NOTICE OF REVISION (NOR) (See MIL-STD-480 for instructions) This revision described below has been authorized for the document listed.	DATE (YYMMDD) 91/11/22	Form Approved OMB No. 0704-0188

1. ORIGINATOR NAME AND ADDRESS Defense Electronics Supply Center Dayton, Ohio 45444-5277	2. CAGE CODE 67268	3. NOR NO. 5962-R062-92
	4. CAGE CODE 67268	5. DOCUMENT NO. 78023
6. TITLE OF DOCUMENT Microcircuit, linear, quad differential line driver, monolithics silicon.	7. REVISION LETTER (Current) K	(New) L
	8. ECP NO.	

9. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES

ALL

10. DESCRIPTION OF REVISION

Sheet 1: Revisions ltr column; add "L"
Revisions description column; add "Changes in accordance with NOR 5962-R062-92".
Revisions date column; add "91-11-22".

Sheet 3: Section 1.3, Thermal resistance, Junction-To-Ambient, (Θ_{JA}), Case outline 2, Change from: 87°C/W
to : 130°C/W.

11. THIS SECTION FOR GOVERNMENT USE ONLY

[X] CHECK ONE
EXISTING DOCUMENT SUPPLEMENTED BY THIS NOR MAY BE USED IN MANUFACTURE.

[ ] REVISED DOCUMENT MUST BE RECEIVED BEFORE MANUFACTURER MAY INCORPORATE THIS CHANGE.

[ ] CUSTODIAN OF MASTER DOCUMENT SHALL MAKE ABOVE REVISION AND FURNISH REVISED DOCUMENT TO:

b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT DESC-ECC	SIGNATURE AND TITLE CHIEF MICROELECTRONICS BRANCH	DATE (YYMMDD) 91-11-22
12. ACTIVITY ACCOMPLISHING REVISION DESC-ECC	REVISION COMPLETED (Signature) Jeffrey Tarnstall	DATE (YYMMDD) 91-11-22

DD Form 1695, JUL 88 Previous editions are obsolete.

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
G	Add vendor CAGE 27014. Change to SMD format.	87-09-16	M.A. Frye
H	Add vendor CAGE 04713 to 01FX. Change CAGE code of SMD to 67268.	88-04-12	M.A. Frye
J	Add vendor CAGE 18324.	89-01-30	M.A. Frye
K	Add device type 02 and add vendor CAGE 27014. Change to one part-one part number format. Technical changes to 1.3, 1.4, table I, and table II. Change figure 2 to figure 3. Add figure 2.	91-04-19	M.A. Frye
L	CHANGES IN ACCORDANCE WITH NOR 5962-R062-92	91-11-22	

Standardized military drawing 78023, revision K, has been prepared as a fully characterized military detail specification, MIL-M-38510/78023, and is suitable for qualification of device classes B and S to the requirements of MIL-M-38510.

CURRENT CAGE CODE 67268

REV																							
SHEET																							
REV																							
SHEET																							
REV STATUS OF SHEETS	REV	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K	K						
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16						

PMIC N/A

STANDARDIZED MILITARY DRAWING

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

AMSC N/A

PREPARED BY: Monica L Poelking

CHECKED BY: Charles E. Besore

APPROVED BY: Michael A. Frye

DRAWING APPROVAL DATE: 79-02-02

REVISION LEVEL: K

DEFENSE ELECTRONICS SUPPLY CENTER
DAYTON, OHIO 45444

MICROCIRCUITS, LINEAR, QUAD HIGH SPEED DIFFERENTIAL LINE DRIVER, MONOLITHIC SILICON

SIZE	CAGE CODE	
A	14933	78023

SHEET 1 OF 16

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* U.S. GOVERNMENT PRINTING OFFICE: 1987 — 748-129/60912

5962-E1840

1. SCOPE

1.1 Scope. This drawing forms a part of a one part - one part number documentation system (see 6.6 herein). Two product assurance classes consisting of military high reliability (device classes B, Q, and M) and space application (device classes S and V), and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). Device class M microcircuits represent non-JAN 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". When available, a choice of radiation hardness assurance (RHA) levels are reflected in the PIN.

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

5962	-	78023	01	M	E	X
Federal stock class designator	RHA designator (See 1.2.1)	Drawing number	Device type (See 1.2.2)	Device class designator (See 1.2.3)	Case outline (See 1.2.4)	Lead finish (See 1.2.5)

1.2.1 Radiation hardness assurance (RHA) designator. Device classes M, B, and S RHA marked devices shall meet the MIL-M-38510 specified RHA levels and shall be marked with the appropriate RHA designator. Device classes Q and V RHA marked devices shall meet the MIL-I-38535 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
01	26LS31	Quad, high speed, differential line driver
02	26F31	Quad, high speed, differential line driver

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

Device class	Device requirements documentation
M	Vendor self-certification to the requirements for non-JAN class B microcircuits in accordance with 1.2.1 of MIL-STD-883
B or S	Certification and qualification to MIL-M-38510
Q or V	Certification and qualification to MIL-I-38535

1.2.4 Case outline(s). For device classes M, B, and S, case outline(s) shall meet the requirements in appendix C of MIL-M-38510 and as listed below. For device classes Q and V, case outline(s) shall meet the requirements of MIL-I-38535, appendix C of MIL-M-38510, and as listed below.

Outline 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

1.2.5 Lead finish. The lead finish shall be as specified in MIL-M-38510 for classes M, B, and S or MIL-I-38535 for classes Q and V. Finish letter "X" shall not be marked on the microcircuit or its packaging. The "X" designation is for use in specifications when lead finishes A, B, and C are considered acceptable and interchangeable without preference.

1.3 Absolute maximum ratings. 1/

Power supply and input voltage	7.0 V dc
Output voltage	5.5 V dc
Storage temperature range	-65°C to +150°C
Lead temperature (soldering, 10 seconds)	+300°C
Maximum power dissipation (P_D)	450 mW 2/
Thermal resistance, junction-to-case (θ_{JC})	See MIL-M-38510, appendix C
Thermal resistance, junction-to-ambient (θ_{JA}):	
Case E	100°C/W
Case F	142°C/W
Case 2	~~87°C/W~~ 130°C/W per NOR
Junction temperature (T_J)	+150°C

1.4 Recommended operating conditions.

Supply voltage range (V_{CC})	4.5 V dc to 5.5 V dc
Minimum high-level input voltage (V_{IH})	2.0 V dc
Maximum low-level input voltage (V_{IL})	0.8 V dc
Ambient operating temperature range (T_A)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specifications, standards, bulletin, and handbook. Unless otherwise specified, the following specifications, standards, bulletin, and handbook 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.

SPECIFICATIONS

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.
MIL-I-38535 - Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

MILITARY

MIL-STD-480 - Configuration Control-Engineering Changes, Deviations and Waivers.
MIL-STD-883 - Test Methods and Procedures for Microelectronics.

BULLETIN

MILITARY

MIL-BUL-103 - List of Standardized Military Drawings (SMD's).

1/ 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.

2/ Must withstand the added P_D due to short circuit test; e.g., I_{OS}.

STANDARDIZED MILITARY DRAWING	SIZE A		78023
DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444		REVISION LEVEL K	SHEET 3

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HANDBOOK

MILITARY

MIL-HDBK-780 - Standardized Military Drawings.

(Copies of the specifications, standards, bulletin, and handbook 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 for device class M 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. The individual item requirements for device classes B and S shall be in accordance with MIL-M-38510 and as specified herein. This is a full military detail specification and is suitable for qualification of device classes B and S to the requirements of MIL-M-38510. The individual item requirements for device classes Q and V shall be in accordance with MIL-I-38535, the device manufacturer's Quality Management (QM) plan, 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 for device classes M, B, and S and MIL-I-38535 for device classes Q and V and herein.

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

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.3 Block or logic diagram. The block or logic diagram shall be as specified on figure 2.

3.2.4 Test circuit and switching waveforms. The test circuit and switching waveforms shall be as specified on figure 3.

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

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

3.5 Marking. The part shall be marked with the PIN listed in 1.2 herein. Marking for device class M shall be in accordance with MIL-STD-883 (see 3.1 herein). In addition, the manufacturer's PIN may also be marked as listed in MIL-BUL-103. Marking for device classes B and S shall be in accordance with MIL-M-38510. Marking for device classes Q and V shall be in accordance with MIL-I-38535.

3.5.1 Certification/compliance mark. The compliance mark for device class M shall be a "C" as required in MIL-STD-883 (see 3.1 herein). The certification mark for device classes B and S shall be a "J" or "JAN" as required in MIL-M-38510. The certification mark for device classes Q and V shall be a "QML" as required in MIL-I-38535.

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3.6 Certificate of compliance. For device class M a certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-BUL-103 (see 6.7.3 herein). For device classes Q and V a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.7.2 herein). The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device class M the requirements of MIL-STD-883 (see 3.1 herein), or for device classes Q and V, the requirements of MIL-I-38535 and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required for device class M in MIL-STD-883 (see 3.1 herein) or device classes B and S in MIL-M-38510 or for device classes Q and V in MIL-I-38535 shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M notification to DESC-ECS of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change as defined in MIL-STD-480.

3.9 Verification and review for device class M. For device class M, 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.

3.10 Microcircuit group assignment for device classes M, B, and S. Device classes M, B, or S devices covered by this drawing shall be in microcircuit group number 53 (see MIL-M-38510, appendix E).

3.11 Serialization for device class S. All device class S devices shall be serialized in accordance with MIL-M-38510.

3.12 PIN supersession information. The PIN supersession information shall be as specified in the appendix.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. For device class M, 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). For device classes B and S, sampling and inspection procedures shall be in accordance with MIL-M-38510 and method 5005 of MIL-STD-883, except as modified herein. For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-I-38535 and the device manufacturer's QM plan.

4.2 Screening. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. For device classes B and S, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to qualification and quality conformance inspection. For device classes Q and V, screening shall be in accordance with MIL-I-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection.

TABLE I. Electrical performance characteristics.

Test (MIL-STD-883 test method)	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits Min	Limits Max	Unit
Output high voltage (3006)	V_{OH}	V_{CC} = 4.5 V, I_{OH} = -20 mA	1, 2, 3	All	2.5		V
Output low voltage (3007)	V_{OL}	V_{CC} = 4.5 V, I_{OL} = 20 mA	1, 2, 3	All		0.5	V
Input high voltage	V_{IH}	V_{CC} = 4.5 V 1/	1, 2, 3	All	2.0		V
Input low voltage	V_{IL}	V_{CC} = 5.5 V 1/	1, 2, 3	All		0.8	V
Input low current (3009)	I_{IL}	V_{CC} = 5.5 V, V_{IN} = 0.4 V 2/	1, 2, 3	01	0.10	-0.36	mA
				02	0.10	-0.20	
Input high current (3010)	I_{IH}	V_{CC} = 5.5 V, V_{IN} = 2.7 V 2/	1, 2, 3	All	-2.0	20	µA
Input reverse current	I_I	V_{CC} = 5.5 V, V_{IN} = 7.0 V 2/	1, 2, 3	All	-0.01	0.1	mA
Off-state (high impedance) output current (3020, 3021)	I_O	V_{CC} = 5.5 V, V_O = 2.5 V	1, 2, 3	All		20	µA
		V_{CC} = 5.5 V, V_O = 0.5 V				-20	
Input clamp voltage (3022)	V_I	V_{CC} = 4.5 V, I_{IN} = -18 mA	1, 2, 3	All		-1.5	V
Output short circuit current (3011)	I_{OS}	V_{CC} = 5.5 V 3/	1, 2, 3	All	-30	-150	mA
Power supply current (3005)	I_{CC}	V_{CC} = 5.5 V, All outputs disabled	1, 2, 3	01		80	mA
				02		50	
		V_{CC} = 5.5 V, All outputs enabled		02		40	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test (MIL-STD-883 test method)	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits Min	Limits Max	Unit
Propagation delay, output to output	t_{SKEW}	V_{CC} = 5.0 V 4/ C_L = 30 pF	9	01		6.0	ns
			10,11			9.0	
			9	02 5/		4.5	
			10,11			7.0	
		C_L = 50 pF	9	02		6.0	
			10,11			9.0	
Propagation delay, input to output (3003)	t_{PLH}	V_{CC} = 5.0 V 4/ C_L = 30 pF See figure 3	9	01		20	ns
			10,11			30	
			9	02 5/		15	
			10,11			23	
		C_L = 50 pF	9	02		16	
			10,11			24	
	t_{PHL}	V_{CC} = 5.0 V 4/ C_L = 30 pF See figure 3	9	01		20	ns
			10,11			30	
			9	02 5/		15	
			10,11			23	
		C_L = 50 pF	9	02		17	
			10,11			25	
Output disable time, ENABLE to output (3003)	t_{PLZ}	V_{CC} = 5.0 V 4/ C_L = 10 pF See figure 3	9	01		35	ns
			10,11			53	
			9	02 5/		35	
			10,11			53	
		C_L = 50 pF	9	02		38	
			10,11			56	
	t_{PHZ}	V_{CC} = 5.0 V 4/ C_L = 10 pF See figure 3	9	01		30	ns
			10,11			45	
			9	02 5/		20	
			10,11			27	
		C_L = 50 pF	9	02		23	
			10,11			30	

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits Min	Limits Max	Unit
Output enable time, ENABLE to output	t_{PZL}	V_{CC} = 5.0 V 4/, C_L = 30 pF, See figure 3	9, 10,11	01		45, 68	ns
			9, 10,11	02 5/		25, 37	
		C_L = 50 pF	9, 10,11	02		28, 40	
	t_{PZH}	V_{CC} = 5.0 V 4/, C_L = 30 pF, See figure 3	9, 10,11	01		40, 60	ns
			9, 10,11	02 5/		30, 50	
		C_L = 50 pF	9, 10,11	02		32, 52	

1/ V_{IH} and V_{IL} tests are not required and shall be applied as forcing functions for the V_{OH} and V_{OL} tests.
2/ The minimum limits apply to device classes B, S, Q, and V. For device class M, these limits are not tested. The limits specified for the input low current represents the numerical range in which this parameter will pass:
Device type 01: -0.36 to -0.10
Device type 02: -0.20 to +0.10
3/ Not more than one output should be shorted at one time, and the duration of the short circuit condition should not exceed 1 second.
4/ V_{IH} = 1.3 V to V_O = 1.3 V, V_{PULSE} = 0 V to +3.0 V.
5/ This parameter is guaranteed by correlation to the testing at C_L = 50 pF.

4.2.1 Additional criteria for device classes M, B, and S.

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

(1) Test condition A, B, C, or D. For device class M, the test circuit shall be submitted to DESC-ECS for review with the certificate of compliance. For device classes B and S, the test circuit shall be submitted to the qualifying activity.

(2) T_A = +125°C, minimum.

b. Interim and final electrical test parameters shall be as specified in table IIA herein.

4.2.2 Additional criteria for device classes Q and V.

a. The burn-in test duration, test condition and test temperature or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-I-38535. The burn-in test circuit shall be submitted to DESC-ECS with the certificate of compliance and shall be under the control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-I-38535.

b. Interim and final electrical test parameters shall be as specified in table IIA herein.

c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in appendix B of MIL-I-38535 and as detailed in table IIB herein.

4.3 Qualification inspection.

4.3.1 Qualification inspection for device classes B and S. Qualification inspection for device classes B and S shall be in accordance with MIL-M-38510. Inspections to be performed shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.3.2 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-I-38535. Inspections to be performed shall be those specified in MIL-I-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5).

4.4 Conformance inspection. Quality conformance inspection for device class M shall be in accordance with MIL-STD-883 (see 3.1 herein) and as specified herein. Quality conformance inspection for device classes B and S shall be in accordance with MIL-M-38510 and as specified herein. Inspections to be performed for device classes M, B, and S shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.5). Technology conformance inspection for classes Q and V shall be in accordance with MIL-I-38535 including groups A, B, C, D, and E inspections and as specified herein except where option 2 of MIL-I-38535 permits alternate in-line control testing.

4.4.1 Group A inspection. Tests shall be as specified in table IIA herein.

4.4.2 Group B inspection. The group B inspection end-point electrical parameters shall be as specified in table IIA herein.

4.4.3 Group C inspection. End-point electrical parameters shall be as specified in table IIA herein.

4.4.3.1 Additional criteria for device classes M, B, and S. Steady-state life test conditions, method 1005 of MIL-STD-883.

a. Test condition A, B, C or D. For device class M, the test circuit shall be submitted to DESC-ECS for review with the certificate of compliance. For device classes B and S, the test circuit shall be submitted to the qualifying activity.

b. T_A = +125°C, minimum.

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

4.4.3.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-I-38535. The steady-state life test circuit shall be submitted to DESC-ECS with the certificate of compliance and shall be under the control of the device manufacturer's TRB in accordance with MIL-I-38535.

4.4.4 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table IIA herein.

Case outlines	?	E and F
Device type	01 and 02	
Terminal number	Terminal symbol	
1	N/C	INPUT A
2	INPUT A	OUTPUT A+
3	OUTPUT A+	OUTPUT A-
4	OUTPUT A-	ENABLE
5	ENABLE	OUTPUT B-
6	N/C	OUTPUT B+
7	OUTPUT B-	INPUT B
8	OUTPUT B+	GND
9	INPUT B	INPUT C
10	GND	OUTPUT C+
11	N/C	OUTPUT C-
12	INPUT C	$\overline{\text{ENABLE}}$
13	OUTPUT C+	OUTPUT D-
14	OUTPUT C-	OUTPUT D+
15	$\overline{\text{ENABLE}}$	INPUT D
16	N/C	V_{CC}
17	OUTPUT D-	---
18	OUTPUT D+	---
19	INPUT D	---
20	V_{CC}	---

N/C = No internal connection

FIGURE 1. Terminal connections.

Case outlines E and F

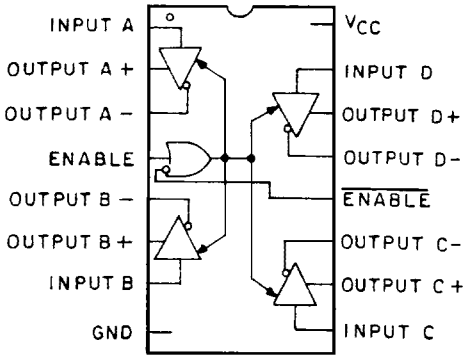

FIGURE 2. Block diagram.

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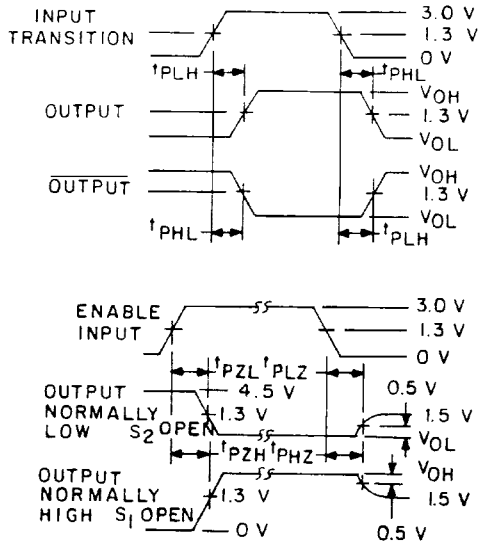
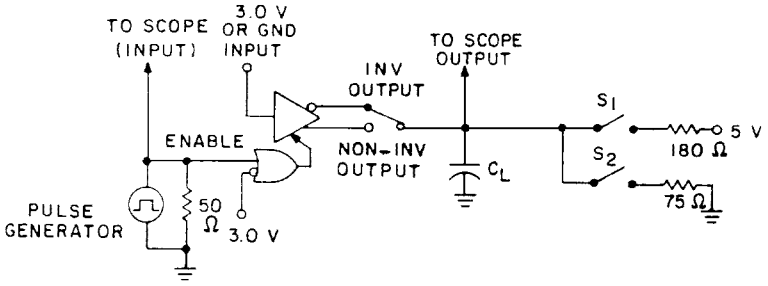


Three-state test circuit or equivalent



NOTE: Pulse generator characteristics:
$Z_0 = 50\Omega$
PRR $\leq$ 1.0 MHz
t_r , $t_f \leq 6$ ns
C_L includes probe and jig capacitance.

FIGURE 3. Test circuit and switching waveforms.

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TABLE IIA. Electrical test requirements.

Test requirements	Subgroups (per method 5005, table I)			Subgroups (per MIL-I-38535, table III)	
	Device class M	Device class B	Device class S	Device class Q	Device class V
Interim electrical parameters (see 4.2)	1	1	1	1	1
Final electrical parameters (see 4.2)	1,2,3,9 1/	1,2,3,9 1/	1,2,3,9 2/	1,2,3,9 1/	1,2,3,9 2/
Group A test requirements (see 4.4)	1,2,3,9, 10,11 3/	1,2,3,9, 10,11	1,2,3,9, 10,11	1,2,3,9, 10,11	1,2,3,9, 10,11
Group B end-point electrical parameters (see 4.4)			1,2,3		1,2,3
Group C end-point electrical parameters (see 4.4)	1,2,3	1,2,3		1,2,3	
Group D end-point electrical parameters (see 4.4)	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3
Group E end-point electrical parameters (see 4.4)					

1/ PDA applies to subgroup 1.
2/ PDA applies to subgroup 1 and delta limits. Delta limits shall be in accordance with table IIC and shall be computed with reference to the previous interim electrical parameters.
3/ Subgroups 10 and 11, if not tested, shall be guaranteed to the specified limits in table I.

4.4.5 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein). RHA levels for device classes B, S, Q, and V shall be M, D, R, and H and for device class M shall be M and D. RHA quality conformance inspection sample tests shall be performed at the RHA level specified in the acquisition document.

a. RHA tests for device classes B and S for levels M, D, R, and H or for device class M for levels M and D shall be performed through each level to determine at what levels the devices meet the RHA requirements. These RHA tests shall be performed for initial qualification and after design or process changes which may affect the RHA performance of the device.

b. End-point electrical parameters shall be as specified in table IIA herein.

c. Prior to total dose irradiation, each selected sample shall be assembled in its qualified package. It shall pass the specified group A electrical parameters in table I for subgroups specified in table IIA herein.

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d. For device classes M, B, and S, the devices shall be subjected to radiation hardness assured tests as specified in MIL-M-38510 for RHA level being tested, and meet the postirradiation end-point electrical parameter limits as defined in table I at T_A = +25°C ±5 percent, after exposure.

e. Prior to and during total dose irradiation testing, the devices shall be biased to establish a worst case condition as specified in the radiation exposure circuit.

f. For device classes M, B, and S, subgroups 1 and 2 in table V, method 5005 of MIL-STD-883 shall be tested as appropriate for device construction.

g. When specified in the purchase order or contract, a copy of the RHA delta limits shall be supplied.

TABLE IIB. Additional screening for device class V.

Test	MIL-STD-883, test method	Lot requirement
Particle impact noise detection	2020	100%
Internal visual	2010, condition A or approved alternate	100%
Nondestructive bond pull	2023 or approved alternate	100%
Reverse bias burn-in	1015	100%
Burn-in	1015, total of 240 hours at +125°C	100%
Radiographic	2012	100%

TABLE IIC. Delta limits at +25°C.

Parameter 1/	Device type	Limit
V_{OH}	All	≤ 250 mV
V_{OL}	All	≤ 50 mV
I_{CC}	All	≤ 8 mA

1/ These parameters shall be read and recorded at T_A = +25°C before and after each burn-in and shall not change by more than the limits indicated. The delta rejects shall be included in the PDA calculation.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510 for device classes M, B, and S and MIL-I-38535 for device classes Q and V.

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.

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

6.1.2 Substitutability. Device classes B and Q devices will replace device class M devices.

6.2 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-481 using DD Form 1693, Engineering Change Proposal (Short Form).

6.3 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and which SMD's are applicable to that system. DESC 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 DESC-ECS, telephone (513) 296-6022.

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

6.5 Symbols, definitions, and functional descriptions.

GND	Ground zero voltage potential.
I_{CC}	Quiescent supply current.
I_{IL}	Input current low.
I_{IH}	Input current high.
T_C	Case temperature.
T_A	Ambient temperature.
V_{CC}	Positive supply voltage.
V_{IC}	Input clamp voltage.

6.6 One part - one part number system. The one part - one part number system described below has been developed to allow for transitions between identical generic devices covered by the four major microcircuit requirements documents (MIL-M-38510, MIL-H-38534, MIL-I-38535, and 1.2.1 of MIL-STD-883) without the necessity for the generation of unique PINs. The four military requirements documents represent different class levels, and previously when a device manufacturer upgraded military product from one class level to another, the benefits of the upgraded product were unavailable to the Original Equipment Manufacturer (OEM), that was contractually locked into the original unique PIN. By establishing a one part number system covering all four documents, the OEM can acquire to the highest class level available for a given generic device to meet system needs without modifying the original contract parts selection criteria.

Military documentation format	Example PIN under new system	Manufacturing source listing	Document listing
New MIL-M-38510 Military Detail Specifications (in the SMD format)	5962-XXXXXZZ(B or S)YY	QPL-38510 (Part 1 or 2)	MIL-BUL-103
New MIL-H-38534 Standardized Military Drawings	5962-XXXXXZZ(H or K)YY	QML-38534	MIL-BUL-103
New MIL-I-38535 Standardized Military Drawings	5962-XXXXXZZ(Q or V)YY	QML-38535	MIL-BUL-103
New 1.2.1 of MIL-STD-883 Standardized Military Drawings	5962-XXXXXZZ(M)YY	MIL-BUL-103	MIL-BUL-103

6.7 Sources of supply.

6.7.1 Sources of supply for device classes B and S. Sources of supply for device classes B and S are listed in QPL-38510.

6.7.2 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DESC-ECS and have agreed to this drawing.

6.7.3 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-BUL-103. The vendors listed in MIL-BUL-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-ECS.

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APPENDIX

10. SCOPE

10.1 Scope. This appendix contains the PIN supersession information to support the one part-one part number system. For new system designs, after the date of this document the new PIN shall be used in lieu of the old PIN. For existing system designs prior to the date of this document the new PIN can be used in lieu of the old PIN. This is a mandatory part of the document. The information contained herein is intended for compliance. The PIN supersession data shall be as in 30.

20. APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

30. SUPERSESSION DATA

New PIN	Old PIN
5962-7802301MEX	7802301EX
5962-7802301MFX	7802301FX
5962-7802301M2X	78023012X

STANDARDIZED MILITARY DRAWING SOURCE APPROVAL BULLETIN

DATE: 91-04-19

Approved sources of supply for SMD 78023 are listed below for immediate acquisition only and shall be added to MIL-BUL-103 during the next revision. MIL-BUL-103 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 DESC-ECS. This bulletin is superseded by the next dated revision of MIL-BUL-103.

Standardized military drawing PIN	Vendor CAGE number	Vendor similar PIN 1/
5962-7802301MEX	04713	26LS31/BEAJC
	18324	26LS31/BEA
	27014	DS26LS31MJ/883
	34335	AM26LS31/BEA
5962-7802301MFX	04713	26LS31/BFAJC
	18324	26LS31/BFA
	27014	DS26LS31MW/883
	34335	AM26LS31/BFA
5962-7802301M2X	04713	26LS31M/B2AJC
	18324	26LS31/B2A
	34335	AM26LS31/B2A
5962-7802302MEX	27014	DS26F31MJ/883
5962-7802302MFX	27014	DS26F31MW/883
5962-7802302M2X	27014	DS26F31ME/883

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

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

Vendor CAGE number	Vendor name and address
04713	Motorola, Incorporated 5005 E. McDowell Road Phoenix, AZ 85008 Point of contact: 2100 E. Elliot Road Tempe, AZ 85284
18324	Signetics Corporation 1275 S. 800 East Street Orem, UT 84058 Point of contact: 811 E. Arques Avenue Sunnyvale, CA 94086
27014	National Semiconductor 2900 Semiconductor Drive Santa Clara, CA 95051
34335	Advanced Micro Devices, Incorporated P.O. Box 3453 901 Thompson Place Sunnyvale, CA 94088

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