

**REVISIONS**

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Pg. 4, TABLE I. Change I <sub>H2</sub> , I <sub>OS</sub> , and I <sub>O1</sub> & I <sub>O2</sub> . Pg. 7, TABLE II. Guarantee subgroups 10 & 11. Pg. 9, Add vendor FSCM 27014	84-07-03	N. A. HAUCK
B	Pg. 4, TABLE I. Change propagation delay times. Change V <sub>OL</sub> and I <sub>JL</sub> . Editorial changes throughout.	86-02-25	D. M. COOL
C	Convert to standard military drawing format. Change CAGE code to 67268. Make device 01EX and 02EX inactive for new design. Add case outline 2 for device 01 and 02. Change high level input current. Change vendor similar part number for CAGE 01295. Editorial changes throughout.	89-07-18	M. A. FRYE
D	Drawing updated to reflect current requirements. Editorial changes throughout. - drw	00-11-17	R. MONNIN
E	Make correction to the Marking paragraph 3.5. - ro	05-04-12	R. MONNIN

**CURRENT CAGE CODE 67268**

THE ORIGINAL FIRST SHEET OF THIS DRAWING HAS BEEN REPLACED.

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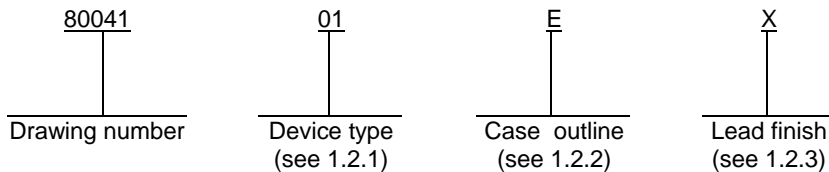
REV STATUS	REV	E	E	E	E	E	E	E	E	E	E								
OF SHEETS	SHEET	1	2	3	4	5	6	7	8	9									

PMIC N/A	PREPARED BY RONALD G. SINGLETON	<p align="center"><b>DEFENSE SUPPLY CENTER COLUMBUS</b>  <b>COLUMBUS, OHIO 43218-3990</b>  <a href="http://www.dscc.dla.mil">http://www.dscc.dla.mil</a></p> <p align="center">MICROCIRCUITS, LINEAR, LINE DRIVERS AND RECEIVERS, MONOLITHIC SILICON</p>																	
<p align="center"><b>STANDARD MICROCIRCUIT DRAWING</b></p> <p>THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p> <p align="center">AMSC N/A</p>	CHECKED BY WILLIAM E. SHOUP																		
	APPROVED BY NELSON A. HAUCK																		
	DRAWING APPROVAL DATE 81-05-06																		
REVISION LEVEL E	SIZE A	CAGE CODE <b>14933</b>	<b>80041</b>																
SHEET		1 OF 9																	

1. SCOPE

1.1 Scope. This drawing describes device requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A.

1.2 Part or Identifying Number (PIN). The complete PIN is as shown in the following example:



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

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	7831	Dual differential line driver and receivers with output diode clamping
02	7832	Dual differential line driver and receivers

1.2.2 Case outline(s). The case outline(s) are 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
F	GDIP2-F16 or CDIP3-F16	16	Flat pack
2	CQCC1-N20	20	Square leadless chip carrier

1.2.3 Lead finish. The lead finish is as specified in MIL-PRF-38535, appendix A.

1.3 Absolute maximum ratings.

Supply voltage range ( $V_{CC}$ ) .....	-0.5 V dc to +7.0 V dc
Input voltage range .....	-1.5 V dc at -12 mA to +5.5 V dc
Storage temperature range .....	-65°C to +150°C
Power dissipation ( $P_D$ ) <sup>1/</sup> .....	220 mW
Lead temperature, (soldering 10 seconds) .....	300°C
Junction temperature ( $T_J$ ) .....	+175°C
Thermal resistance, junction-to-case ( $\theta_{JC}$ ) .....	See MIL-STD-1835
Thermal resistance, junction-to-ambient ( $\theta_{JA}$ ):	
Case E .....	91°C/W
Case F .....	125°C/W
Case 2 .....	91°C/W

1.4 Recommended operating conditions.

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 ( $V_{IL}$ ) .....	0.8 V dc
Ambient operating temperature range ( $T_A$ ) .....	-55°C to +125°C

<sup>1/</sup> 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, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

MIL-PRF-38535 - Integrated Circuits, Manufacturing, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard Microcircuits.  
 MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-103 - List of Standard Microcircuit Drawings.  
 MIL-HDBK-780 - Standard Microcircuit Drawings.

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or <http://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

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 takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B 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-PRF-38535 may be processed as QML product in accordance with the manufacturers approved program plan and qualifying activity approval in accordance with MIL-PRF-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-PRF-38535 is required to identify when the QML flow option is used.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535, appendix A 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 table. The truth table shall be as specified on figure 2.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics 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 II. The electrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-PRF-38535, appendix A. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked.

3.5.1 Certification/compliance mark. A compliance indicator "C" shall be marked on all non-JAN devices built in compliance to MIL-PRF-38535, appendix A. The compliance indicator "C" shall be replaced with a "Q" or "QML" certification mark in accordance with MIL-PRF-38535 to identify when the QML flow option is used.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions -55°C ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified		Group A subgroups	Device type	Limits		Unit
						Min	Max	
High level output voltage	V <sub>OH</sub>	V <sub>CC</sub> = 4.5 V, V <sub>IL</sub> = 0.8 V, V <sub>IH</sub> = 2.0 V	I <sub>OH</sub> = -2 mA	1, 2, 3	All	2.4		V
			I <sub>OH</sub> = -40 mA			1.8		
Input clamp voltage	V <sub>IC</sub>	V <sub>CC</sub> = 4.5 V, I <sub>IC</sub> = -12 mA, T <sub>A</sub> = +25°C		1	All		-1.5	V
Low level output voltage	V <sub>OL</sub>	V <sub>CC</sub> = 4.5 V, V <sub>IL</sub> = 0.8 V, V <sub>IH</sub> = 2.0 V, I <sub>OL</sub> = 40 mA		1, 2, 3	All		0.5	V
Output clamp voltage	V <sub>IC</sub>	V <sub>CC</sub> = 4.5 V, I <sub>IC</sub> = -12 mA, T <sub>A</sub> = +25°C		1	01		-1.5	V
Low level input current	I <sub>IL</sub>	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0.4 V		1, 2, 3	All		-1.6	mA
High level input current	I <sub>IH1</sub>	V <sub>CC</sub> = 5.5 V, V <sub>IH</sub> = 2.4 V		1, 2, 3	All		40	μA
		V <sub>CC</sub> = 5.5 V, V <sub>IH</sub> = 5.5 V					1.0	mA
Output short circuit current	I <sub>OS</sub>	V <sub>CC</sub> = 5.5 V, T <sub>A</sub> = +125°C <u>1/</u>		2	All	-40	-150	mA
Supply current	I <sub>CC</sub>	V <sub>CC</sub> = 5.5 V		1, 2, 3	All		90	mA
Inhibited-state output leakage current	I <sub>O1</sub>	V <sub>CC</sub> = 5.5 V, V <sub>OUT</sub> = 0.4 V T <sub>A</sub> = +25°C		1	All		-40	μA
	I <sub>O2</sub>	V <sub>CC</sub> = 5.5 V, V <sub>OUT</sub> = 2.4 V T <sub>A</sub> = +25°C					+40	
Propagation delay time, (low to high)	t <sub>PLH</sub>	V <sub>CC</sub> = 5.0 V, <u>2/</u> , <u>3/</u> C <sub>L</sub> = 50 pF		9, 10, 11	All	2	42	ns
Propagation delay time, (high to low)	t <sub>PHL</sub>	V <sub>CC</sub> = 5.0 V, <u>2/</u> , <u>3/</u> C <sub>L</sub> = 50 pF		9, 10, 11	All	2	42	ns
Propagation delay time, (disable to high)	t <sub>PZH</sub>	V <sub>CC</sub> = 5.0 V, <u>2/</u> C <sub>L</sub> = 50 pF		9, 10, 11	All	2	38	ns

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - continued.

Test	Symbol	Conditions -55°C ≤ T <sub>A</sub> ≤ +125°C unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Propagation delay time, (high to disable)	t <sub>PHZ</sub>	V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 5 pF <u>2/</u> , <u>4/</u>	9, 10, 11	All	2	21	ns
Propagation delay time, (disable to low)	t <sub>PZL</sub>	V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 50 pF <u>2/</u>	9, 10, 11	All	2	47	ns
Propagation delay time, (low to disable)	t <sub>PLZ</sub>	V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 5 pF <u>2/</u> , <u>4/</u>	9, 10, 11	All	2	38	ns
Functional testing		See 4.3.1c	7	All			

- 1/ Not more than one output should be shorted at a time.
- 2/ For subgroups 10 and 11 these limits shall be guaranteed, if not tested.
- 3/ For differential and single ended mode control.
- 4/ Testing can be done at 15 pF.

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-HDBK-103 (see 6.6 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-PRF-38535, appendix A and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DSCC-VA shall be required for any change that affects this drawing.

3.9 Verification and review. DSCC, DSCC'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.

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Device types	01 and 02	
Case outlines	E and F	2
Terminal number	Terminal symbol	
1	OUTPUT ENABLE B	NC
2	OUTPUT ENABLE B	OUTPUT ENABLE B
3	OUTPUT B <sub>2</sub>	OUTPUT ENABLE B
4	INPUT B <sub>2</sub>	OUTPUT B <sub>2</sub>
5	OUTPUT B <sub>1</sub>	INPUT B <sub>2</sub>
6	INPUT B <sub>1</sub>	NC
7	DIFF MODE CONTROL	OUTPUT B <sub>1</sub>
8	GND	INPUT B <sub>1</sub>
9	DIFF MODE CONTROL	DIFF MODE CONTROL
10	INPUT A <sub>1</sub>	GND
11	OUTPUT A <sub>1</sub>	NC
12	INPUT A <sub>2</sub>	DIFF MODE CONTROL
13	OUTPUT A <sub>2</sub>	INPUT A <sub>1</sub>
14	OUTPUT ENABLE A	OUTPUT A <sub>1</sub>
15	OUTPUT ENABLE A	INPUT A <sub>2</sub>
16	V <sub>CC</sub>	NC
17	---	OUTPUT A <sub>2</sub>
18	---	OUTPUT ENABLE A
19	---	OUTPUT ENABLE A
20	---	V <sub>CC</sub>

FIGURE 1. Terminal connections.

<b>STANDARD MICROCIRCUIT DRAWING</b> DEFENSE SUPPLY CENTER COLUMBUS COLUMBUS, OHIO 43218-3990	SIZE <b>A</b>		<b>80041</b>
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Inputs				Outputs			
Enable		Differential / single ended mode control		1	2	1	2
L	L	L	L	L	L	L	L
L	L	L	L	H	H	H	H
L	L	X	H	H	H	L	H
L	L	X	H	L	L	H	L
L	L	H	X	H	H	L	H
L	L	H	X	L	L	H	L
H	X	X	X	X	X	Hi Z	Hi Z
X	H	X	X	X	X	Hi Z	Hi Z

Notes: X = don't care

FIGURE 2. Truth table.

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4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

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 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.

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 shall include verification of 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 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 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.

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TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (in accordance with MIL-STD-883, 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.

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

## 5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535, appendix A.

## 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.

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

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 using DD Form 1692, Engineering Change Proposal.

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus (DSCC) when a system application requires configuration control and the applicable SMD. DSCC 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 DSCC-VA, telephone (614) 692-0544.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43218-3990, or telephone (614) 692-0547.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DSCC-VA.

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 05-04-12

Approved sources of supply for SMD 80041 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 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 DSCC-VA. This information bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535. DSCC maintains an online database of all current sources of supply at <http://www.dscclia.mil/Programs/Smcr/>.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>	Similar military specification PIN <u>2/</u>
8004101EA	<u>3/</u>	DS7831J/883B	M38510/10406BEA
8004101FA	<u>3/</u>	DS7831W/883B	M38510/10406BFA
80041012A	<u>3/</u>	DS7831JB/FKB	
8004102EA	3V146	DS7832J/883B	M38510/10407BEA
	<u>3/</u>	DS7832JB	
8004102FA	3V146	DS7832W/883B	M38510/10407BFA
80041022A	3V146	DS7832E/883B	
	<u>3/</u>	DS7832JB/FKB	

- 1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the vendor to determine its availability.
- 2/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.
- 3/ Not available from an approved source of supply.

Vendor CAGE  
number

3V146

Vendor name  
and address

Rochester Electronics  
10 Malcolm Hoyt Drive  
Newburyport, MA 01950

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