REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	Change V_{OL2}, 0.5 V from min to max column. Change I_{O1} test conditions: V_{CC} from 4.5 V to 5.5 V. Correct truth table input heading from A_1 to A_i. Change vendor part number on page 12. Editorial changes throughout.	15 JAN 1987	Charles Reusing

REV																														
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REV STATUS OF PAGES	REV	A			A					A			A																	
	PAGES	1	2	3	4	5	6	7	8	9	10	11	12																	

Defense Electronics Supply Center Dayton, Ohio	PREPARED BY David W. Freeman	**MILITARY DRAWING** This drawing is available for use by all Departments and Agencies of the Department of Defense
	CHECKED BY DA Di Cenzo	
Original date of drawing: 1 October 1986	APPROVED BY M. A. Frye	TITLE: MICROCIRCUITS, DIGITAL, BIPOLAR, QUAD BUS TRANSCEIVER, MONOLITHIC SILICON
	SIZE A / CODE IDENT. NO. 14933	DWG NO. 5962-86714
AMSC N/A	REV A	PAGE 1 OF 12

5962-E247

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

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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:

5962-86714	01	R	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	2917A	Quad three-state bus transceiver with interface logic

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
R	D-8 (20-lead, 1/4" X 1 1/16"), dual-in-line package
S	F-9 (20-lead, 1/4" X 1/2"), flat package
2	C-2 (20-terminal, .350" X .350"), square chip carrier package

1.3 Absolute maximum ratings.

Supply voltage range	-0.5 V dc to +7.0 V dc
Input voltage range	-1.5 V dc to +7.0 V dc
Storage temperature range	-65°C to +150°C
Maximum power dissipation (P_D) 1/	1.24 W
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC}):	
Case R	25°C/W
Case S	20°C/W
Case 2	20°C/W
Junction temperature (T_J)	+150°C
DC input current	-30 mA to +5.0 mA
DC output current, into output (except bus)	-30 mA
DC output current, into bus	100 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_{IH})	2.0 V dc
Maximum low level input voltage (V_{IL})	0.7 V dc

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

Case operating temperature range (T_C)	-55°C to +125°C
Clock pulse width (high)	20 ns minimum
Setup time, A data inputs	15 ns minimum
Hold time, A data inputs	8 ns minimum
Setup time, bus to latch enable	15 ns minimum
Hold time, bus to latch enable	6 ns minimum

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 diagram. The logic diagram shall be as specified on figure 3.

3.2.4 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 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.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C < T_C < +125°C$ unless otherwise specified		Group A subgroups	Limits		Unit
					Min	Max	
Bus low level output voltage	V_{OL1}	V_{CC} = 4.5 V V_{IN} = 0.7 V or 2.0 V	I_{OL} = 24 mA	1, 2, 3		0.4	V
			I_{OL} = 48 mA	1, 2, 3		0.5	V
Receiver low level output voltage	V_{OL2}	V_{CC} = 4.5 V V_{IN} = 0.7 V or 2.0 V $\overline{BE}$ = 2.4 V	I_{OL} = 4.0 mA	1, 2, 3		0.4	V
			I_{OL} = 8.0 mA	1, 2, 3		0.45	V
			I_{OL} = 12.0 mA	1, 2, 3		0.5	V
Bus high level output voltage	V_{OH1}	V_{CC} = 4.5 V V_{IN} = 0.7 V or 2.0 V I_{OH} = -15 mA		1, 2, 3	2.4		V
Receiver high level output voltage	V_{OH2}	V_{CC} = 4.5 V V_{IN} = 0.7 V or 2.0 V $\overline{BE}$ = 2.4 V	I_{OH} = -1.0 mA	1, 2, 3	2.4		V
		V_{CC} = 5.0 V I_{OH} = -100 µA		1, 2, 3	3.5		V
Parity hign level output voltage	V_{OH3}	V_{CC} = 4.5 V I_{OH} = -660 µA V_{IN} = 0.7 V or 2.0 V		1, 2, 3	2.5		V
Bus leakage current (high impedance)	I_{O1}	V_{CC} = 5.5 V Bus enable = 2.4 V	V_{OUT} = 0.4 V	1, 2, 3		-200	µA
			V_{OUT} = 2.4 V	1, 2, 3		50	µA
			V_{OUT} = 4.5 V	1, 2, 3		100	µA
Bus leakage current (power off)	I_{O2}	V_{CC} = 0 V V_{OUT} = 4.5 V		1, 2, 3		100	µA

See footnote at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C < T_C < +125°C$ unless otherwise specified		Group A subgroups	Limits Min	Limits Max	Unit
Short-circuit output current	I_{OS1}	V_{CC} = 5.5 V, V_{OUT} = 0 V 1/	Bus	1, 2, 3	-50	-225	mA
	I_{OS2}		Receiver	1, 2, 3	-30	-130	mA
	I_{OS3}		Parity	1, 2, 3	-20	-100	mA
Input clamp voltage	V_{IC}	V_{CC} = 4.5 V, I_{IN} = -18 mA		1, 2, 3		-1.2	V
Low level input current	I_{IL}	V_{CC} = 5.5 V, V_{IN} = 0.4 V	$\overline{BE}$, $\overline{RLE}$	1, 2, 3		-0.72	mA
			All other inputs	1, 2, 3		-0.36	mA
High level input current	I_{IH1}	V_{CC} = 5.5 V, V_{IN} = 2.7 V		1, 2, 3		20	µA
	I_{IH2}	V_{CC} = 5.5 V, V_{IN} = 7.0 V		1, 2, 3		100	µA
Supply current	I_{CC}	V_{CC} = 5.5 V		1, 2, 3		95	mA
Off-state output current (receiver)	I_{OFF}	V_{CC} = 5.5 V	V_{OUT} = 2.4 V	1, 2, 3		50	µA
			V_{OUT} = 0.4 V	1, 2, 3		-50	µA
Functional tests		See 4.3.1c		7, 8			
Propagation delay time, driver clock (DRCP) to bus	t_{PLH1}	V_{CC} = 5.0 V ±10%, C_L = 50 pF ±10%, R_{L1} = 1.0 kΩ ±5%, R_{L2} = 130Ω ±5%		9, 10, 11		36	ns
	t_{PHL1}			9, 10, 11		36	ns

See footnote at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C < T_C < +125°C$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Propagation delay time, bus to receiver output (latch enabled)	t_{PLH2}	V_{CC} = 5.0 V ±10% C_L = 15 pF ±10% R_{L1} = 5 kΩ ±5% R_{L2} = 2 kΩ ±5%	9, 10, 11		33	ns
	t_{PHL2}		9, 10, 11		30	ns
Propagation delay time, latch enable to receiver output	t_{PLH3}		9, 10, 11		33	ns
	t_{PHL3}		9, 10, 11		30	ns
Propagation delay time, A data to odd parity out (driver enabled)	t_{PLH4}		9, 10, 11		46	ns
	t_{PHL4}		9, 10, 11		40	ns
Propagation delay time, bus to odd parity out (driver inhibit)	t_{PLH5}		9, 10, 11		36	ns
	t_{PHL5}		9, 10, 11		36	ns
Propagation delay time, latch enable to odd parity output	t_{PLH6}		9, 10, 11		36	ns
	t_{PHL6}		9, 10, 11		36	ns
Propagation delay time, bus enable to bus	t_{PZH1} t_{PZL1}	V_{CC} = 5.0 V ±10% C_L = 50 pF ±10% R_{L1} = 1 kΩ ±5% R_{L2} = 130 kΩ ±5%	9, 10, 11		26	ns
	t_{PHZ1} t_{PLZ1}		9, 10, 11		21	ns

See footnote at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C < T_C < +125°C$ unless otherwise specified	Group A subgroups	Limits		Unit
				Min	Max	
Propagation delay time, output control to output	t_{PZH2} t_{PZL2}	V_{CC} = 5.0 V ±10% C_L = 15 pF ±10% R_{L1} = 5 kΩ ±5% R_{L2} = 2 kΩ ±5%	9, 10, 11		26	ns
	t_{PHZ2} t_{PLZ2}	V_{CC} = 5.0 V ±10% C_L = 5 pF ±10% R_{L1} = 5 kΩ ±5% R_{L2} = 2 kΩ ±5%	9, 10, 11		26	ns

1/ Not more than one output should be shorted at a time, and the duration of the short-circuit condition should not exceed one second.

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 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).

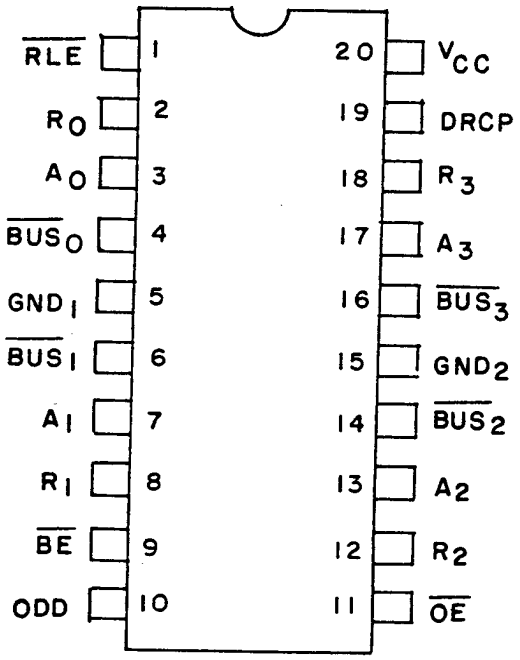
(1) Test condition A, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(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.

Cases R and S



Case 2

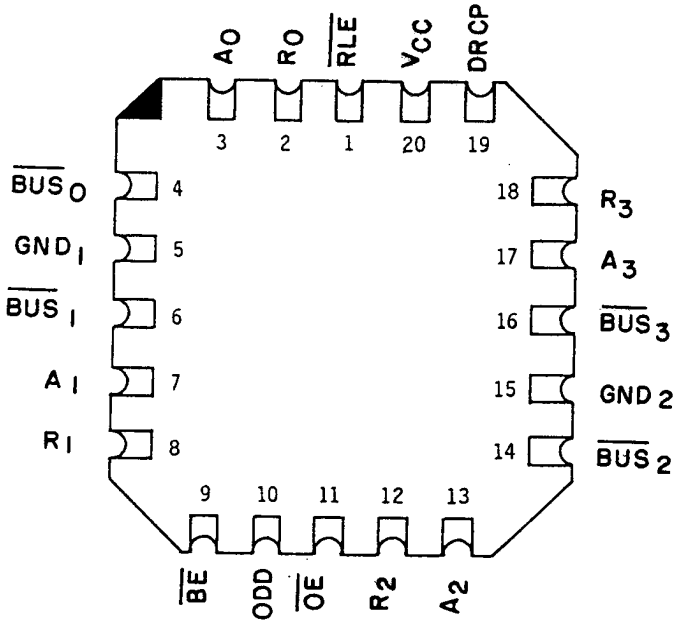


FIGURE 1. Terminal connections.

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Inputs					Internal to device		Bus	Output	
A_i	DRCP	$\overline{BE}$	$\overline{RLE}$	$\overline{OE}$	D_i	Q_i	$\overline{BUS_i}$	R_i	Function
X	X	H	X	X	X	X	Z	X	Driver output disable
X	X	X	X	H	X	X	X	Z	Receiver output disable
X X	X X	H H	L L	L L	X X	L H	L H	H L	Driver output disable and receive data via bus input
X	X	X	H	X	X	NC	X	X	Latch received data
L H	↑ ↑	X X	X X	X X	L H	X X	X X	X X	Load driver register
X X	L H	X X	X X	X X	NC NC	X X	X X	X X	No driver clock restrictions
X X	X X	L L	X X	X X	L H	X X	H L	X X	Drive bus

H = HIGH Z = HIGH Impedance X = Don't care i = 0, 1, 2, 3
L = LOW NC = No change ↑ = LOW to HIGH transition

$\overline{BE}$	Odd parity output
L	$ODD = A_0 \oplus A_1 \oplus A_2 \oplus A_3$
H	$ODD = Q_0 \oplus Q_1 \oplus Q_2 \oplus Q_3$

FIGURE 2. Truth tables.

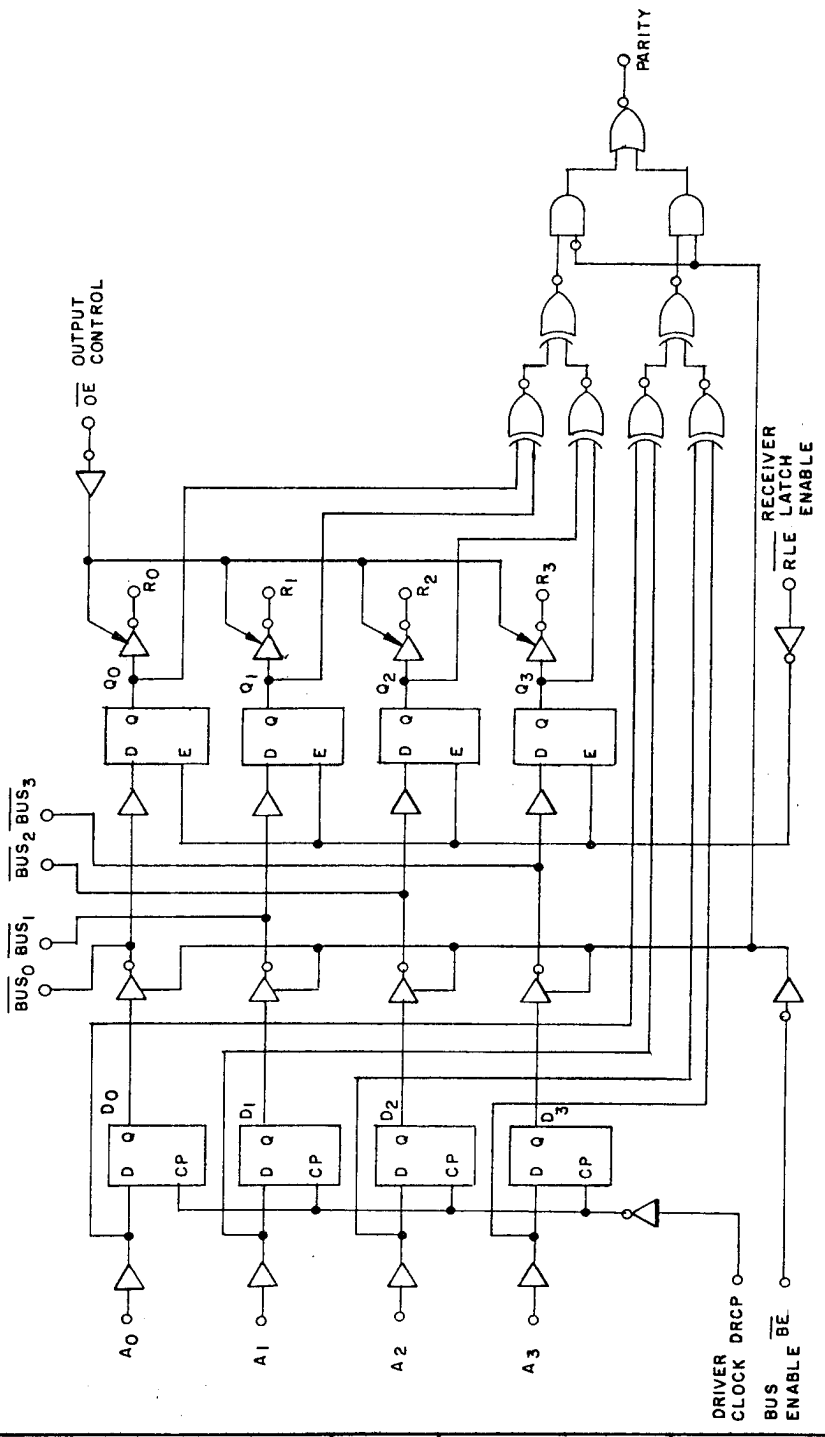

FIGURE 3. Logic diagram.

MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO	SIZE A	CODE IDENT. NO. 14933	DWG NO. 5962-86714
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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. Subgroups 7 and 8 tests shall verify the truth table.

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, C, or D using the circuit submitted with the certificate of compliance (see 3.5 herein).

(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
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

* PDA applies to subgroup 1.
** Subgroups 10 and 11, if not tested, shall be guaranteed to the limits specified in taole I.

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/
5962-8671401RX	34335	AM2917A/BRA
5962-8671401SX	34335	AM2917A/BSA
5962-86714012X	34335	AM2917A/B2A

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
34335	Advanced Micro Devices, Inc. 901 Thompson Place P.O. Box 3453 Sunnyvale, CA 94088