

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
F	Add device type 02. Changes to Absolute maximum ratings and Table I. Editorial changes throughout. Delete vendor CAGE 34333.	93-02-18	M. A. Frye

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PMIC N/A	PREPARED BY Sandra B. Rooney				DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444																													
STANDARDIZED MILITARY DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY Sandra B. Rooney																																	
	APPROVED BY M. A. Frye				MICROCIRCUIT, DIGITAL, TTL, DUAL PERIPHERAL DRIVERS, MONOLITHIC SILICON																													
	DRAWING APPROVAL DATE 77-10-12																																	
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SIZE A		CAGE CODE 67268		77049																														
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DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

5962-E088-93

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 or Identifying Number (PIN). The complete PIN shall be as shown in the following example:

77049	01	P	X
Drawing number	Device type (see 1.2.1)	Case outline (see 1.2.2)	Lead finish (see 1.2.3)

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

Device type	Generic number	Circuit function
01	55452	Dual peripheral NAND driver
02	55451	Dual peripheral AND driver

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

Outline letter	Descriptive designator	Terminals	Package style
P	GDIP1-T8 or CDIP2-T8	8	Dual-in-line
2	CQCC1-N20	20	Square leadless chip carrier

1.2.3 Lead finish. The lead finish shall be as specified in MIL-M-38510. 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.

Supply voltage, V_{CC}	-----	+7.0 V dc
Input voltage	-----	+5.5 V dc
Storage temperature range	-----	-65°C to +150°C
Maximum power dissipation, P_D	1/	
Case 2	-----	1375 mW
Case P	-----	1050 mW
Lead temperature (soldering, 10 seconds):		
Case P	-----	+300°C
Case temperature (soldering, 60 seconds):		
Case 2	-----	+260°C
Thermal resistance, junction to case (θ_{JC})	---	See MIL-STD-1835
Junction temperature (T_J)	-----	+150°C
Thermal resistance (θ_{JA}):		
Case 2	-----	150°C/W
Case P	-----	125°C/W

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
Ambient operating temperature range (T_A)	-----	-55°C to +125°C

1/ For Case 2, derate at 11.0 mW/°C above $T_A = +25^\circ\text{C}$. For Case P, derate at 8.4 mW/°C above $T_A = +25^\circ\text{C}$.

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2. APPLICABLE DOCUMENTS

2.1 Government specification, standards and bulletin. 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-M-38510 - Microcircuits, 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 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 Case outlines. The case outlines shall be in accordance with 1.2.2 herein.

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

3.2.3 Truth tables. The truth tables shall be as specified on figure 2.

3.3 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full recommended ambient 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 PIN may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

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-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.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T _A ≤ +125°C unless otherwise specified		Device Type	Group A subgroups	Limits		Unit
						Min	Max	
Input clamp voltage	V _{IC}	V _{CC} = 4.5 V; I _{IN} = -12 mA		ALL	1		-1.5	V
High level output current	I _{OH}	V _{CC} = 4.5 V; V _{IL} = 0.8 V; V _{IH} = 2.0 V V _{OH} = 30 V		ALL	1, 2, 3		300	μA
Low level output voltage	V _{OL}	V _{CC} = 4.5 V V _{IH} = 2 V V _{IL} = 0.8 V	I _{OL} = 100 mA	ALL	1, 2, 3		0.5	V
			I _{OL} = 300 mA				0.8	
Input current at maximum input voltage	I _{IN}	V _{CC} = 5.5 V; V _{IN} = 5.5 V		ALL	1, 2, 3		1.0	mA
High level input current	I _{IH}	V _{CC} = 5.5 V; V _{IN} = 2.4 V		ALL	1, 2, 3		40	μA
Low level input current	I _{IL}	V _{CC} = 5.5 V; V _{IN} = 0.4 V		ALL	1, 2, 3		-1.6	mA
Supply current, outputs high	I _{CCH}	V _{CC} = 5.5 V	V _{IN} = 0 V	01	1, 2, 3		14	mA
			V _{IN} = 5 V	02			11	
Supply current, outputs low	I _{CCL}	V _{CC} = 5.5 V	V _{IN} = 5 V	01	1, 2, 3		71	mA
			V _{IN} = 0 V	02			65	
Propagation delay time	t _{PLH} , t _{PHL}	V _{CC} = 5 V; I _O = 200 mA C _L = 15 pF R _L = 50Ω		01	9		35	ns
Propagation delay time	t _{PLH} , t _{PHL}	V _{CC} = 5 V; I _O = 200 mA C _L = 15 pF R _L = 50Ω		02	9		25	ns

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ unless otherwise specified	Device Type	Group A subgroups	Limits		Unit
					Min	Max	
Transition time, low-to-high level output	t_{TLH}	$V_{\text{CC}} = 5 \text{ V}; I_{\text{O}} = 200 \text{ mA}$ $C_{\text{L}} = 15 \text{ pF}$ $R_{\text{L}} = 50\Omega$	ALL	9		8	ns
Transition time, high-to-low level output	t_{THL}	$C_{\text{L}} = 15 \text{ pF}$ $R_{\text{L}} = 50\Omega$	ALL	9		12	
Functional tests		See 4.3.1c	ALL	7			

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Device types	01 and 02	
Case outlines	P	2
Terminal number	Terminal symbol	
1	1A	NC
2	1B	1A
3	1Y	NC
4	GND	NC
5	2Y	1B
6	2A	NC
7	2B	1Y
8	V _{CC}	NC
9	---	NC
10	---	GND
11	---	NC
12	---	2Y
13	---	NC
14	---	NC
15	---	2A
16	---	NC
17	---	2B
18	---	NC
19	---	NC
20	---	V _{CC}

FIGURE 1. Terminal connections

Device type 01

A	B	Y
L	L	H (OFF State)
L	H	H (OFF State)
H	L	H (OFF State)
H	H	L (ON State)

Device type 02

A	B	Y
L	L	L (ON State)
L	H	L (ON State)
H	L	L (ON State)
H	H	H (OFF State)

FIGURE 2. Truth tables

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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-EC 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. 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) $T_A = +125^\circ\text{C}$, 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.

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

* PDA applies to subgroup 1 (see 4.2c).

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

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4.3.1 Group A inspection.

- 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. Subgroup 7 tests sufficient to 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, 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) $T_A = +125^{\circ}\text{C}$, 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 original equipment manufacturer 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. Replaceability is determined as follows:

- a. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.
- b. When a QPL source is established, the device specified in this drawing will be replaced by the microcircuit identified as PIN M38510/12903BPX.

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 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 Comments. Comments on this drawing should be directed to DESC-EC, Dayton, Ohio 45444, or telephone (513) 296-5377.

6.6 Approved sources of supply. 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.

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