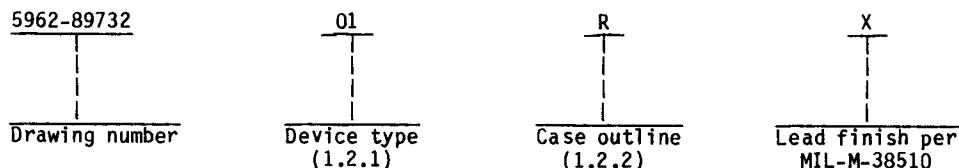


1. SCOPE

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:



1.2.1 Device types. The device types shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	54FCT241	Octal buffer/line driver with three-state output, TTL compatible
02	54FCT241A	Octal buffer/line driver with three-state output, TTL compatible

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, 1.060" x .310" x .200"), dual-in-line package
S	F-5 (20-lead, .540" x .300" x .100"), flat package
2	C-2 (20-terminal, .358" x .358" x .100"), square chip carrier package

1.3 Absolute maximum ratings. 1/

Supply voltage range	-0.5 V dc to +7.0 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 output current	*100 mA
DC input diode current (I_{IK})	-20 mA
DC output diode current (I_{OK})	-50 mA
Maximum power dissipation (P_D) 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

1.4 Recommended operating conditions.

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

1/ All voltages referenced to GND.

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

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2. APPLICABLE DOCUMENTS

2.1 Government specification, standard, and bulletin. Unless otherwise specified, the following specification, standard, and bulletin 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.

BULLETIN

MILITARY

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

(Copies of the specification, standard, and bulletin 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 herein, the electrical performance characteristics are as specified in table I and apply over the full case 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. 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 MIL-BUL-103 (see 6.6 herein).

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C < T _C < +125°C V _{CC} = 5.0 V dc ±10% unless otherwise specified	Device type	Group A subgroups	Limits		Unit
					Min	Max	
High level output voltage	V _{OH}	V _{CC} = 4.5 V, V _{IL} = 0.8 V, V _{IH} = 2.0 V	I _{OH} = -300 μA	A11	1, 2, 3	4.3	V
			I _{OH} = -12 mA	A11	1, 2, 3	2.4	V
Low level output voltage	V _{OL}	V _{CC} = 4.5 V, V _{IL} = 0.8 V, V _{IH} = 2.0 V	I _{OL} = 300 μA	A11	1, 2, 3	0.2	V
			I _{OL} = 48 mA	A11	1, 2, 3	0.5	V
Input clamp voltage	V _{IK}	V _{CC} = 4.5 V, I _{IN} = -18 mA	A11	1, 2, 3		-1.2	V
High level input current	I _{IH}	V _{CC} = 5.5 V, V _{IN} = 5.5 V	A11	1, 2, 3		5.0	μA
Low level input current	I _{IL}	V _{CC} = 5.5 V, V _{IN} = GND	A11	1, 2, 3		-5.0	μA
High impedance output current	I _{OZH}	V _{CC} = 5.5 V, V _{IN} = 5.5 V	A11	1, 2, 3		10	μA
	I _{OZL}	V _{CC} = 5.5 V, V _{IN} = GND	A11	1, 2, 3		-10	μA
Short circuit output current	I _{OS}	V _{CC} = 5.5 V 1/ V _O = GND	A11	1, 2, 3	-60		mA
Quiescent power supply current (CMOS inputs)	I _{CCQ}	V _{IN} ≤ 0.2 V or V _{IN} ≥ 5.3 V, V _{CC} = 5.5 V, f _I = 0 MHz	A11	1, 2, 3		1.5	mA
Quiescent power supply current (TTL inputs)	ΔI _{CC}	V _{CC} = 5.5 V, V _{IN} = 3.4 V 2/	A11	1, 2, 3		2.0	mA
Dynamic power supply current	I _{CCD}	V _{CC} = 5.5 V, \overline{OE}_N = GND, one bit toggling, 50% duty cycle, V _{IN} ≥ 5.3 V or V _{IN} ≤ 0.2 V, outputs open	A11	3/		0.25	mA/ MHz

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions -55°C < T _C < +125°C V _{CC} = 5.0 V dc ±10% unless otherwise specified	Device type	Group A subgroups	Limits		Unit
					Min	Max	
Total power supply current	I _{CC}	V _{CC} = 5.5 V, outputs open, f _I = 10 MHz, 50% duty cycle, one bit toggling, OEA = OEB = GND 4/	V _{IN} ≥ 5.3 V or V _{IN} ≤ 0.2 V	A11	1, 2, 3	4.0	mA
			V _{IN} = 3.4 V or V _{IN} = GND	A11	1, 2, 3	5.0	mA
Input capacitance	C _{IN}	See 4.3.1c	A11	4		10	pF
Output capacitance	C _{OUT}	See 4.3.1c	A11	4		12	pF
Functional tests		See 4.3.1d	A11	7, 8			
Propagation delay time, Dn to On	t _{PLH} , t _{PHL}	C _L = 50 pF, R _L = 500Ω, 5/ see figure 4	01	9, 10, 11	1.5	7.0	ns
			02		1.5	5.1	
Output enable time, OEA, OEB to On	t _{PZH} , t _{PZL}	C _L = 50 pF, R _L = 500Ω, see figure 4 5/	01	9, 10, 11	1.5	8.5	ns
			02		1.5	6.5	
Output disable time, OEA, OEB to On	t _{PHZ} , t _{PLZ}		01	9, 10, 11	1.5	7.5	ns
			02		1.5	5.9	

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

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.

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_H

f_I = Input frequency in MHz

N_I = Number of inputs at f_I

5/ The minimum limits are guaranteed, if not tested, to the limits specified in table I.

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Device types 01 and 02	
Case outlines	R, S, 2
Terminal number	Terminal symbol
1	0EA
2	DA0
3	OB0
4	DA1
5	OB1
6	DA2
7	OB2
8	DA3
9	OB3
10	GND
11	DB3
12	OA3
13	DB2
14	OA2
15	DB1
16	OA1
17	DB0
18	OA0
19	OEB
20	VCC

FIGURE 1. Terminal connections.

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Inputs			Output
$\overline{OE}A$	$OE\overline{B}$	D_n	O_n
L	H	L	L
L	H	H	H
H	L	X	Z

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

FIGURE 2. Truth table.

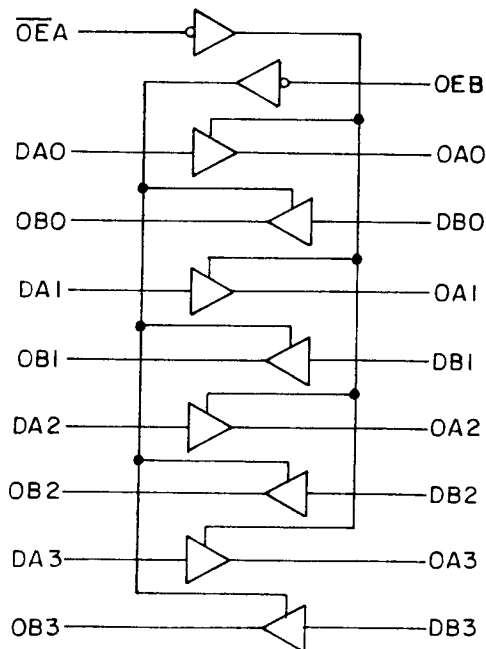
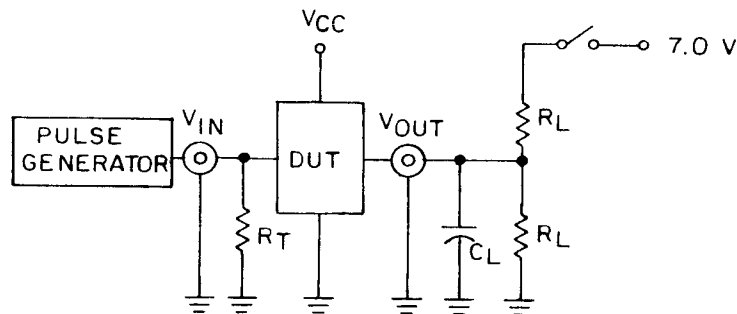


FIGURE 3. Logic diagram.

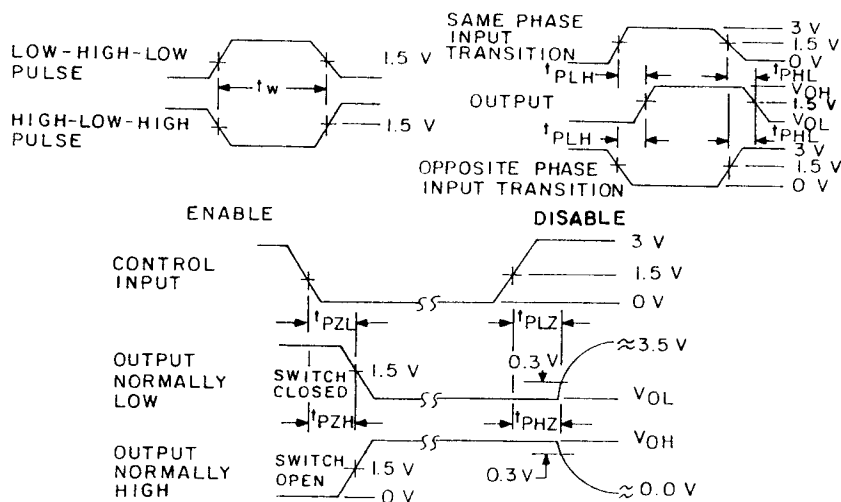
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R_L = Load resistor, see ac characteristics for value.
 C_L = Load capacitance, includes probe and jig capacitance.
 See ac characteristics for value.
 R_T = Termination should be equal to Z_{OUT} of pulse generators.



NOTES:

1. Diagram shown for input control enable, low and input control disable, high.
2. Pulse generator for all pulses: $t_f \leq 2.5$ ns, $t_r \leq 2.5$ ns.

FIGURE 4. Test circuit and switching waveforms.

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3.6 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 MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 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.

3.8 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.9 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, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).

(2) $T_A = +125^{\circ}\text{C}$, 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 initially and after process or design changes which may affect capacitance. Test all applicable pins on 5 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.
 - (1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).
 - (2) $T_A = +125^{\circ}\text{C}$, minimum.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 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.

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

6.4 Record of users. Military and industry users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of the drawing covering microelectronics devices (FSC 5962) should contact DESC-ECS, telephone (513) 296-6022.

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

6.6 Approved source of supply. An approved source of supply is listed in MIL-BUL-103. Additional sources will be added to MIL-BUL-103 as they become available. The vendor listed in MIL-BUL-103 has agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-ECS. The approved source of supply listed below is for information purposes only and is current only to the date of the last action of this document.

Military drawing part number	Vendor CAGE number	Vendor similar part number 1/
5962-8973201RX	61772 75569	IDT54FCT241DB P54PCT241DMB
5962-8973201SX	61772 75569	IDT54FCT241EB P54PCT241FMB
5962-89732012X	61772 75569	IDT54FCT241LB P54PCT241LMB
5962-8973202RX	61772 75569	IDT54FCT241ADB P54PCT241ADMB
5962-8973202SX	61772 75569	IDT54FCT241AEB P54PCT241AFMB
5962-89732022X	61772 75569	IDT54FCT241ALB P54PCT241ALMB

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

61772

75569

Vendor name
and address

Integrated Device Technology
3236 Scott Boulevard
Santa Clara, CA 95052

Performance Semiconductor Corporation
610 East Weddell Drive
Sunnyvale, CA 94089

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