

REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Add vendor CAGE 34333. Delete vendor CAGE 01295.	87-12-10	M. A. Frye
B	Delete vendor CAGE 34333. Add vendor CAGE 01295 for device 02 case outlines C and 2. Page 9, figure 3: Z <sub>OUT</sub> should read $\approx 50 \Omega$ ; t <sub>W</sub> should read 500 ns. Device 01 is no longer available from an approved source. Editorial changes throughout.	88-10-06	M. A. Frye
C	Add a flat package, F-2 and make editorial changes throughout.	90-03-19	M. A. Frye
D	Changes in accordance with N.O.R. 5962-R168-95.	95-08-03	M. A. Frye
E	Changes in accordance with N.O.R. 5962-R262-97.	97-05-08	R. Monnin
F	Drawing updated to reflect current requirements. - ro	02-06-25	R. Monnin
G	Redrawn. Update paragraphs to MIL-PRF-38535 requirements. - drw	14-07-31	Charles F. Saffle

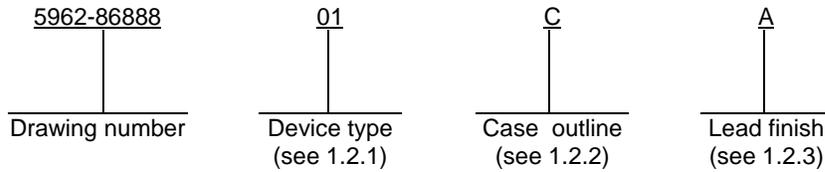
THE ORIGINAL FIRST SHEET OF THIS DRAWING HAS BEEN REPLACED.

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REV STATUS OF SHEETS	REV	G	G	G	G	G	G	G	G	G	G	G								
	SHEET	1	2	3	4	5	6	7	8	9	10									
PMIC N/A	PREPARED BY Donald Osborne	<b>DLA LAND AND MARITIME</b> <b>COLUMBUS, OHIO 43218-3990</b> <a href="http://www.landandmaritime.dla.mil">http://www.landandmaritime.dla.mil</a>  <b>MICROCIRCUIT, LINEAR, QUAD LINE RECEIVER,</b> <b>MONOLITHIC SILICON</b>																		
<b>STANDARD MICROCIRCUIT DRAWING</b>  THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE	CHECKED BY D. A. DiGenzo																			
	APPROVED BY N. A. Hauck																			
	DRAWING APPROVAL DATE 87-07-30																			
AMSC N/A	REVISION LEVEL G	SIZE A	CAGE CODE <b>67268</b>	<b>5962-86888</b>																
		SHEET		1 OF 10																

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 types. The device types identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	1489, 55189	Quad line receiver
02	1489A, 55189A	Quad line receiver

1.2.2 Case outlines. The case outlines are as designated in MIL-STD-1835 as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
	GDIP1-T14 or CDIP2-T14	14	Dual-in-line
D	GDFP1-F14 or CDFP2-F14	14	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 (V <sub>CC</sub> ) .....	+10 V dc
Input voltage .....	±30 V dc
Maximum power dissipation (P <sub>D</sub> ) .....	1 W <u>1/</u> , <u>2/</u>
Junction temperature (T <sub>J</sub> ) .....	+150°C
Storage temperature range .....	-65°C to +150°C
Lead temperature (soldering, 10 seconds) .....	+300°C
Thermal resistance, junction-to-case (θ <sub>JC</sub> ) .....	See MIL-STD-1835

1.4 Recommended operating conditions.

Supply voltage range (V <sub>CC</sub> ) .....	+4.5 V dc to +5.5 V dc
High level output current (I <sub>OH</sub> ) .....	-0.5 mA
Low level output current (I <sub>OL</sub> ) .....	+10 mA
Ambient operating temperature range (T <sub>A</sub> ) .....	-55°C to +125°C

1/ Must withstand the added P<sub>D</sub> due to short circuit test; e.g., I<sub>OS</sub>.

2/ Derate linearly above T<sub>A</sub> = +25°C at the rate of 6.7 mW/°C for cases C and 2 and 8.0 mW/°C for case D.

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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://quicksearch.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 Schematic diagram. The schematic diagram 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. For packages where marking of the entire SMD PIN number is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device.

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 <u>1/</u> , <u>2/</u> -55°C ≤ T <sub>A</sub> ≤ +125°C 4.95 V ≤ V <sub>CC</sub> ≤ 5.05 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Positive going threshold voltage	+V <sub>T</sub>		1, 2, 3	01	0.6	1.9	V
				02	1.30	2.65	
Negative going threshold voltage	-V <sub>T</sub>		1, 2, 3	All	0.35	1.60	V
Output low voltage	V <sub>OL</sub>	V <sub>C</sub> = maximum, V <sub>I</sub> = 3 V, I <sub>OL</sub> = 10 mA	1, 2, 3	All		0.45	V
Output high voltage	V <sub>OH</sub>	V <sub>C</sub> = minimum, I <sub>OH</sub> = -0.5 mA, V <sub>I</sub> = 0.75 V	1, 2, 3	All	2.6		V
		V <sub>C</sub> = minimum, I <sub>OH</sub> = -0.5 mA, Input open			2.6		
Input low current	I <sub>IL</sub>	V <sub>I</sub> = -25 V	1, 2, 3	All	-3.6	-8.3	mA
		V <sub>I</sub> = -3 V			-0.43		
Input high current	I <sub>IH</sub>	V <sub>I</sub> = 25 V	1, 2, 3	All	3.6	8.3	mA
		V <sub>I</sub> = 3 V <u>3/</u>	1, 3		0.43		
			2		0.37		
Output short circuit current	I <sub>OS</sub>	V <sub>I</sub> = 0 V, V <sub>CC</sub> = maximum	1, 2, 3	All		-4.0	mA
Supply current	I <sub>CC</sub>	V <sub>I</sub> = 5 V, outputs open, V <sub>CC</sub> = maximum, T <sub>A</sub> = +25°C	1	All		26	mA
Propagation delay input to output	t <sub>PLH</sub>	See figures 3 and 4, R <sub>L</sub> = 3.9 kΩ, C <sub>L</sub> = 15 pF	9	All		85	ns
			10, 11			127	
	t <sub>PHL</sub>	See figures 3 and 4, R <sub>L</sub> = 390Ω, C <sub>L</sub> = 15 pF	9			50	
			10, 11			75	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics – continued.

Test	Symbol	Conditions <u>1/</u> , <u>2/</u> -55°C ≤ T <sub>A</sub> ≤ +125°C 4.95 V ≤ V <sub>CC</sub> ≤ 5.05 V unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Transition time	t <sub>TLH</sub>	See figures 3 and 4, R <sub>L</sub> = 3.9 kΩ, C <sub>L</sub> = 15 pF	9	All		175	ns
			10, 11			262	
	t <sub>THL</sub>	See figures 3 and 4, R <sub>L</sub> = 390Ω, C <sub>L</sub> = 15 pF	9			20	
			10, 11			30	

- 1/ All voltage values are with respect to network ground terminal.
- 2/ All characteristics measured with response control terminal open.
- 3/ May not meet EIA-RS232C standard at +125°C.

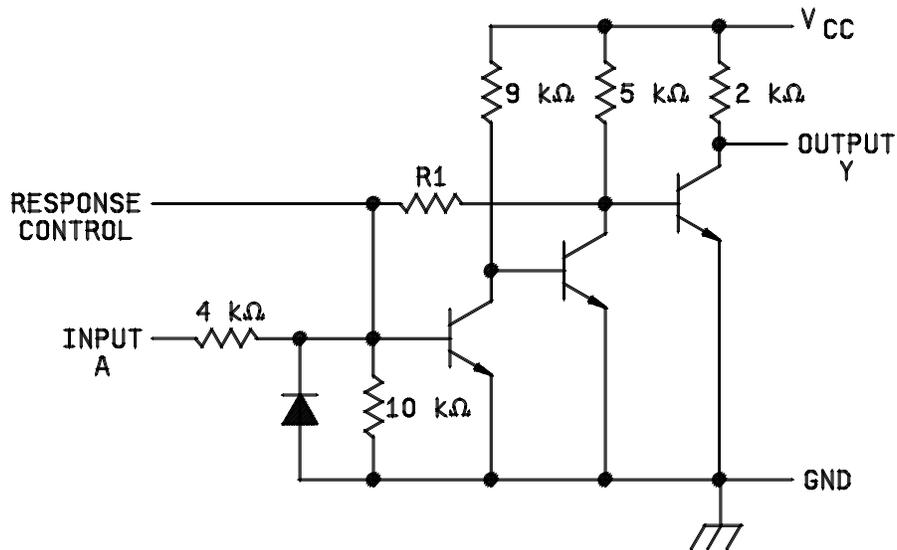
<b>STANDARD MICROCIRCUIT DRAWING</b> DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990	SIZE <b>A</b>		<b>5962-86888</b>
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Device types	01 and 02	
Case outlines	C and D	2
Terminal number	Terminal symbol	
1	1A	NC
2	1 CONTROL	1A
3	1Y	1 CONTROL
4	2A	1Y
5	2 CONTROL	NC
6	2Y	2A
7	GND	NC
8	3Y	2 CONTROL
9	3 CONTROL	2Y
10	3A	GND
11	4Y	NC
12	4 CONTROL	3Y
13	4A	3 CONTROL
14	V <sub>CC</sub>	3A
15	---	NC
16	---	4Y
17	---	NC
18	---	4 CONTROL
19	---	4A
20	---	V <sub>CC</sub>

NC = No connection

FIGURE 1. Terminal connections.

<b>STANDARD MICROCIRCUIT DRAWING</b> DLA LAND AND MARITIME COLUMBUS, OHIO 43218-3990	SIZE <b>A</b>		<b>5962-86888</b>
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Resistor	Device types	
	01	02
R1	10 kΩ	2 kΩ

Resistor values shown are nominal.

FIGURE 2. Schematic diagram.

**STANDARD  
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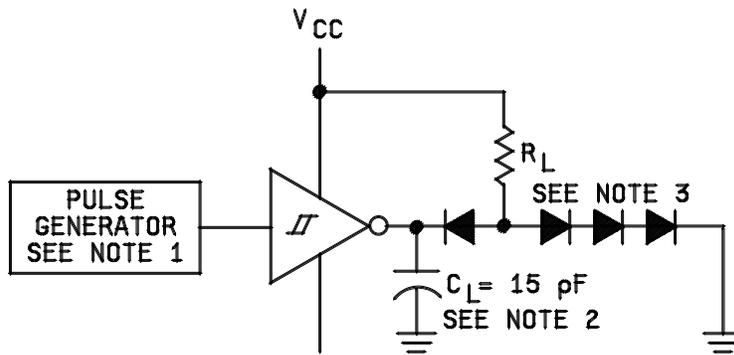
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NOTES:

1. The pulse generator has the following characteristics:  $Z_{OUT} \approx 50 \Omega$ ,  $t_W = 500 \text{ ns}$ .
2.  $C_L$  includes probe and jig capacitance.
3. All diodes are 1N3064 or equivalent.
4. AC switching characteristics are measured using single pulse techniques ( PRR = 0 ).

FIGURE 3. Test load circuit.

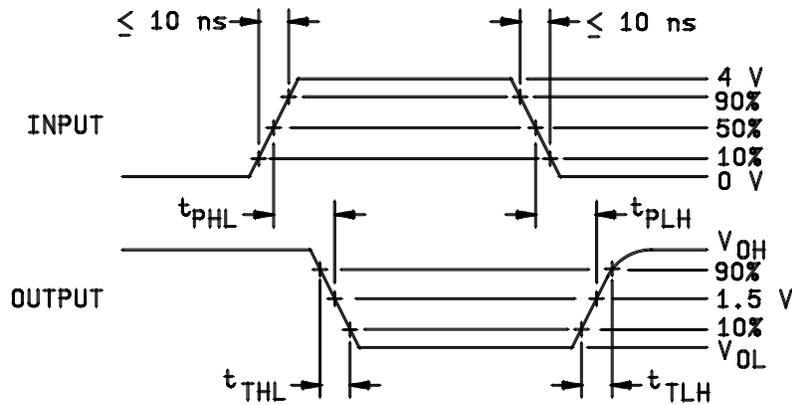


FIGURE 4. Timing waveforms.

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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-HDBK-103 (see 6.6 herein). The certificate of compliance submitted to DLA Land and Maritime -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 DLA Land and Maritime -VA shall be required for any change that affects this drawing.

3.9 Verification and review. DLA Land and Maritime, DLA Land and Maritime'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. 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.

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, 9, 10, 11
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

\* PDA applies to subgroup 1.

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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, 7, and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

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.

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 DLA Land and Maritime when a system application requires configuration control and the applicable SMD to that system. DLA Land and Maritime 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 DLA Land and Maritime-VA, telephone (614) 692-8108.

6.5 Comments. Comments on this drawing should be directed to DLA Land and Maritime-VA, Columbus, Ohio 43218-3990, or telephone (614) 692-0540.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-HDBK-103 and QML-38535. The vendors listed in MIL-HDBK-103 and QML-38535 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DLA Land and Maritime-VA.

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 14-07-31

Approved sources of supply for SMD 5962-86888 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 DLA Land and Maritime-VA. This information bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535. DLA Land and Maritime maintains an online database of all current sources of supply at <http://www.landandmaritime.dla.mil/Programs/Smcr/>.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>
5962-8688801CA	<u>3/</u>	SNJ55189J
	<u>3/</u>	SG55189J/883B
5962-86888012A	<u>3/</u>	SNJ55189FK
	<u>3/</u>	SG55189L/883B
5962-8688802CA	01295	SNJ55189AJ
5962-8688802DA	01295	SNJ55189AW
5962-86888022A	01295	SNJ55189AFK

- 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

01295

Vendor name  
and address

Texas Instruments, Incorporated  
Semiconductor Group  
8505 Forest Lane  
P.O. Box 660199  
Dallas, TX 75243  
Point of contact: U.S. Highway 75 South  
P.O. Box 84, M/S 853  
Sherman, TX 75090-9493

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