REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
B	Add vendor, FSCM 04713. Delete min. limits from I_{IL} and propagation delays. Change I_{IL} max limits. Editorial changes throughout.	86-01-15	N. A. Hauck
C	Added approved source of supply. Updated boilerplate.	95-03-24	M. L. Poelking

CURRENT CAGE CODE: 67268

REV																				
SHEET																				
REV																				
SHEET																				

REV STATUS OF SHEETS	REV	C	C	C	C	C	C	C	C	C						
	SHEET	1	2	3	4	5	6	7	8	9						

PMIC N/A	PREPARED BY T.E. Gordon	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444		
STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY R. F. Gonzales	MICROCIRCUIT, DIGITAL, LOW POWER SCHOTTKY TTL, DECODER, MONOLITHIC SILICON		
	APPROVED BY N. A. Hauck			
	DRAWING APPROVAL DATE 76-12-22			
		SIZE **A**	CAGE CODE **14933**	**76045**
	REVISION LEVEL C	SHEET 1	OF	9

DESC FORM 193
JUL 94

5962-E129-95

9004708 0005805 9T7

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 <u>Part or Identifying Number (PIN)</u>. The complete PIN shall be as shown in the following example:

76045	01	E	X
Drawing number	Device type (see 1.2.1)	Case outline (see 1.2.2)	Lead finish (see 1.2.3)

1.2.1 <u>Device type(s)</u>. The device type(s) shall identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	54LS47	single 4 to 7 line decoder with open collector outputs

1.2.2 <u>Case outline(s)</u>. The case outline(s) shall be as designated in MIL-STD-1835 and as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
E	GDIP1-T16 or CDIP2-T16	16	dual-in-line package
F	GDFP2-F16 or CDFP3-F16	16	flat package

1.2.3 <u>Lead finish</u>. The lead finish shall be as specified in MIL-STD-883 (see 3.1 herein). 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 <u>Absolute maximum ratings</u>.

Supply voltage range -	-0.5 V dc to 7.0 V dc
Input voltage range -	-1.5 V dc at -18 mA to 5.5 V dc
Storage temperature range - - - - - - - - - - - - - - - -	-65°C to +150°C
Maximum power dissipation (P_D) 1/- - - - - - - - - - - - -	71.5 mW
Lead temperature (soldering, 10 seconds) - - - - - - - -	+300°C
Thermal resistance, junction-to-case (θ_{JC}) - - - - - - -	(See MIL-STD-1835)
Junction temperature (T_J) - - - - - - - - - - - - - - - - -	+175°C

1.4 <u>Recommended operating conditions</u>.

Supply voltage range (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
Case operating temperature range (T_C)- - - - - - - - - -	-55°C to +125°C

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

STANDARD **MICROCIRCUIT DRAWING** **DEFENSE ELECTRONICS SUPPLY CENTER** **DAYTON, OHIO 45444**	**SIZE** **A**		**76045**
		REVISION LEVEL C	**SHEET** 2

DESC FORM 193A
JUL 94

2. APPLICABLE DOCUMENTS

2.1 <u>Government specification, standards, and bulletin</u>. Unless otherwise specified, the following specification, standards, 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-I-38535   - Integrated Circuits (Microcircuits) Manufacturing, General Specification for.

STANDARDS

  MILITARY

    MIL-STD-883   - Test Methods and Procedures for Microelectronics.
    MIL-STD-1835   - Microcircuit Case Outlines.

BULLETIN

  MILITARY

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

(Copies of the specification, standards, 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 <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. Product built to this drawing that is produced by a Qualified Manufacturer Listing (QML) certified and qualified manufacturer or a manufacturer who has been granted transitional certification to MIL-I-38535 may be processed as QML product in accordance with the manufacturers approved program plan and qualifying activity approval in accordance with MIL-I-38535. This QML flow as documented in the Quality Management (QM) plan may make modifications to the requirements herein. These modifications shall not affect form, fit, or function of the device. These modifications shall not affect the PIN as described herein. A "Q" or "QML" certification mark in accordance with MIL-I-38535 is required to identify when the QML flow option is used.

3.2 <u>Design, construction, and physical dimensions</u>. The design, construction, and physical dimensions shall be as specified in MIL-STD-883 (see 3.1 herein) and herein.

3.2.1 <u>Case outline(s)</u>. The case outline(s) shall be in accordance with 1.2.2 herein.

3.2.2 <u>Terminal connections</u>. The terminal connections shall be as specified on figure 1.

3.2.3 <u>Truth table</u>. The truth table shall be as specified on figure 2.

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

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

STANDARD MICROCIRCUIT DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE **A**		76045
		REVISION LEVEL C	SHEET 3

DESC FORM 193A
  JUL 94

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T_C ≤ +125°C unless otherwise specified 4.5 V ≤ V_{CC} ≤ 5.5 V	Group A subgroups	Device type	Limits		Unit
					Min	Max	
High level output voltage	V_{OH}	V_{CC} = 4.5 V I_{OH} = -50 μA V_{IN} = 0.7 V or 2.0 V	1, 2, 3	01	2.4		V
Low level output voltage	V_{OL}	V_{CC} = 4.5 V I_{OL} = 1.6 mA V_{IN} = 0.7 V or 2.0 V	1, 2, 3	01		0.4	V
Input voltage clamp	V_{IC}	V_{CC} = 4.5 V I_{IN} = -18 mA T_C = +25°C	1	01		-1.5	V
Maximum collector cutoff current	I_{CEX}	V_{CC} = 4.5 V V_{OH} = 15 V	1, 2, 3	01		250	μA
High level input current	I_{IH1}	V_{CC} = 5.5 V V_{IH} = 2.7V	1, 2, 3	01		20	μA
	I_{IH2}	V_{CC} = 5.5 V V_{IH} = 5.5 V	1, 2, 3	01		100	
Low level input current at any input except BI/RBO	I_{IL1}	V_{CC} = 5.5 V V_{IL} = 0.4 V	1, 2, 3	01		-0.4	mA
Low level input current at BI/RBO	I_{IL2}	V_{CC} = 5.5 V V_{IL} = 0.4 V	1, 2, 3	01		-1.2	mA
Short circuit output current	I_{OS}	V_{CC} = 5.5 V 1/	1, 2, 3	01	-0.3	-2.0	mA
Supply current	I_{CC}	V_{CC} = 5.5 V	1, 2, 3	01		13	mA
Functional tests		See 4.3.1c	7				

See footnotes at end of table.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55°C \le T_C \le +125°C$ unless otherwise specified $4.5\ V \le V_{CC} \le 5.5\ V$		Group A subgroups	Device type	Limits		Unit
						Min	Max	
Propagation delay time high to low level 2/ from any input to output	t_{PHL1}	$V_{CC} = 5.0\ V$ $R_L = 655\Omega$ 3/	$C_L = 15\ pF \pm 10\%$	9	01		100	ns
				10, 11	01		140	
			$C_L = 50\ pF \pm 10\%$	9	01		105	
				10, 11	01		158	
Propagation delay time low to high level 2/ from any input to output	t_{PLH1}	$V_{CC} = 5.0\ V$ $R_L = 655\Omega$ 3/	$C_L = 15\ pF \pm 10\%$	9	01		100	ns
				10, 11	01		140	
			$C_L = 50\ pF \pm 10\%$	9	01		105	
				10, 11	01		158	

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.

2/ Propagation delay time testing may be performed using either $C_L = 15\ pF$ or $C_L = 50\ pF$. However, the manufacturer must certify and guarantee that the microcircuits meet the switching test limits specified for a 50 pF load.

3/ $R_L = 655\Omega \pm 10\%$.

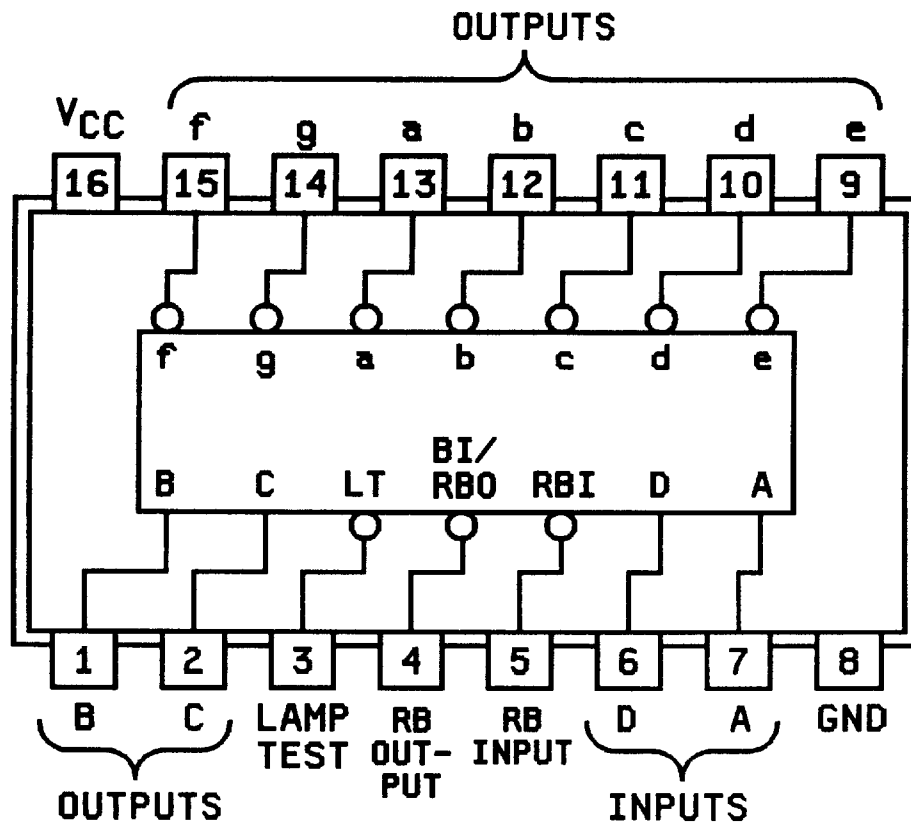|			
STANDARD MICROCIRCUIT DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	**SIZE** **A**		76045
		REVISION LEVEL C	SHEET 5

DESC FORM 193A
JUL 94

9004708 0005809 542

OUTPUTS

FIGURE 1. Terminal connections (top view).

STANDARD MICROCIRCUIT DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		76045
		REVISION LEVEL C	SHEET 6

9004708 0005810 264

DECIMAL OR FUNCTION	INPUTS							OUTPUTS							
	LT	RBI	D	C	B	A	BI/RBO	a	b	c	d	e	f	g	NOTE
0	H	H	L	L	L	L	H	L	L	L	L	L	L	H	1
1	H	X	L	L	L	H	H	H	L	L	H	H	H	H	1
2	H	X	L	L	H	L	H	L	L	H	L	L	H	L	1
3	H	X	L	L	H	H	H	L	L	L	L	H	H	L	1
4	H	X	L	H	L	L	H	H	L	L	H	H	L	L	1
5	H	X	L	H	L	H	H	L	H	L	L	H	L	L	1
6	H	X	L	H	H	L	H	H	H	L	L	L	L	L	1
7	H	X	L	H	H	H	H	L	L	L	H	H	H	H	1
8	H	X	H	L	L	L	H	L	L	L	L	L	L	L	1
9	H	X	H	L	L	H	H	L	L	L	H	H	L	L	1
10	H	X	H	L	H	L	H	H	H	H	L	H	L	L	1
11	H	X	H	L	H	H	H	H	H	L	L	H	H	L	1
12	H	X	H	H	L	L	H	H	L	H	H	H	L	L	1
13	H	X	H	H	L	H	H	L	H	H	L	H	L	L	1
14	H	X	H	H	H	L	H	H	H	H	L	H	L	L	1
15	H	X	H	H	H	H	H	H	H	H	H	H	H	H	1
BI	X	X	X	X	X	X	L	H	H	H	H	H	H	H	2
RBI	H	L	L	L	L	L	L	H	H	H	H	H	H	H	3
LT	L	X	X	X	X	X	H	L	L	L	L	L	L	L	4

NOTES:

1. BI/RBO is wire-OR logic serving as blanking input (BI) and/or ripple-blanking output (RBO). The blanking input must be open or held at a high logic level when output functions 0 through 15 are desired and ripple-blanking input (RBI) must be held open or at high logic level during the decimal 0 input. X = input may be high or low.
2. When a low logic level is applied to the blanking input (forced condition) all segment outputs go to a high logic level regardless of the state of any other input condition.
3. When ripple-blanking input (RBI) is at a low logic level, lamp test input is at high logic level and A = B = C = D = low logic level, all segment outputs go to a high logic level and the ripple-blanking output goes to a low logic level (response condition).
4. When blanking input/ripple-blanking output is open or held at a high logic level, and a low logic level is applied to lamp-test input, all segment outputs go to a low logic level.

FIGURE 2. Truth table.

STANDARD MICROCIRCUIT DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		76045
		REVISION LEVEL C	SHEET 7

DESC FORM 193A
JUL 94

3.5 <u>Marking</u>. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

3.6 <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 MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-EC 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 <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.

3.8 <u>Notification of change</u>. Notification of change to DESC-EC shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.9 <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 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. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. 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 = +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.

TABLE II. <u>Electrical test requirements</u>.

MIL-STD-883 test requirements	Subgroups (in accordance with method 5005, table I)
Interim electrical parameters (method 5004)	-------
Final electrical test parameters (method 5004)	1*, 2, 3, 9
Group A test requirements (method 5005)	1, 2, 3, 7, 9
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3, 10, 11**

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

STANDARD MICROCIRCUIT DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		76045
		REVISION LEVEL C	SHEET 8

DESC FORM 193A
JUL 94

4.3 <u>Quality conformance inspection</u>. 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 <u>Group A inspection</u>.

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

b. Subgroups 4, 5, 6, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

C. Subgroups 7 shall include verification of the truth table.

4.3.2 <u>Groups C and D inspections</u>.

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. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. 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 = +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-STD-883 (see 3.1 herein).

6. NOTES

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

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>Configuration control of SMD's</u>. 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 <u>Record of users</u>. Military and industrial 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 drawings covering microelectronics devices (FSC 5962) should contact DESC-EC, telephone (513) 296-6047.

6.5 <u>Comments</u>. Comments on this drawing should be directed to DESC-EC, Dayton, Ohio 45444-5270, or telephone (513) 296-8525.

6.6 <u>Approved sources of supply</u>. Approved sources of supply 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-EC.

STANDARD MICROCIRCUIT DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		76045
		REVISION LEVEL C	SHEET 9

DESC FORM 193A
JUL 94

■ 9004708 0005813 T73 ■