30W max
Thermal resistance junction-to-case (θ_{JC}):	
Case outlines X and Y	6.6°C/W
Case outline M	10°C/W
Case outline N	2.72°C/W
Case outline Z	8°C/W
Storage temperature	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+300°C

1.4 Recommended operating conditions.

Supply voltage (V_{CC})	+4.5 V dc to +5.5 V dc
Input low voltage range (V_{IL})	-0.3 V dc to +0.8 V dc
Input high voltage range (V_{IH})	+2.2 V dc to V_{CC} +0.5 V dc
Output low voltage, maximum (V_{OL})	+0.4 V dc
Output high voltage, minimum (V_{OH})	+2.4 V dc
Case operating temperature range (T_C)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-38534 - Hybrid Microcircuits, General Specification for.

1/ The case outline M is available in either a single or dual cavity package.
2/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Method Standard Microcircuits.
MIL-STD-973 - Configuration Management.
MIL-STD-1835 - Interface for Microcircuit Case Outlines.

HANDBOOKS

DEPARTMENT OF DEFENSE

MIL-HDBK-103 - List of Standrard Microcircuit Drawings (SMD's).
MIL-HDBK-780 - Standard Microcircuit Drawings.

(Unless otherwise indicated, copies of the specification, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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. Nothing in this document , however, supercedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item performance requirements for device classes D, E, G, H, and K shall be in accordance with MIL-PRF-38534. Compliance with MIL-PRF-38534 may include the performance of all tests herein or as designated in the device manufacturer's Quality Management (QM) plan or as designated for the applicable device class. Therefore, the tests and inspections herein may not be performed for the applicable device class (see MIL-PRF-38534). Furthermore, the manufacturer may take exceptions or use alternate methods to the tests and inspections herein and not perform them. However, the performance requirements as defined in MIL-PRF-38534 shall be met for the applicable device class.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38534 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein and figure 1.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 2.

3.2.3 Truth table(s). The truth table(s) shall be as specified on figure 3.

3.2.4 Timing diagram(s). The timing diagram(s) shall be as specified on figure 4 and 5.

3.2.5 Block diagram(s). The block diagram(s) shall be as specified on figure 6.

3.2.6 Output load circuit. The output load circuit shall be as specified on figure 7.

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

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 Marking of Device(s). Marking of device(s) shall be in accordance with MIL-PRF-38534. The device shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's vendor similar PIN may also be marked.

3.6 Data. In addition to the general performance requirements of MIL-PRF-38534, the manufacturer of the device described herein shall maintain the electrical test data (variables format) from the initial quality conformance inspection group A lot sample, for each device type listed herein. Also, the data should include a summary of all parameters manually tested, and for those which, if any, are guaranteed. This data shall be maintained under document revision level control by the manufacturer and be made available to the preparing activity (DSCC-VA) upon request.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ $V_{SS} = 0$ V dc +4.5 V dc $\le V_{CC} \le$ +5.5 V dc unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
DC PARAMETERS							
Supply current 32-bit mode	I_{CC32}	$\overline{CS} = V_{IL}$, $\overline{OE} = V_{IH}$, f = 5 MHz CMOS compatible V_{CC} = +5.5 V	1,2,3	01,02 03,04 05-11		120 120 600	mA
Standby current	I_{SB}	$\overline{CS} = \overline{OE} = V_{IH}$, f = 5 MHz CMOS compatible V_{CC} = +5.5 V	1,2,3	01,02 03,04 05-08 09-11		2.4 5.0 60 80	mA
Input Leakage current	I_{LI}	V_{CC} = +5.5 V V_{IN} = GND or V_{CC}	1,2,3	All		10	μA
Output Leakage	I_{LO}	$\overline{CS} = V_{IH}$, $\overline{OE} = V_{IH}$, V_{OUT} = GND or V_{CC}	1,2,3	All		10	μA
Output low voltage	V_{OL}	V_{CC} = +4.5 V, I_{OL} = +2.1 mA	1,2,3	01-07		0.4	V
		V_{CC} = +4.5 V, I_{OL} = +8.0 mA		08-11		0.4	
Output high voltage	V_{OH}	V_{CC} = +4.5 V, I_{OH} = -1.0 mA	1,2,3	01-07	2.4		V
		V_{CC} = +4.5 V, I_{OH} = -4.0 mA		08-11	2.4		

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$, $V_{SS} = 0$ V dc, $+4.5$ V dc $\le V_{CC} \le +5.5$ V dc unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
DATA RETENTION							
Data retention supply voltage	V_{DR}	$\overline{CS} \ge V_{CC} - 0.2$ V	1,2,3	All	2.0	5.5	V
Data retention current	I_{CCDR1}	$V_{CC} = +3.0$ V	1,2,3	01-04 05-11		1.6 11.6	mA
CAPACITANCE							
$\overline{OE}$ capacitance 2/	C_{OE}	$V_{IN} = 0$ V, f = 1.0 MHz, $T_A = +25°$ C	4	All		50	pF
$\overline{WE}$ capacitance 2/	C_{WE}	$V_{IN} = 0$ V, f = 1.0 MHz, $T_A = +25°$ C, Case outlines X and Y	4	All		50	pF
		$V_{IN} = 0$ V, f = 1.0 MHz, $T_A = +25°$ C, Case outline M, N, and Z		All		20	
$\overline{CS}$ 1-4 capacitance 2/	C_{CS}	$V_{IN} = 0$ V, f = 1.0 MHz $T_A = +25°$ C	4	All		20	pF
D0 - D31 capacitance 2/	$C_{I/O}$	$V_{I/O} = 0$ V, f = 1.0 MHz, $T_A = +25°$ C	4	All		20	pF
A0 - A16 capacitance 2/	C_{AD}	$V_{IN} = 0$ V, f = 1.0 MHz $T_A = +25°$ C	4	All		50	pF
FUNCTIONAL TESTING							
Functional tests		See 4.3.1c	7,8A,8B				

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ $V_{SS} = 0$ V dc $+4.5$ V dc $\le V_{CC} \le +5.5$ V dc unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
READ CYCLE AC TIMING							
Read cycle time	t_{RC}	See figure 4	9,10,11	01 02 03 04 05 06 07 08 09 10 11	120 100 85 70 55 45 35 25 20 17 15		ns
Address access time	t_{AA}	See figure 4	9,10,11	01 02 03 04 05 06 07 08 09 10 11		120 100 85 70 55 45 35 25 20 17 15	ns
Output hold from address change	t_{OH}	See figure 4	9,10,11	01-04 05-11	5 0		ns
Chip select access time	t_{ACS}	See figure 4	9,10,11	01 02 03 04 05 06 07 08 09 10 11		120 100 85 70 55 45 35 25 20 17 15	ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ $V_{SS} = 0$ V dc +4.5 V dc $\le V_{CC} \le$ +5.5 V dc unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
READ CYCLE AC TIMING - CONTINUED							
Output enable to output valid	t_{OE}	See figure 4	9,10,11	01		60	ns
				02		50	
				03		45	
				04		35	
				05		30	
				06		25	
				07		20	
				08		15	
				09		12	
				10,11		10	
WRITE CYCLE AC TIMING							
Write cycle time	t_{WC}	See figure 5	9,10,11	01	120		ns
				02	100		
				03	85		
				04	70		
				05	55		
				06	45		
				07	35		
				08	25		
				09	20		
				10	17		
				11	15		
Chip select to end of write	t_{CW}	See figure 5	9,10,11	01	100		ns
				02	80		
				03	75		
				04	60		
				05	45		
				06	30		
				07	25		
				08	20		
				09	15		
				10,11	14		

See footnotes at end of table.

TABLE I. Electrical performance characteristics- Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$, $V_{SS} = 0$ V dc, $+4.5$ V dc $\le V_{CC} \le +5.5$ V dc unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
WRITE CYCLE AC TIMING - CONTINUED							
Address select to end of write	t_{AW}	See figure 5	9,10,11	01 02 03 04 05 06 07 08 09,10 11	100 80 75 60 45 30 25 20 15 14		ns
Data valid to end of write	t_{DW}	See figure 5	9,10,11	01 02 03 04 05 06 07 08 09 10,11	50 40 35 30 25 25 20 15 12 10		ns
Address setup time	t_{AS}	See figure 5	9,10,11	01-04 05-11	5 0		ns
Write pulse width	t_{WP}	See figure 5	9,10,11	01 02 03 04 05 06 07 08 09 10,11	80 70 55 50 45 30 25 20 15 14		ns
Address hold time	t_{AH}	See figure 5	9,10,11	01-04 05-11	5 0		ns

See footnotes at end of table.

TABLE I. Electrical performance characteristics- Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$, $V_{SS} = 0$ V dc, $+4.5$ V dc $\le V_{CC} \le +5.5$ V dc unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
Output active from end of write	t_{OW}	See figure 5	9,10,11	01-04 05-07 08-11	5 4 3		ns
Data hold time	t_{DH}	See figure 5	9,10,11	All	0		ns

1/ Unless otherwise specified, the AC test conditions are as follows:

Input pulse levels: V_{IL} = 0 V and V_{IH} = 3.0 V
Input rise and fall times: 5 nanoseconds
Input and output timing reference levels: 1.5 V, ± 0.5 V
Output loading: See figure 7

Unless otherwise specified, the DC test conditions are as follows:
V_{IL} = 0.3 V and $V_{IH} = V_{CC}$ - 0.3 V

2/ Parameters shall be tested as part of device initial characterization and after any design or process changes which may affect these parameters. Parameters shall be guaranteed to the limits specified in table I for all lots not specifically tested.

Case outlines M and Z

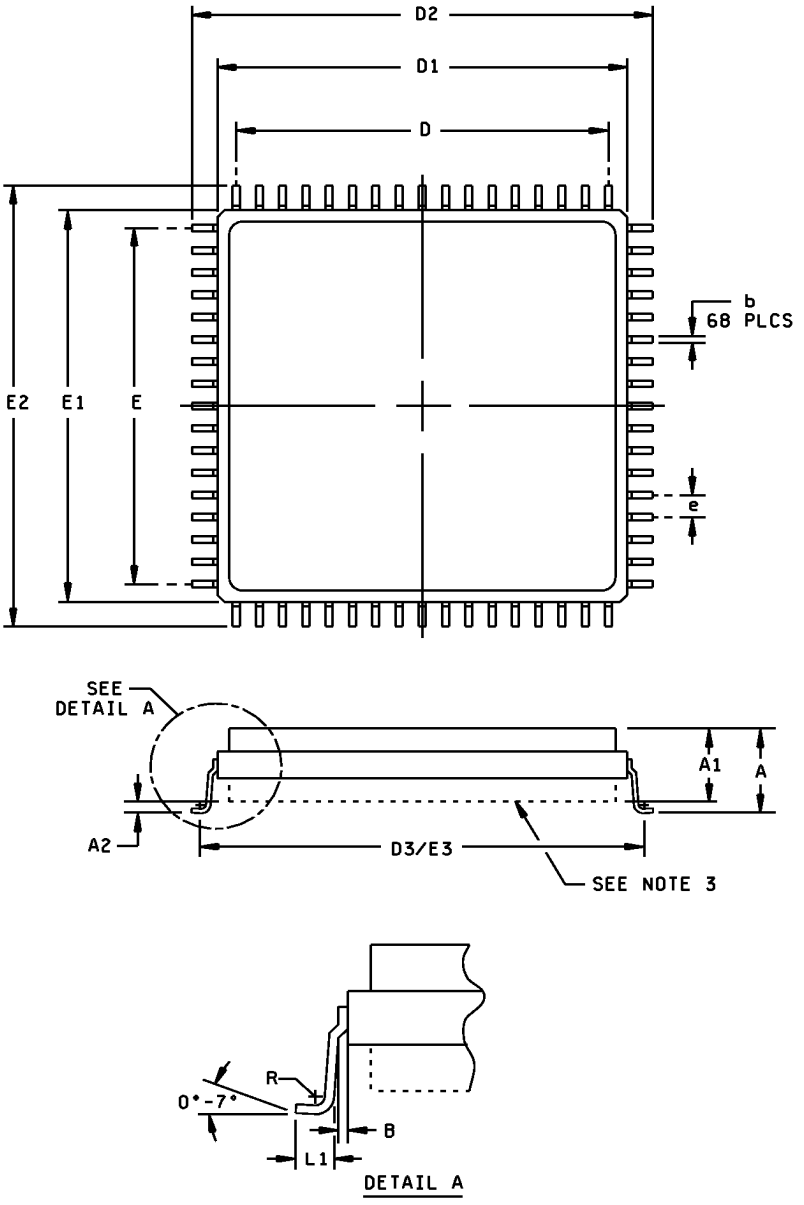


FIGURE 1. Case outline(s).

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE **A**		**5962-95595**
		REVISION LEVEL F	SHEET **11**

DSCC FORM 2234
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Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	3.12	5.10	.123	.200
A1	2.30	4.72	.118	.186
A2	0.13	0.38	.005	.015
b	0.33	0.43	.013	.017
B	0.25 REF		.010 REF	
D/E	20.32 BSC		.800 BSC	
D1/E1	22.10	22.61	.870	.890
D2/E2	24.89	25.40	.980	1.000
D3/E3	23.77	24.28	.936	.956
e	1.27 BSC		.050 BSC	
R	0.25 TYP		.010 TYP	
L1	0.89	1.14	.035	.045

NOTES:
1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Pin numbers are for reference only.
3. Case outline M may be either a single or dual cavity package.

FIGURE 1. Case outlines- Continued.

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	3.81	5.10	.150	.200
A1	3.76	4.72	.148	.186
A2	0.00	0.38	.000	.020
b	0.33	0.43	.013	.017
B	0.25 REF		.010 REF	
D/E	20.32 BSC		.800 BSC	
D1/E1	22.10	22.65	.870	.890
D2/E2	24.89	25.35	.980	1.000
D3/E3	23.75	24.28	.936	.956
e	1.27 BSC		.050 BSC	
R	0.13 TYP		.005 TYP	
L1	0.89	1.14	.035	.045

NOTES:
1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Pin numbers are for reference only.

FIGURE 1. Case outlines- Continued.

Case outline N

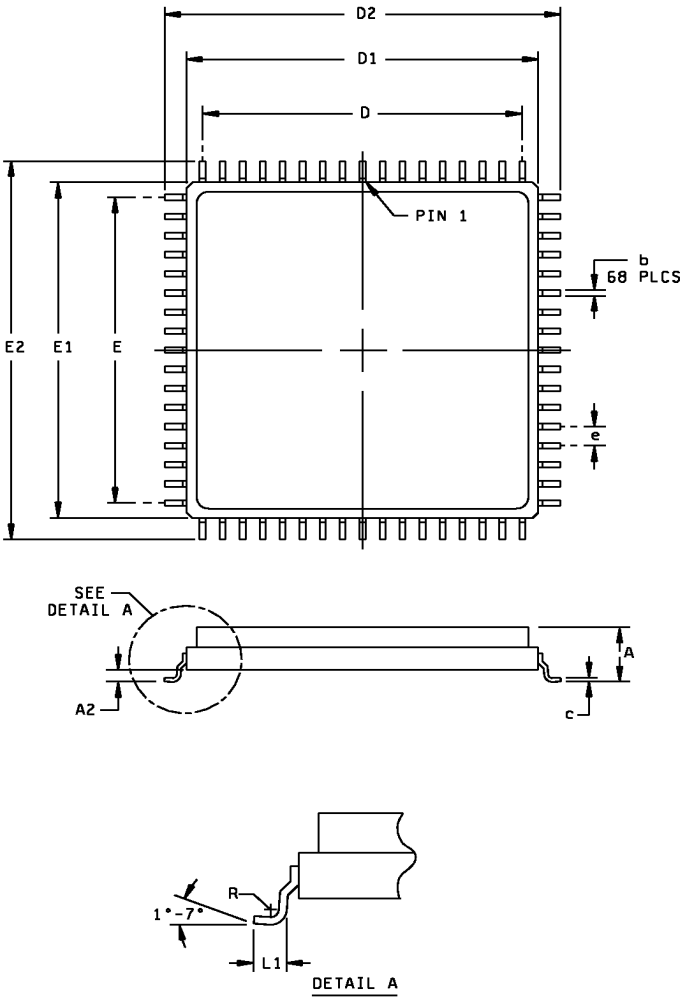

FIGURE 1. Case outlines - Continued.

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		3.56		.140
A2	0.36	0.71	.014	.028
b	0.33	0.43	.013	.017
c	0.23	0.30	.009	.012
D/E	20.32 BSC		.800 BSC	
D1/E1	22.10	22.61	.870	.890
D2/E2	24.89	25.35	.980	1.000
e	1.27 TYP		.050 TYP	
R	0.13 MIN		.005 MIN	
L1	0.89	1.14	.035	.045

NOTES:
1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Pin numbers are for reference only.

FIGURE 1. Case outlines - Continued.

Case outline X

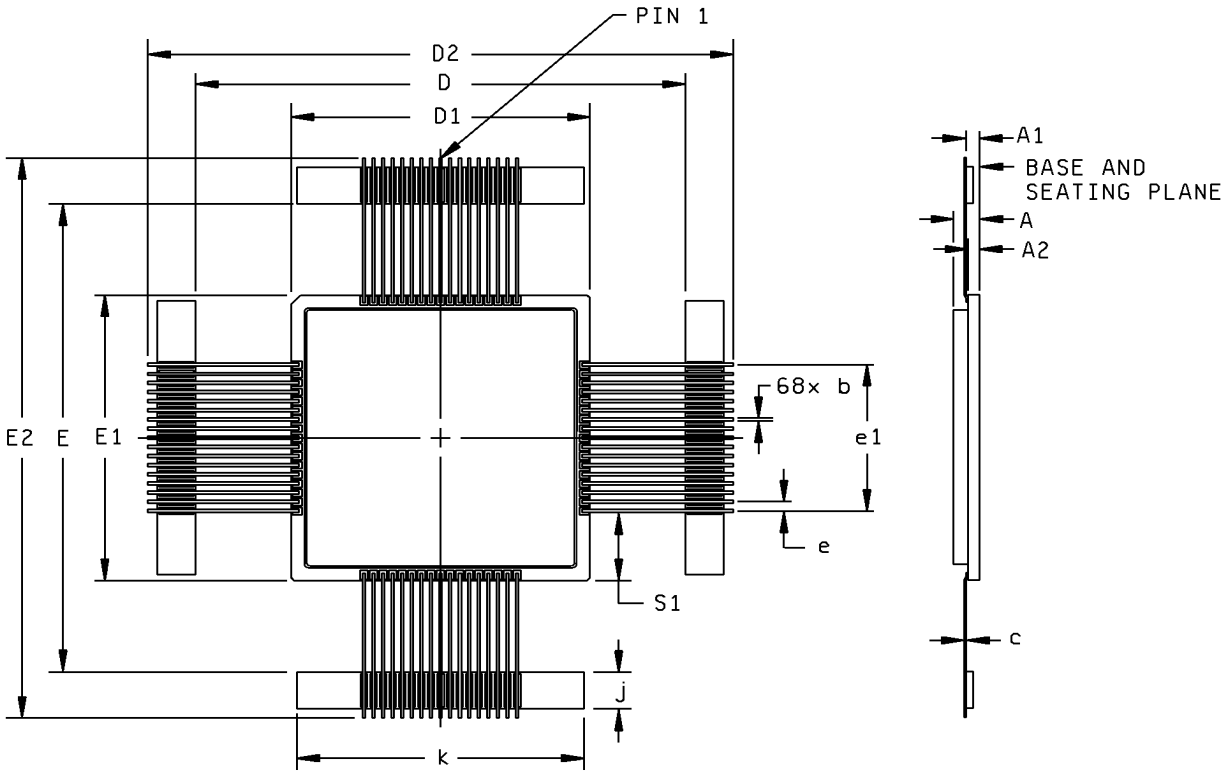

FIGURE 1. Case outline(s) - Continued.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE **A**		**5962-95595**
		REVISION LEVEL F	SHEET **16**

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Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.92	5.08	.115	.200
A1	1.524 BSC		.060 BSC	
A2	1.14	1.40	.045	.055
b	0.31	0.46	.012	.018
c	0.23	0.31	.009	.012
D/E	63.63	66.42	2.505	2.615
D1/E1	39.24	40.01	1.545	1.575
D2/E2	73.28	84.20	2.885	3.315
e	1.27 BSC		.050 BSC	
e1	20.32 BSC		.800 BSC	
j	4.83	5.33	.190	.210
k	37.72	38.48	1.485	1.515
S1	9.65 BSC		.380 BSC	

NOTES:
1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Pin numbers are for reference only.

FIGURE 1. Case outline(s) - Continued.

Case outline Y

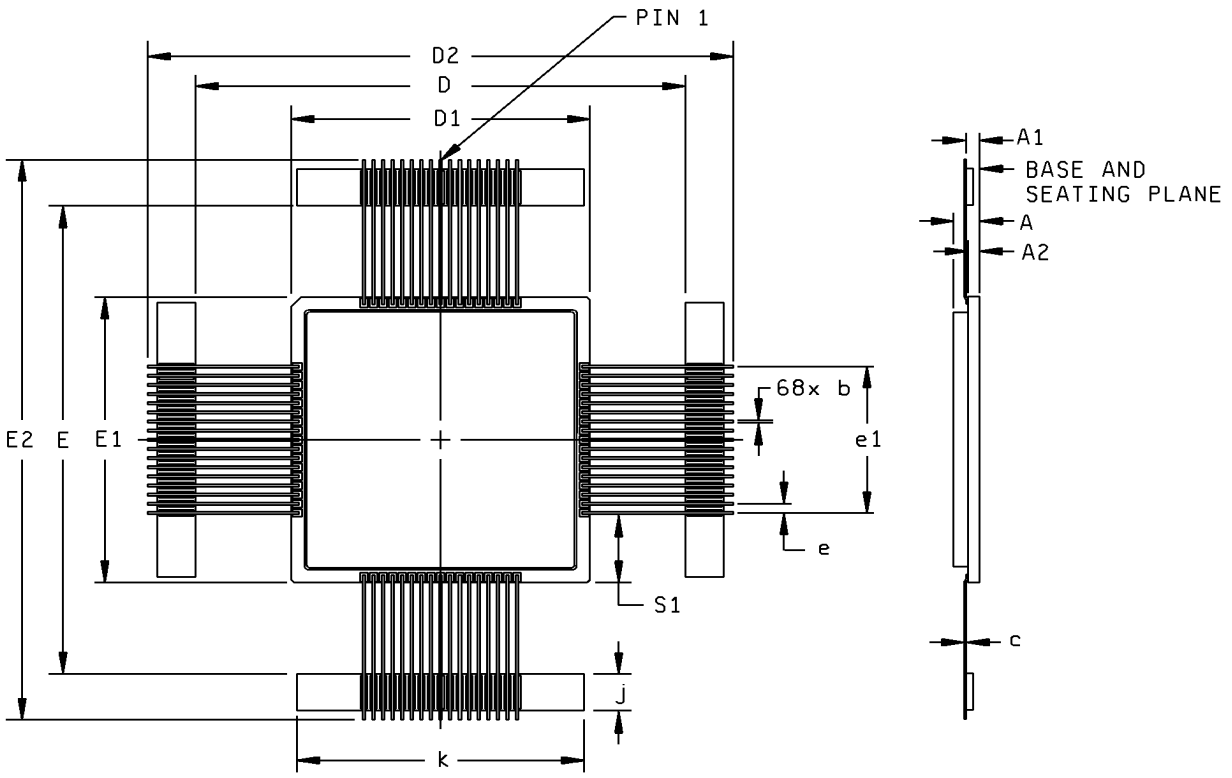

FIGURE 1. Case outline(s) - Continued.

STANDARD MICROCIRCUIT DRAWING DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43216-5000	SIZE **A**		**5962-95595**
		REVISION LEVEL F	SHEET **18**

DSCC FORM 2234
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Case outline Y - Continued

Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.92	3.56	.115	.140
A1	1.524 BSC		.060 BSC	
A2	1.14	1.40	.045	.055
b	0.31	0.46	.012	.018
c	0.23	0.31	.009	.012
D/E	63.63	66.42	2.505	2.615
D1/E1	39.24	40.01	1.545	1.575
D2/E2	73.28	84.20	2.885	3.315
e	1.27 BSC		.050 BSC	
e1	20.32 BSC		.800 BSC	
j	4.83	5.33	.190	.210
k	37.72	38.48	1.485	1.515
S1	9.65 BSC		.380 BSC	

NOTES:
1. The U.S. preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Pin numbers are for reference only.

FIGURE 1. Case outline(s) - Continued.

Device types	All	Device types	All	Device types	All	Device types	All
Case outlines	M, N	Case outlines	M, N	Case outlines	M, N	Case outlines	M, N
Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol
1	GND	18	GND	35	$\overline{OE}$	52	GND
2	$\overline{CS3}$	19	I/O8	36	$\overline{CS2}$	53	I/O23
3	A5	20	I/O9	37	NC	54	I/O22
4	A4	21	I/O10	38	$\overline{WE2}$	55	I/O21
5	A3	22	I/O11	39	$\overline{WE3}$	56	I/O20
6	A2	23	I/O12	40	$\overline{WE4}$	57	I/O19
7	A1	24	I/O13	41	NC	58	I/O18
8	A0	25	I/O14	42	NC	59	I/O17
9	NC	26	I/O15	43	NC	60	I/O16
10	I/O0	27	V_{CC}	44	I/O31	61	V_{CC}
11	I/O1	28	A11	45	I/O30	62	A10
12	I/O2	29	A12	46	I/O29	63	A9
13	I/O3	30	A13	47	I/O28	64	A8
14	I/O4	31	A14	48	I/O27	65	A7
15	I/O5	32	A15	49	I/O26	66	A6
16	I/O6	33	A16	50	I/O25	67	$\overline{WE1}$
17	I/O7	34	$\overline{CS1}$	51	I/O24	68	$\overline{CS4}$

FIGURE 2. Terminal connections .

Device types	05-10	Device types	05-10	Device types	05-10	Device types	05-10
Case outline	Z	Case outline	Z	Case outline	Z	Case outline	Z
Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol
1	GND	18	GND	35	$\overline{OE}$	52	GND
2	$\overline{CS3}$	19	I/O8	36	$\overline{CS2}$	53	I/O23
3	A5	20	I/O9	37	NC	54	I/O22
4	A4	21	I/O10	38	$\overline{WE2}$	55	I/O21
5	A3	22	I/O11	39	$\overline{WE3}$	56	I/O20
6	A2	23	I/O12	40	$\overline{WE4}$	57	I/O19
7	A1	24	I/O13	41	NC	58	I/O18
8	A0	25	I/O14	42	NC	59	I/O17
9	NC	26	I/O15	43	NC	60	I/O16
10	I/O0	27	V_{CC}	44	I/O31	61	V_{CC}
11	I/O1	28	A11	45	I/O30	62	A10
12	I/O2	29	A12	46	I/O29	63	A9
13	I/O3	30	A13	47	I/O28	64	A8
14	I/O4	31	A14	48	I/O27	65	A7
15	I/O5	32	A15	49	I/O26	66	A6
16	I/O6	33	A16	50	I/O25	67	$\overline{WE1}$
17	I/O7	34	$\overline{CS1}$	51	I/O24	68	$\overline{CS4}$

FIGURE 2. Terminal connections - Continued.

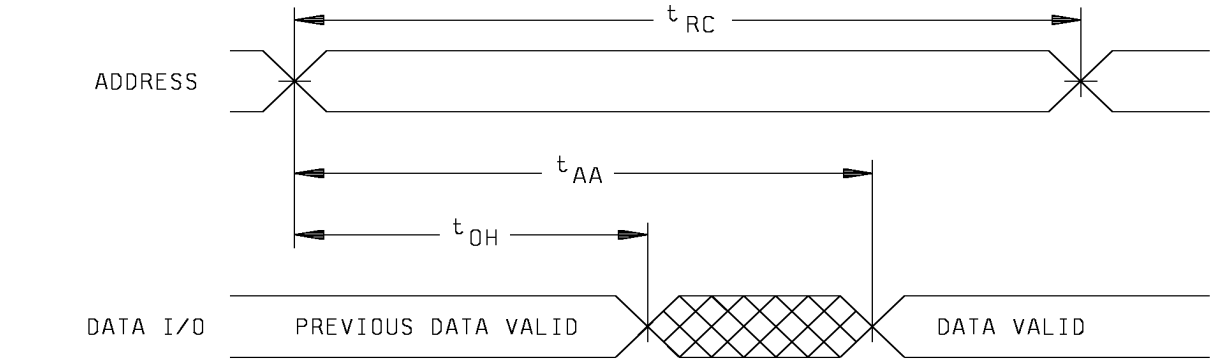
Device types	All	Device types	All	Device types	All	Device types	All
Case outlines	X,Y	Case outlines	X,Y	Case outlines	X,Y	Case outlines	X,Y
Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol	Terminal number	Terminal symbol
1	GND	18	GND	35	$\overline{OE}$	52	GND
2	$\overline{CS}$1	19	I/O8	36	$\overline{CS}$4	53	I/O23
3	A5	20	I/O9	37	NC	54	I/O22
4	A4	21	I/O10	38	NC	55	I/O21
5	A3	22	I/O11	39	NC	56	I/O20
6	A2	23	I/O12	40	NC	57	I/O19
7	A1	24	I/O13	41	NC	58	I/O18
8	A0	25	I/O14	42	NC	59	I/O17
9	NC	26	I/O15	43	NC	60	I/O16
10	I/O0	27	V_{CC}	44	I/O31	61	V_{CC}
11	I/O1	28	A11	45	I/O30	62	A10
12	I/O2	29	A12	46	I/O29	63	A9
13	I/O3	30	A13	47	I/O28	64	A8
14	I/O4	31	A14	48	I/O27	65	A7
15	I/O5	32	A15	49	I/O26	66	A6
16	I/O6	33	A16	50	I/O25	67	$\overline{WE}$
17	I/O7	34	$\overline{CS}$2	51	I/O24	68	$\overline{CS}$3

FIGURE 2. Terminal connections - Continued.

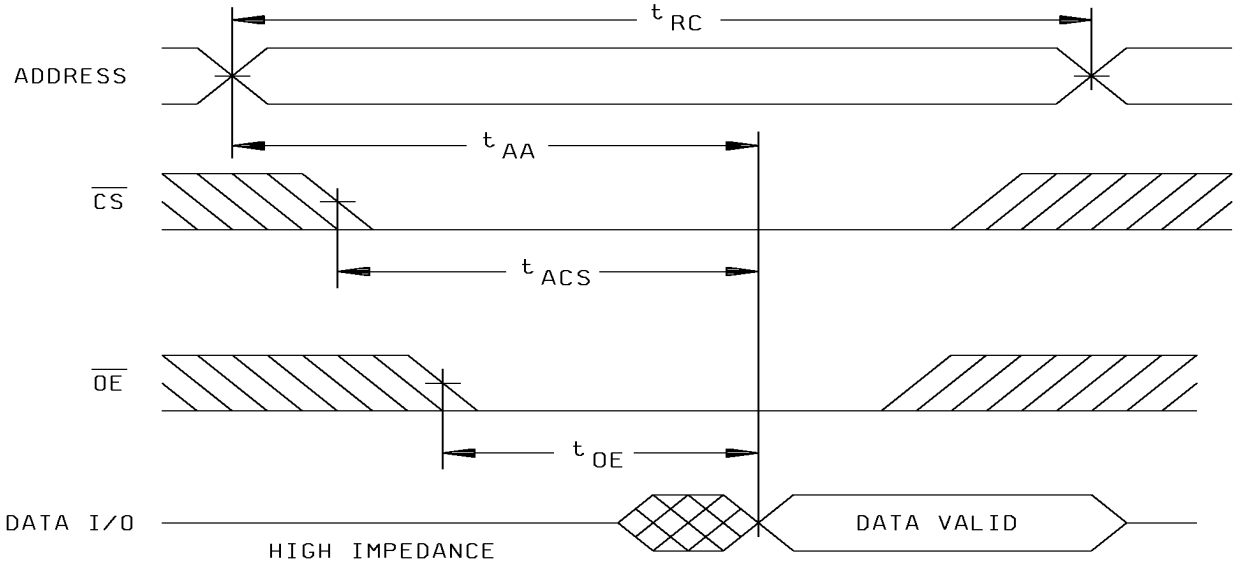
$\overline{CS}$	$\overline{OE}$	$\overline{WE}$	Mode	Data I/O	Power
H	X	X	Standby	High Z	Standby
L	L	H	Read	Data out	Active
L	H	H	Output disable	High Z	Active (deselect)
L	X	L	Write	Data in	Active

NOTES:
1. H = V_{IH} = High Logic Level.
2. L = V_{IL} = Low Logic Level.
3. X = Do not care (either high or low).
4. High Z = High Impedance state.

FIGURE 3. Truth table.

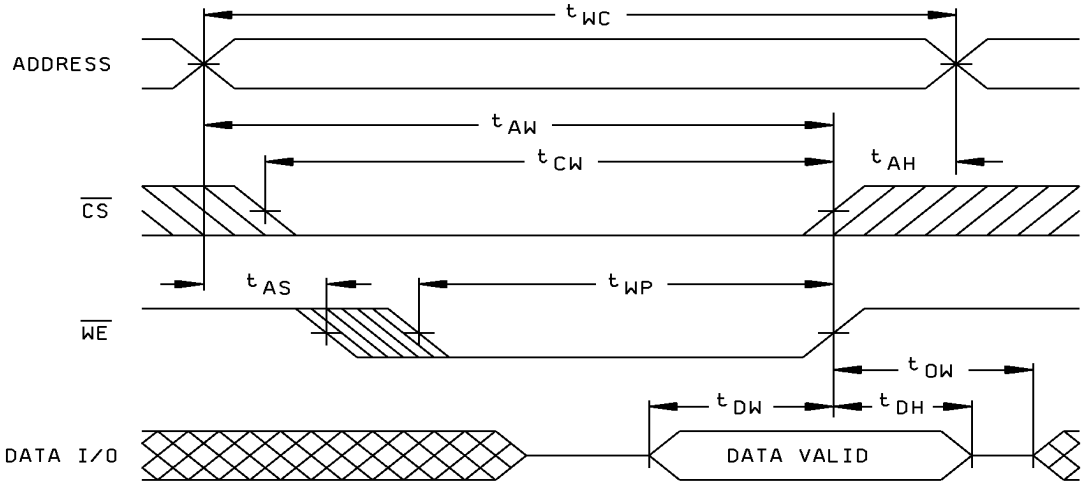


READ CYCLE 1 ($\overline{CS}$ = $\overline{OE}$ = V_{IL}, $\overline{WE}$ = V_{IH})

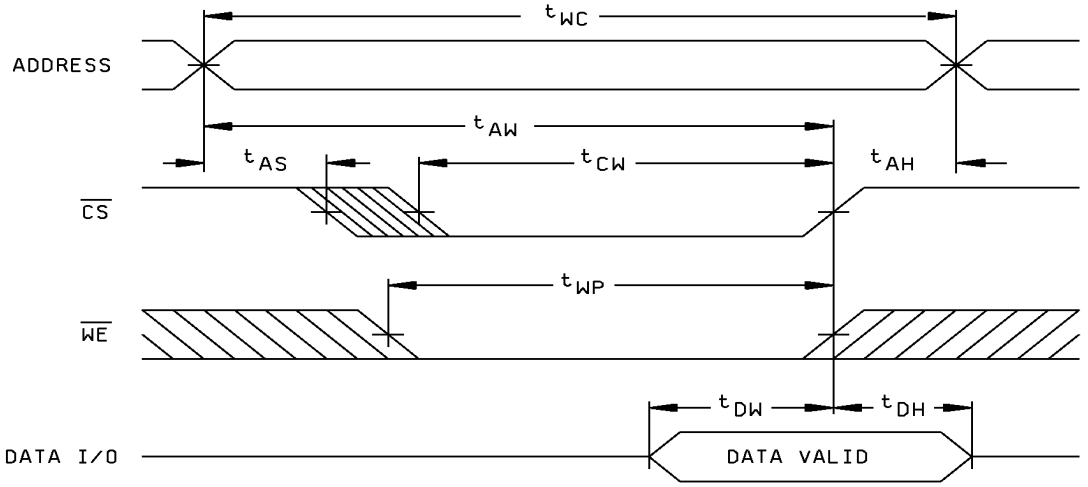


READ CYCLE 2 ($\overline{WE}$ = V_{IH})

FIGURE 4. Read cycle timing diagram.



WRITE CYCLE 1 $\overline{WE}$ CONTROLLED



WRITE CYCLE 2 $\overline{CS}$ CONTROLLED

FIGURE 5. Write cycle timing diagram.

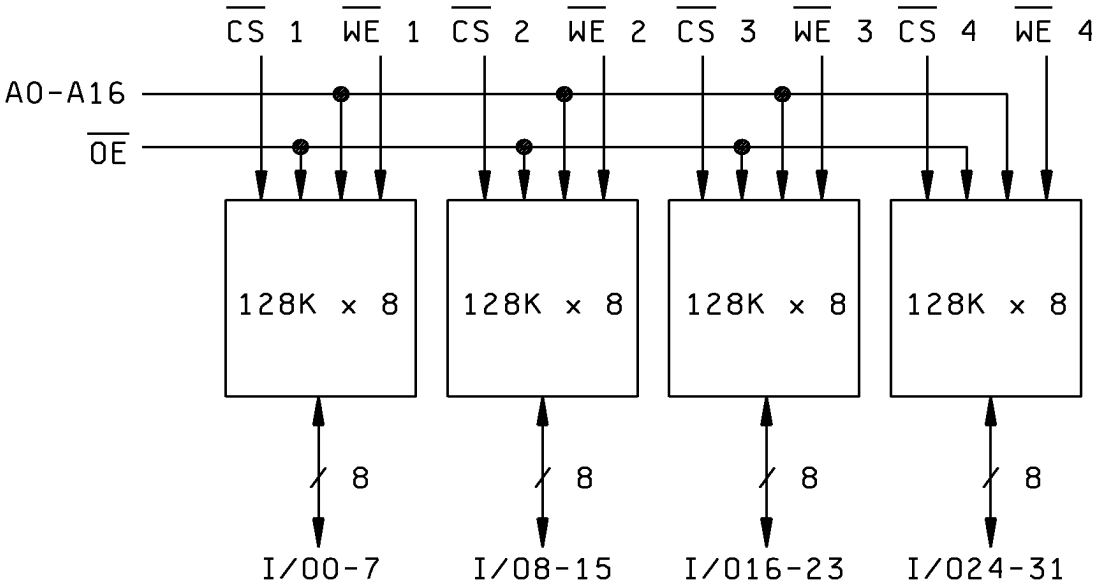


FIGURE 6. Block diagram(s).

Case outlines X and Y

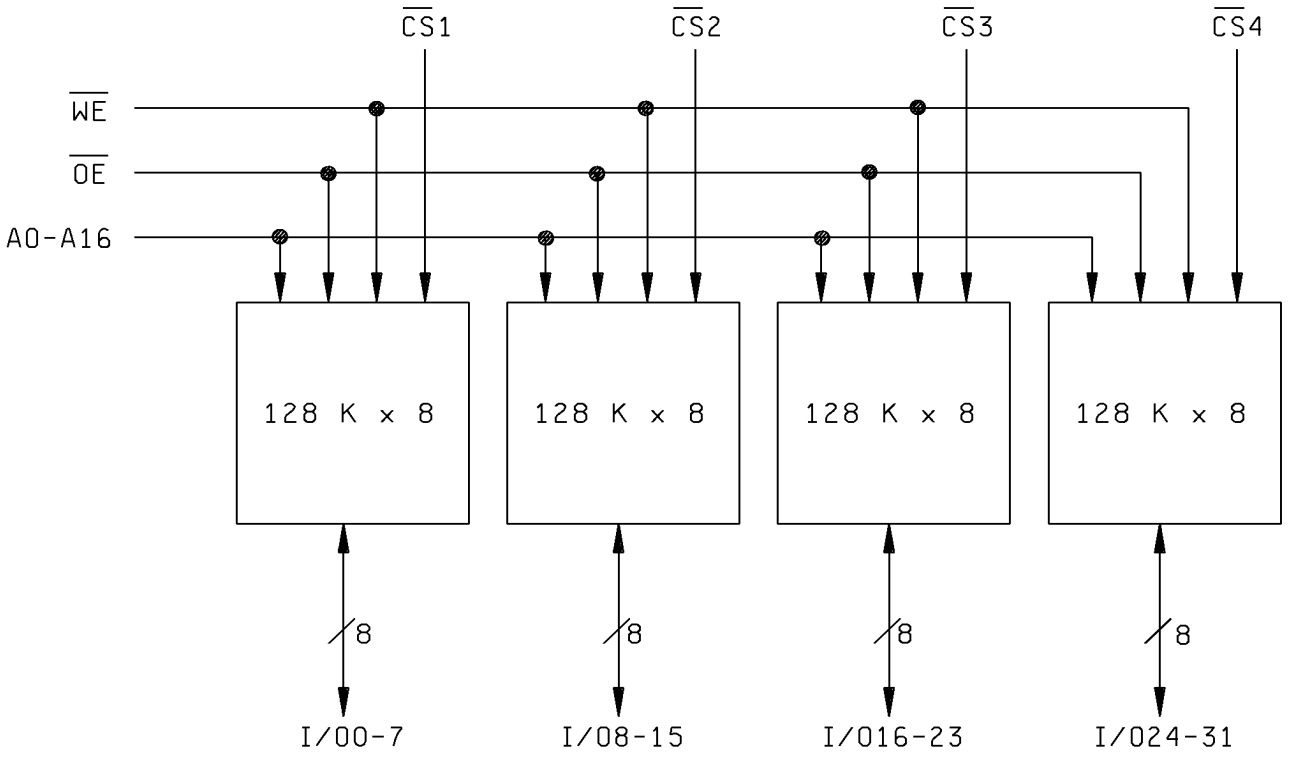
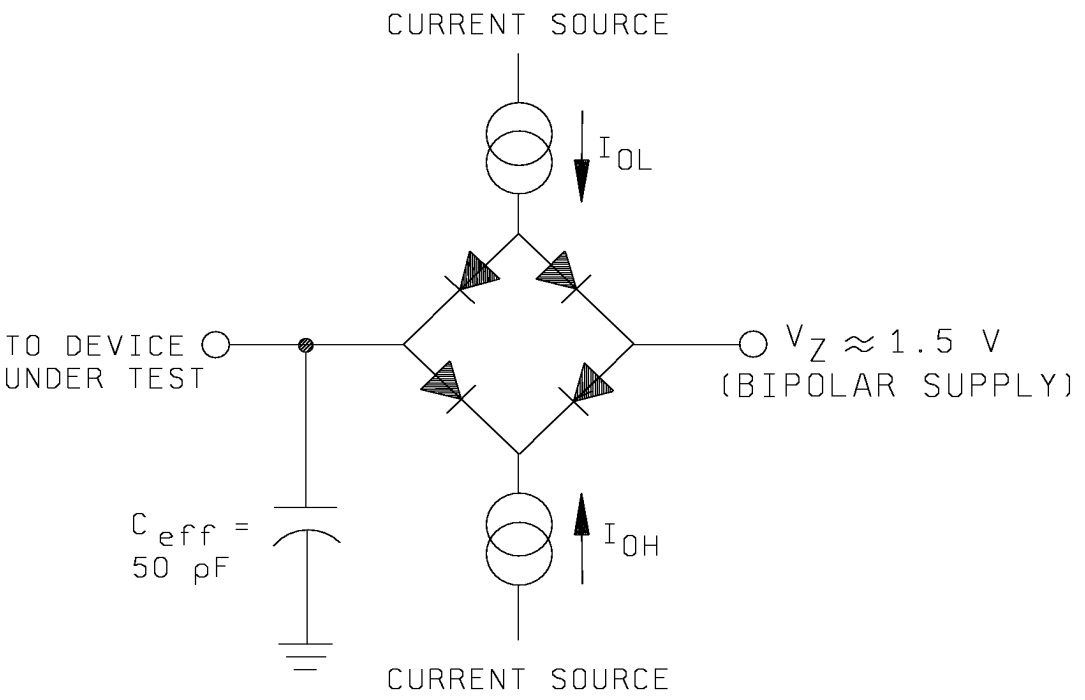


FIGURE 6. Block diagram(s) - Continued.



Parameter	Typ.	Unit
Input Pulse Level	0 - 3.0	V
Input Rise and Fall	5	nS
Input and Output Reference Level	1.5	V
Output Load Capacitance	50	pf

NOTES:
1. V_Z is programmable from -2V to +7V.
2. I_{OL} and I_{OH} are programmable from 0 to 16mA.
3. Tester impedance is ZO = 75 Ohms.
4. V_Z is typically the midpoint of V_{OH} and V_{OL}.
5. I_{OL} and I_{OH} are adjusted to simulate a typical resistive load circuit.
6. ATE tester includes jig capacitance.

FIGURE 7. Output load circuit.

3.7 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to supply to this drawing. The certificate of compliance (original copy) submitted to DSCC-VA shall affirm that the manufacturer's product meets the performance requirements of MIL-PRF-38534 and herein.

3.8 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38534 shall be provided with each lot of microcircuits delivered to this drawing.

TABLE II. Electrical test requirements.

MIL-PRF-38534 test requirements	Subgroups (in accordance with MIL-PRF-38534, group A test table)
Interim electrical parameters	1,4,7,9
Final electrical test parameters	1*,2,3,4,7,8A,8B,9,10, 11
Group A test requirements	1,2,3,4,7,8A,8B,9,10, 11
Group C end-point electrical parameters	1,2,3,4,7,8A,8B,9,10, 11
End-point electrical parameters for Radiation Hardness Assurance (RHA) devices	Not applicable

* PDA applies to subgroup 1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38534 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

4.2 Screening. Screening shall be in accordance with MIL-PRF-38534. The following additional criteria shall apply:

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

(1) Test condition B. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DSCC-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

(2) T_A as specified in accordance with table I of method 1015 of MIL-STD-883.

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 Conformance and periodic inspections. Conformance inspection (CI) and periodic inspection (PI) shall be in accordance with MIL-PRF-38534 and as specified herein.

4.3.1 Group A inspection (CI). Group A inspection shall be in accordance with MIL-PRF-38534 and as follows:

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

b. Subgroups 5 and 6 shall be omitted.

c. Subgroups 7 and 8 shall include verification of the truth table on figure 3.

4.3.2 Group B inspection (PI). Group B inspection shall be in accordance with MIL-PRF-38534.

4.3.3 Group C inspection (PI). Group C inspection shall be in accordance with MIL-PRF-38534 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.

(1) Test condition B. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DSCC-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

(2) T_A as specified in accordance with table I of method 1005 of MIL-STD-883.

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

4.3.4 Group D inspection (PI). Group D inspection shall be in accordance with MIL-PRF-38534.

4.3.5 Radiation Hardness Assurance (RHA) inspection. RHA inspection is not currently applicable to this drawing.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38534.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

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

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-973 using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus when a system application requires configuration control and the applicable SMD. DSCC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronic devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0544.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43216-5000, or telephone (614) 692-0512.

6.6 Sources of supply. Sources of supply are listed in MIL-HDBK-103 and QML-38534. The vendors listed in MIL-HDBK-103 and QML-38534 have submitted a certificate of compliance (see 3.7 herein) to DSCC-VA and have agreed to this drawing.

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN

DATE: 99-09-07

Approved sources of supply for SMD 5962-95595 are listed below for immediate acquisition only and shall be added to MIL-HDBK-103 and QML-38534 during the next revisions. MIL-HDBK-103 and QML-38534 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revisions of MIL-HDBK- 103 and QML-38534.

Standardized microcircuit drawing PIN 1/	Vendor CAGE number	Vendor similar PIN 2/
5962-9559501HMC	54230	WS-128K32-120G2Q, WS-128K32-120G2UQ
5962-9559501HMA	54230	WS-128K32-120G2Q, WS-128K32-120G2UQ
5962-9559501HNC	54230	WS-128K32-120G2UQ
5962-9559501HNA	54230	WS-128K32-120G2UQ
5962-9559501HXC	54230	WS-128K32-120G4Q
5962-9559501HXA	54230	WS-128K32-120G4Q
5962-9559501HYC	54230	WS-128K32-120G4TQ
5962-9559501HYA	54230	WS-128K32-120G4TQ
5962-9559502HMC	54230	WS-128K32-100G2Q, WS-128K32-100G2UQ
5962-9559502HMA	54230	WS-128K32-100G2Q, WS-128K32-100G2UQ
5962-9559502HNC	54230	WS-128K32-100G2UQ
5962-9559502HNA	54230	WS-128K32-100G2UQ
5962-9559502HXC	54230	WS-128K32-100G4Q
5962-9559502HXA	54230	WS-128K32-100G4Q
5962-9559502HYC	54230	WS-128K32-100G4TQ
5962-9559502HYA	54230	WS-128K32-100G4TQ
5962-9559503HMC	54230	WS-128K32-85G2Q, WS-128K32-85G2UQ
5962-9559503HMA	54230	WS-128K32-85G2Q, WS-128K32-85G2UQ
5962-9559503HNC	54230	WS-128K32-85G2UQ
5962-9559503HNA	54230	WS-128K32-85G2UQ
5962-9559503HXC	54230	WS-128K32-85G4Q
5962-9559503HXA	54230	WS-128K32-85G4Q
5962-9559503HYC	54230	WS-128K32-85G4TQ
5962-9559503HYA	54230	WS-128K32-85G4TQ
5962-9559504HMC	54230	WS-128K32-70G2Q, WS-128K32-70G2UQ
5962-9559504HMA	54230	WS-128K32-70G2Q, WS-128K32-70G2UQ
5962-9559504HNC	54230	WS-128K32-70G2UQ
5962-9559504HNA	54230	WS-128K32-70G2UQ
5962-9559504HXC	54230	WS-128K32-70G4Q
5962-9559504HXA	54230	WS-128K32-70G4Q
5962-9559504HYC	54230	WS-128K32-70G4TQ
5962-9559504HYA	54230	WS-128K32-70G4TQ
5962-9559505HMC	0EU86	AS8S128K32Q-55/883C
5962-9559505HMC	54230	WS-128K32-55G2Q, WS-128K32-55G2UQ
5962-9559505HMC	88379	ACT-S128K32N-055F2Q
5962-9559505HMA	0EU86	AS8S128K32Q-55/883C
5962-9559505HMA	54230	WS-128K32-55G2Q, WS-128K32-55G2UQ
5962-9559505HMA	88379	ACT-S128K32N-055F2Q
5962-9559505HNC	0EU86	AS8S128K32QT-55/883C
5962-9559505HNC	54230	WS-128K32-55G2UQ
5962-9559505HNA	0EU86	AS8S128K32QT-55/883C
5962-9559505HNA	54230	WS-128K32-55G2UQ
5962-9559505HXC	54230	WS-128K32-55G4Q
5962-9559505HXC	88379	ACT-S128K32N-055F1Q
5962-9559505HXA	54230	WS-128K32-55G4Q
5962-9559505HXA	88379	ACT-S128K32N-055F1Q
5962-9559505HYC	54230	WS-128K32-55G4TQ
5962-9559505HYC	88379	ACT-S128K32N-055F1Q
5962-9559505HYA	54230	WS-128K32-55G4TQ
5962-9559505HYA	88379	ACT-S128K32N-055F1Q
5962-9559505HZC	88379	ACT-S128K32N-055F2Q
5962-9559505HZA	88379	ACT-S128K32N-055F2Q

Standardized microcircuit drawing PIN 1/	Vendor CAGE number	Vendor similar PIN 2/
5962-9559506HMC	0EU86	AS8S128K32Q-45/883C
5962-9559506HMC	54230	WS-128K32-45G2Q
5962-9559506HMC	88379	ACT-S128K32N-045F2Q
5962-9559506HMA	0EU86	AS8S128K32Q-45/883C
5962-9559506HMA	54230	WS-128K32-45G2Q
5962-9559506HMA	88379	ACT-S128K32N-045F2Q
5962-9559506HNC	0EU86	AS8S128K32QT-45/883C
5962-9559506HNA	0EU86	AS8S128K32QT-45/883C
5962-9559506HXC	54230	WS-128K32-45G4Q
5962-9559506HXC	88379	ACT-S128K32N-045F1Q
5962-9559506HXA	54230	WS-128K32-45G4Q
5962-9559506HXA	88379	ACT-S128K32N-045F1Q
5962-9559506HYC	54230	WS-128K32-45G4TQ
5962-9559506HYC	88379	ACT-S128K32N-045F1Q
5962-9559506HYA	54230	WS-128K32-45G4TQ
5962-9559506HYA	88379	ACT-S128K32N-045F1Q
5962-9559506HZC	88379	ACT-S128K32N-045F2Q
5962-9559506HZA	88379	ACT-S128K32N-045F2Q
5962-9559507HMC	0EU86	AS8S128K32Q-35/883C
5962-9559507HMC	54230	WS-128K32-35G2Q
5962-9559507HMC	88379	ACT-S128K32N-035F2Q
5962-9559507HMA	0EU86	AS8S128K32Q-35/883C
5962-9559507HMA	54230	WS-128K32-35G2Q
5962-9559507HMA	88379	ACT-S128K32N-035F2Q
5962-9559507HNC	0EU86	AS8S128K32QT-35/883C
5962-9559507HNA	0EU86	AS8S128K32QT-35/883C
5962-9559507HXC	54230	WS-128K32-35G4Q
5962-9559507HXC	88379	ACT-S128K32N-035F1Q
5962-9559507HXA	54230	WS-128K32-35G4Q
5962-9559507HXA	88379	ACT-S128K32N-035F1Q
5962-9559507HYC	54230	WS-128K32-35G4TQ
5962-9559507HYC	88379	ACT-S128K32N-035F1Q
5962-9559507HYA	54230	WS-128K32-35G4TQ
5962-9559507HYA	88379	ACT-S128K32N-035F1Q
5962-9559507HZC	88379	ACT-S128K32N-035F2Q
5962-9559507HZA	88379	ACT-S128K32N-035F2Q
5962-9559508HMC	0EU86	AS8S128K32Q-25/883C
5962-9559508HMC	54230	WS-128K32-25G2Q
5962-9559508HMC	88379	ACT-S128K32N-025F2Q
5962-9559508HMA	0EU86	AS8S128K32Q-25/883C
5962-9559508HMA	54230	WS-128K32-25G2Q
5962-9559508HMA	88379	ACT-S128K32N-025F2Q
5962-9559508HNC	0EU86	AS8S128K32QT-25/883C
5962-9559508HNA	0EU86	AS8S128K32QT-25/883C
5962-9559508HXC	54230	WS-128K32-25G4Q
5962-9559508HXC	88379	ACT-S128K32N-025F1Q
5962-9559508HXA	54230	WS-128K32-25G4Q
5962-9559508HXA	54230	ACT-S128K32N-025F1Q
5962-9559508HYC	54230	WS-128K32-25G4TQ
5962-9559508HYC	88379	ACT-S128K32N-025F1Q
5962-9559508HYA	54230	WS-128K32-25G4TQ
5962-9559508HYA	88379	ACT-S128K32N-025F1Q
5962-9559508HZC	88379	ACT-S128K32N-025F2Q
5962-9559508HZA	88379	ACT-S128K32N-025F2Q

Standardized microcircuit drawing PIN 1/	Vendor CAGE number	Vendor similar PIN 2/
5962-9559509HMC	0EU86	AS8S128K32Q-20/883C
5962-9559509HMC	54230	WS-128K32-20G2Q
5962-9559509HMC	88379	ACT-S128K32N-020F2Q
5962-9559509HMA	0EU86	AS8S128K32Q-20/883C
5962-9559509HMA	54230	WS-128K32-20G2Q
5962-9559509HMA	88379	ACT-S128K32N-020F2Q
5962-9559509HNC	0EU86	AS8S128K32QT-20/883C
5962-9559509HNA	0EU86	AS8S128K32QT-20/883C
5962-9559509HXC	54230	WS-128K32-20G4Q
5962-9559509HXC	88379	ACT-S128K32N-020F1Q
5962-9559509HXA	54230	WS-128K32-20G4Q
5962-9559509HXA	88379	ACT-S128K32N-020F1Q
5962-9559509HYC	54230	WS-128K32-20G4TQ
5962-9559509HYC	88379	ACT-S128K32N-020F1Q
5962-9559509HYA	54230	WS-128K32-20G4TQ
5962-9559509HYA	88379	ACT-S128K32N-020F1Q
5962-9559509HZC	88379	ACT-S128K32N-020F2Q
5962-9559509HZA	88379	ACT-S128K32N-020F2Q
5962-9559510HMC	54230	WS-128K32-17G2Q
5962-9559510HMC	88379	ACT-S128K32N-017F2Q
5962-9559510HMA	54230	WS-128K32-17G2Q
5962-9559510HMA	88379	ACT-S128K32N-017F2Q
5962-9559510HXC	54230	WS-128K32-17G4Q
5962-9559510HXC	88379	ACT-S128K32N-017F1Q
5962-9559510HXA	54230	WS-128K32-17G4Q
5962-9559510HXA	88379	ACT-S128K32N-017F1Q
5962-9559510HYC	54230	WS-128K32-17G4TQ
5962-9559510HYC	88379	ACT-S128K32N-017F1Q
5962-9559510HYA	54230	WS-128K32-17G4TQ
5962-9559510HYA	88379	ACT-S128K32N-017F1Q
5962-9559510HZC	88379	ACT-S128K32N-017F2Q
5962-9559510HZA	88379	ACT-S128K32N-017F2Q
5962-9559511HMC	54230	WS-128K32-15G2Q
5962-9559511HMA	54230	WS-128K32-15G2Q
5962-9559511HXC	54230	WS-128K32-15G4Q
5962-9559511HXA	54230	WS-128K32-15G4Q
5962-9559511HYC	54230	WS-128K32-15G4TQ
5962-9559511HYA	54230	WS-128K32-15G4TQ

1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer list for that part. If the desired lead finish is not listed contact the vandor to determine its availability.

2/ 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
0EU86	Austin Semiconductor Incorporated 8701 Cross Park Drive Austin, TX 78754-4566
54230	White Electronic Designs Corporation 3601 East University Drive Phoenix, AZ 85034
88379	Aeroflex Circuit Technology Corporation 35 South Service Road Plainview, NY 11803-4193

The information contained herein is disseminated for convenience only and the Government assumes no liability whatsoever for any inaccuracies in this information bulletin.