	REVISION (NOR)		1. DATE (YYMMDD) 93-12-22	Form Approved OMB No. 0704-0188					
This revision described below has been Public reporting burden for this colle the time for reviewing instructions, so data needed, and completing and review this burden estimate or any other aspe	en authorized for the document ection is estimated to average earching existing data source ing the collection of inform ect of this collection of inf	e 2 hours per res es, gathering and ation. Send comm ormation, includi	ponse, including maintaining the ents regarding ng suggestions	2. PROCURING ACTIVITY NO.					
Public reporting burden for this colle the time for reviewing instructions, s data needed, and completing and review this burden estimate or any other aspe for reducing this burden, to Departmen for Information Operations and Reports 22202-4302, and to the Office of Manag Washington, DC 20503. PLEASE DO NOT R RETURN COMPLETED FORM TO THE GOVERNMEN ACTIVITY NUMBER LISTED IN ITEM 2 OF TH	, 1215 Jefferson Davis Highw ement and Budget, Paperwork ETURN YOUR COMPLETED FORM TO T ISSUING CONTRACTING OFFICE IS FORM.	ay, Suite 1204, A Reduction Project EITHER OF THESE, R FOR THE CONTRAC	rlington, VA (0704-0188), ADDRESSED. T/ PROCURING	3. DODAAC					
4. ORIGINATOR	b. ADDRESS (Street, City,	State, Zip Code)	5. CAGE CODE	6. NOR NO.					
a. TYPED NAME (First, Middle Initial,	Defense Electronics Sup 1507 Wilmington Pike	ply Center	67268 7. CAGE CODE	5962-R069-94 8. DOCUMENT NO.					
Last)	Dayton, OH 45444-5270		67268	5962-89506					
9. TITLE OF DOCUMENT		10. REVISION LE	TTER	11. ECP NO.					
MICROCIRCUIT, DIGITAL, FAST CMOS, B	US DRIVER,	a. CURRENT	b. NEW	1 1/4					
MONOLITHIC SILICON		Initial	Α	N/A					
12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES ALL									
13. DESCRIPTION OF REVISION									
Sheet 1: Revisions ltr column; add "A". Revisions description column; add "Changes in accordance with NOR 5962-R069-94". Revisions date column; add "93-12-22". Revision level block; add "A". Rev status of sheets; for sheets 1 and 6, add "A". Sheet 6: Table I, output disable time, OE to Y _n , t _{pHZ} and t _{pLZ} , C _L = 50 pF, device type 02; change maximum limit from "7.0 ns" to "8.0 ns". C _L = 5.0 pF, device type 01; change maximum limit from "19.0 ns" to "9.0 ns". C _L = 5.0 pF, device type 02; change maximum limit from "8.0 ns" to "7.0 ns". Revision level block; add "A".									
14. THIS SECTION FOR GOVERNMENT USE ON	LY								
a. (X one) X (1) Existing (document supplemented by the	NOR may be used i	n manufacture.						
(2) Revised do	ocument must be received befo	re manufacturer m	ay incorporate thi	s change.					
(3) Custodian	of master document shall mak	e above revision	and furnish revise	d document.					
b. ACTIVITY AUTHORIZED TO APPROVE CHANG	GE FOR GOVERNMENT	c. TYPED NAME (F	irst, Middle Initi	al, Last)					
DESC-ECC	T CANATURE	Monica L. Poe							
d. TITLE	e. SIGNATURE		<pre>f. DATE SIGNED (YYMMDD)</pre>						
Chief, Custom Microelectronics	Monica L. Poelking		93-12-22						
15a. ACTIVITY ACCOMPLISHING REVISION	b. REVISION COMPLETED (Sign	nature)	c. DATE SIGNED (YYMMDD)						
DESC-ECC	Thanh V. Nguyen		93-12-22						

DESC-ECC

Thanh V. Nguyen

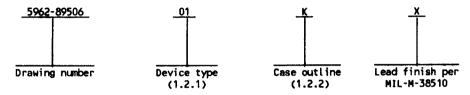
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PMIC N/A STANDARI MILITA	STANDARDIZED MILITARY PREPARED BY Morrow L. Polying CHECKED BY Van Change				9 10 11 12 13 14 DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 MICROCIRCUIT, DIGITAL, FAST CMOS, BUS DRIVER,																			
DRAWI THIS DRAWING IS FOR USE BY ALL D AND AGENCIE DEPARTMENT O AMSC N/A	S AVAILA DEPARTI	MENT HE	rs	DRZ	DRAWING APPROVAL DATE 18 MAY 1989 REVISION LEVEL				MONOLITHIC SILICON SIZE CAGE CODE 67268 SHEET 1 OF 14					89	506									

DESC FORM 193 SEP 87

1. SCOPE

1.1 <u>Scope</u>. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 <u>Device types</u>. The device types shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	54FCT827A	10-bit non-inverting bus driver
02	54FCT827B	10-bit non-inverting bus driver

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

Outline letter	<u>Case outline</u>
K	F-6 (24-lead, .640" X .420" X .090"), flat package
L	D-9 (24-lead, 1.280" X .310" X .200"), dual-in-line package
7	C-4 (28-terminal ASON Y ASON Y 100%) square chip carrier package

1.3 Absolute maximum ratings. 1/

Supply voltage range	-0.5 V dc to +6.0 V dc
Input voltage range	-0.5 V dc to V _{CC} + 0.5 V dc
Output voltage range	-0.5 V dc to V _{CC} + 0.5 V dc
DC input diode current (I _{IK})	-20 mA
DC output diode current (I _{OK})	-50 mA
DC output current	±100 mA
Maximum power dissipation (Pp) 2/	500 mW
Thermal resistance, junction-to-case (θ _{JC})	See MIL-M-38510, appendix C
Storage temperature range	-65°C to +150°C
Junction temperature (T _J)	+175°C
Lead temperature (soldering, 10 seconds)	+300°C

 $\underline{1}$ / All voltages referenced to GND.

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

STANDARDIZED MILITARY DRAWING

DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444

SIZE A		5962-89	9506	
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1.4 Recommended operating conditions.

2. APPLICABLE DOCUMENTS

2.1 <u>Government specification and standard</u>. 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 <u>Order of precedence</u>. 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 <u>Item requirements</u>. 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 <u>Design, construction, and physical dimensions</u>. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.
 - 3.2.1 <u>Terminal connections</u>. 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.
- 3.2.3 <u>Test circuit and switching waveforms</u>. The test circuit and switching waveforms 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 <u>Electrical performance characteristics</u>. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full case operating temperature range.

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TABLE I. <u>Electrical performance characteristics</u>.

					 			
Test	Symbol	Condit	Group A subgroups	Device type		mi ts	Unit	
		-55°C < T V _{CC} = 5.0°V unless otherw	-55°C < T < +125°C V _{CC} = 5.0°V dc ±10% unless otherwise specified			Min	Max	
High level output voltage	VOH	V _{CC} = 4.5 V, V _{II} = 0.8 V,	1 ₀ = -300 μA	1,2,3	ALL	4.3		v
		VIL = 2.0 V	I _O = -12 mA	1,2,3	All	2.4		
Low level output voltage	v _{OL}	V _{CC} = 4.5 V, VIL = 0.8 V, VIH = 2.0 V	ι _O = 300 μA	1,2,3	All		0.2	
		VIH = 2.0 V	I _O = 32 mA	1,2,3	ALL		0.5	
Input clamp voltage	v _{IK}	V _{CC} = 4.5 V, I _{IN} = -18 mA		1	ALL		-1.2	
High level input current	IH	v _{CC} = 5.5 v, v _{IN} =	1,2,3	ALL		5.0	μΑ	
Low level input current	IIL	v _{CC} = 5.5 v, v _{IN} =	1,2,3	ALL		-5.0		
Off-state output current	I _{OZH}	V _{CC} = 5.5 V, V _{IN} =	5.5 V	1,2,3	All		10	Ī
	I _{OZL}	v _{CC} = 5.5 V, V _{IN} =	GND				- 10	
Short circuit output current	los	v _{cc} = 5.5 v, v _{out} =	= GND <u>1</u> /	1,2,3	All	-75		mA
Quiescent power supply current (CMOS inputs)	ICCQ	V _{IN} ≤ 0.2 V or V _{IN} ≤ 5.5 V, f _I = 0.2 V or V _{IN} (cc = 5.5 V, f _I = 0.2 V or V	1,2,3	All		1.5		
Quiescent power supply current (TTL inputs)	delta ^I cc	v _{CC} = 5.5 v, v _{IN} =	V _{CC} = 5.5 V, V _{IN} = 3.4 V <u>2</u> /				2.0	
								

See footnotes at end of table.

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TABLE I. <u>Electrical performance characteristics</u> - Continued.

Test	Symbol	Condition	ons	Group A	Device	Lii	mits	Unit
	,	-55°C < T V _{CC} = 5.0°V unless otherwi	<pre>< +125°C dc ±10% ise specified</pre>	subgroups	type	Min	Max	
Dynamic power supply current	I cco	$V_{CC} = 5.5 \text{ V}, \overline{OE} = 0$ $V_{IN} \ge 5.3 \text{ V or V}_{IN}$ Outputs open, One bit toggling,	<u>3</u> /	All		0.25	mA, MH:	
Total power supply current 4/	1 _{cc}	$V_{IN} \ge 5.3 \text{ V or } V_{IN} \ge 5.5 \text{ V, } f_1 = 0.00 \text{ CC}$ Outputs open, Cone bit toggling, 5	1,2,3	All		4.0	mA	
		V _{IN} = 3.4 V or V _{IN} V _{IN} = 5.5 V, f _I = 0 Outputs open, 0 One bit toggling, 5				5.0		
Functional tests		See 4.3.1d		7,8	All			
Input capacitance	CIN	See 4.3.1c		4	All		10	pF
Output capacitance	COUT	See 4.3.1c		4	All		12	
Propagation delay	t _{PLH} ,	R ₁ = 500Ω, See figure 3	c _L = 50 pF	9,10,11	01		10	ns
n n	PIL				02		6.5	
			C _L = 300 pF <u>5</u> /	9,10,11	01		17	
					02		14	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditio -55°C < T < V _{CC} = 5.0°V o unless otherwi	Group A subgroups	Device type	<u>Lir</u> Min	nits Max	Unit	
Output enable time, OE to Yn	t _{PZH} ,	1	C _L = 50 pF	9,10,11	01		17	ns
"	F2L				02		9.0	
			C _L = 300 pF <u>5</u> /	9,10,11	01		25	
					02		16	
Ou <u>tp</u> ut disable time, OE to Yn	t _{PHZ} ,		C _L = 50 pF	9,10,11	01		10	
· ·	,				02		7.0	
			C _L = 5.0 pF <u>5</u> /	9,10,11	01		19	
					02		8.0	

- 1/ Not more than one output should be shorted at one time, and the duration of the short circuit condition shall not exceed 1 second.
- $\underline{2}/$ TTL driven input, V_{IN} = 3.4 V; all other inputs at V_{CC} or GND.
- 3/ This parameter is not directly testable, but is derived for use in total power supply calculations.

$$\frac{4}{I_{CC}} = I_{CCQ} + (delta I_{CC} \times D_H \times N_T) + (I_{CCD} \times f_I \times N_I)$$

where D_{H} = Duty cycle for TTL inputs high

 N_T = Number of TTL inputs at D_{μ}

 f_{I} = Input frequency in MHz

 $N_1 = Number of inputs at f_1$

5/ This parameter is guaranteed, if not tested, to the limits as specified in table 1.

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Device types	01 a	nd 02
Case outlines	K and L	3
Terminal number	Terminal	symbol
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	0E1 0123456789D079876543210C:	NC P 0 1 2 3 46 5 6 7 8 9 0 0 1 2 3 46 5 6 7 8 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

NC = No connection

FIGURE 1. <u>Terminal connections</u>.

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	Inputs		Output	Function
ŌĒ ₁	Œ2	Dn	Yn	
L	L	L	L	Transparent
L	L	н	Н	Transparent
H	х	x	2	Three-state
х	н	х	Z	Three-state

H = High voltage level L = Low voltage level X = Irrelevant

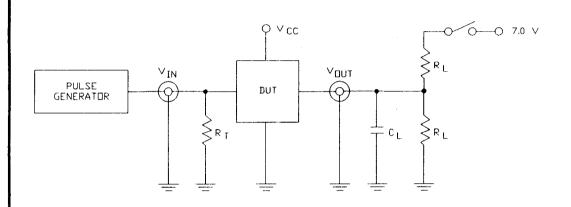
Z = High impedance state

FIGURE 2. <u>Truth table</u>.

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Switch position

Test	Switch
t _{PLZ}	Closed
tpZL	Closed
All others	Open

NOTES:

- 1. $\mathbf{C}_{\mathbf{L}}$ includes jig and probe capacitance.
- 2. R_L^- = 500 Ω ; C_L^- = 50 pF; R_T^- = Z_{OUT}^- of pulse generators.
- 3. Pulse generator for all pulses: PRR \leq 1.0 MHz, $\rm Z_{OUT}^{} \leq 50\Omega$, $\rm t_r^{} = \rm t_f^{} \leq 2.5$ ns.

FIGURE 3. Test circuit and switching waveforms.

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PROPAGATION DELAY WAVEFORMS

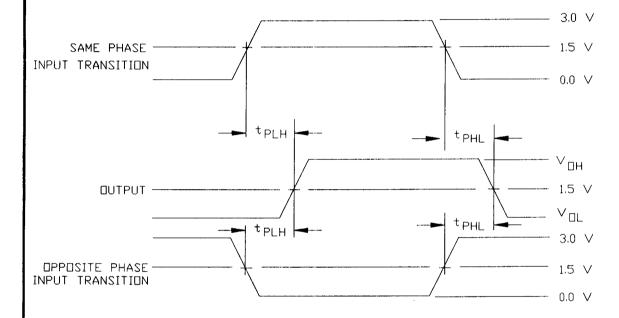


FIGURE 3. Test circuit and switching waveforms - Continued.

STANDARDIZED
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DAYTON, OHIO 45444

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ENABLE AND DISABLE TIMES

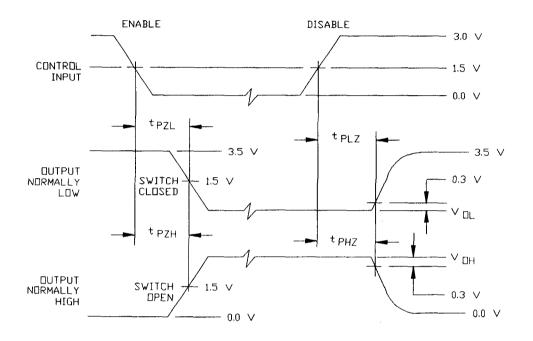


FIGURE 3. Test circuit and switching waveforms - Continued.

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- 3.4 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in 6.4 herein
- 3.5 <u>Certificate of compliance</u>. 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 <u>Certificate of conformance</u>. 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 <u>Notification of change</u>. 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 <u>Sampling and inspection</u>. 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_{IN} and C_{OUT} measurements) shall be measured only for the initial test and after process or design changes which may affect capacitance. Test all applicable pins on five devices with zero failures.
 - d. Subgroups 7 and 8 tests shall verify the truth table as specified on figure 2.

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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, 10,11
Group A test requirements (method 5005)	1,2,3,4,7,8, 9,10,11
Groups C and D end-point electrical parameters (method 5005)	1,2,3

^{*}PDA applies to subgroup 1.

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

5. PACKAGING

5.1 <u>Packaging requirements</u>. 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.

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- 6.2 <u>Replaceability</u>. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.
- 6.3 <u>Comments</u>. Comments on this drawing should be directed to DESC-ECS, Dayton; Ohio 45444, or telephone 513-296-5375.
- 6.4 <u>Approved source of supply</u>. 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	Vendor CAGE number	Vendor similar part
part number		number 1/
5962-8950601KX	61772	54FCT827AEB
5962-8950601LX	61772	54FCT827ADB
5962-89506013X	61772	54FCT827ALB
5962-8950602KX	61772	54FCT827BEB
5962-8950602LX	61772	54FCT827BDB
5962-89506023x	61772	54FCT827BLB

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

> Vendor CAGE number

Vendor name and address

61772

Integrated Device Technology 3236 Scott Boulevard Santa Clara, CA 95052

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NLU3G16AMX1TCG NLV27WZ125USG MC74HCT365ADTR2G BCM6306KMLG 54FCT240CTDB Le87401NQC Le87402MQC
028192B 042140C 051117G 070519XB 065312DB 091056E 098456D NL17SG07DFT2G NL17SG17DFT2G NL17SG34DFT2G
NL17SZ07P5T5G NL17SZ125P5T5G NLU1GT126AMUTCG NLV27WZ16DFT2G 5962-8982101PA 5962-9052201PA 74LVC07ADR2G
MC74VHC1G125DFT1G NL17SH17P5T5G NL17SZ125CMUTCG NLV17SZ07DFT2G NLV37WZ17USG NLVHCT244ADTR2G
NC7WZ17FHX 74HCT126T14-13 NL17SH125P5T5G NLV14049UBDTR2G NLV37WZ07USG 74VHC541FT(BE) RHFAC244K1
74LVC1G17FW4-7 74LVC1G126FZ4-7 BCM6302KMLG 74LVC1G07FZ4-7 74LVC1G125FW4-7