

REVISIONS																			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																
A	Add vendor CAGE 34333. Delete vendor CAGE 01295.	87 DEC 10	<i>M. A. Lyle</i>																
B	Delete vendor CAGE 34333. Add vendor CAGE 01295 for device 02 case outlines C and 2. Page 9, figure 3: Z_{OUT} should read $\approx 50\Omega$; t_w should read 500 ns. Device 01 is no longer available from an approved source. Editorial changes throughout.	88 OCT 6	<i>M. A. Lyle</i>																
C	Add a flat package, F-2 and make editorial changes throughout.	90 MAR 19	<i>M. A. Lyle</i>																

REV																			
SHEET																			
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SHEET																			
REV STATUS OF SHEETS	REV	C	C	C	C	C	C	C	C	C	C	C	C						
	SHEET	1	2	3	4	5	6	7	8	9	10	11							

PMIC N/A	PREPARED BY <i>Marcia B Kelleher</i>	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 <i>Ray Monnin</i>	MICROCIRCUIT, LINEAR, QUAD LINE RECEIVER, MONOLITHIC SILICON		
	APPROVED BY <i>M. A. Lyle</i>			
	DRAWING APPROVAL DATE 30 JULY 1987	SIZE A	CAGE CODE 67268	5962-86888
	REVISION LEVEL C	SHEET OF 1		

DESC FORM 193
SEP 87

• U.S. GOVERNMENT PRINTING OFFICE: 1987 — 748-129/60911

5962-E1665

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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 on-JAN devices".

<u>5962-86988</u>	<u>01</u>	<u>C</u>	<u>X</u>
<u>Drawing number</u>	<u>Device type (1.2.1)</u>	<u>Case outline (1.2.2)</u>	<u>Lead finish per MIL-M-38510</u>

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

<u>Outline letter</u>	<u>Case outline</u>
C	D-1 (14-lead, .785" X .310" X .200"), dual-in-line package
2	C-2 (20-terminal, .358" X .358" X .100"), square chip carrier package
D	F-2 (14-lead, .390" x .260" x .085"), flat package

Supply voltage	- - - - -	+10 V dc
Input voltage	- - - - -	±30 V dc
Storage temperature range	- - - - -	-65°C to +150°C
Maximum power dissipation (P_D)	- - - - -	1 W 1/ 2/
Lead temperature (soldering, 10 seconds)	- - - - -	+300°C
Thermal resistance, junction-to-case (θ_{JC})	- - - - -	See MIL-M-38510, appendix C
Junction temperature (T_J)	- - - - -	150°C

Supply voltage range (V_{CC})	- - - - -	+4.5 V dc to +5.5 V dc
Ambient operating temperature range (T_A)	- - - - -	-55°C to +125°C
High level output current (I_{OH})	- - - - -	-0.5 mA
Low level output current (I_{OL})	- - - - -	+10 mA

- 1/ Must withstand the added P_D due to short circuit test, e.g., I_{OS} .
2/ Derate linearly above $T_A = +25^\circ\text{C}$ at the rate of $6.7 \text{ mW}/^\circ\text{C}$ for cases C and 2 and $8.0 \text{ mW}/^\circ\text{C}$ for case D.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-86888
		REVISION LEVEL C	SHEET 2

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 Typical circuit. A typical circuit schematic is shown on figure 2.

3.2.3 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 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-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).

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-86888
		REVISION LEVEL C	SHEET 3

DESC FORM 193A
SEP 87

U. S. GOVERNMENT PRINTING OFFICE: 1989-749-033

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ 2/ $-55^{\circ}\text{C} < T_A < +125^{\circ}\text{C}$ $4.9\text{ V} < V_{CC} < 5.05\text{ V}$ unless otherwise specified	Device type	Group A subgroups	Limits		Unit
					Min	Max	
Positive-going threshold voltage	V_{T+}		01	1, 2, 3	0.6	1.9	V
			02	1, 2, 3	1.30	2.65	
Negative-going threshold voltage	V_{T-}		A11	1, 2, 3	0.35	1.60	V
Output low voltage	V_{OL}	$V_{CC} = \text{maximum}, V_I = 3\text{ V},$ $I_{OL} = 10\text{ mA}$	A11	1, 2, 3		.45	V
Output high voltage	V_{OH}	$V_{CC} = \text{minimum}, V_I = 0.75\text{ V}$	A11	1, 2, 3	2.6		V
		$I_{OH} = -0.5\text{ mA}$ Input open			2.6		
Input low current	I_{IL}	$V_I = -25\text{ V}$	A11	1, 2, 3	-3.6	-8.3	mA
		$V_I = -3\text{ V}$			-0.43		
Input high current	I_{IH}	$V_I = 25\text{ V}$	A11	1, 2, 3	3.6	8.3	mA
		$V_I = 3\text{ V}$			0.43		
Output short circuit current	I_{OS}	$V_I = 0\text{ V}, V_{CC} = \text{maximum}$	A11	1, 2, 3		-4.0	mA
Supply current	I_{CC}	$V_I = 5\text{ V}, V_{CC} = \text{maximum},$ Outputs open, $T_A = 25^{\circ}\text{C}$	A11	1		26	mA

See footnotes at end of table.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-86888
		REVISION LEVEL C	SHEET 4

DESC FORM 193A
SEP 87

U. S. GOVERNMENT PRINTING OFFICE: 1988-270-001

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ 2/ -55°C < T _A < +125°C 4.9 V < V _{CC} < 5.05 V unless otherwise specified	Device type	Group A subgroups	Limits		Unit	
					Min	Max		
Propagation delay input to output	t _{PLH}	See figures 3 and 4, R _L = 3.9 kΩ, C _L = 15 pF	A11	9		85	ns	
				10, 11		127		
	t _{PHL}	R _L = 390Ω, C _L = 15 pF		9		50		
				10, 11		75		
Transition time	t _{TLH}	See figures 3 and 4, R _L = 3.9 kΩ, C _L = 15 pF	A11	9		175	ns	
				10, 11		262		
	t _{THL}	R _L = 390Ω, C _L = 15 pF, See figures 3 and 4		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.

3.6 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.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A			5962-86888
		REVISION LEVEL C	SHEET 5	

DESC FORM 193A
SEP 87

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Device types	01 and 02	
Case outlines	C and D	2
Terminal number	Terminal symbols	
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 _{CC}	3A
15	- - -	NC
16	- - -	4Y
17	- - -	NC
18	- - -	4 CONTROL
19	- - -	4A
20	- - -	V _{CC}

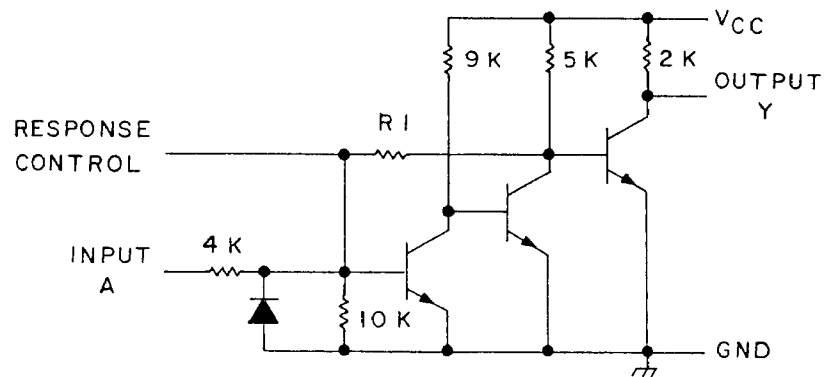
NC = No connection

FIGURE 1. Terminal connections.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A			5962-86888
		REVISION LEVEL C	SHEET 6	

DESC FORM 193A
SEP 87

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	Device type	
	01	02
R1	10 k	2 k

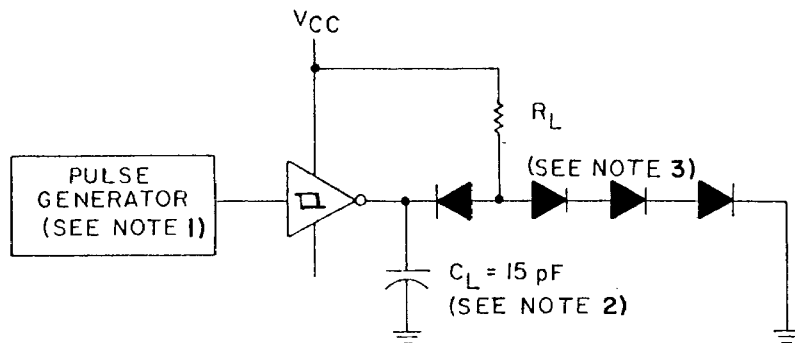
Resistor values shown are nominal and in ohms.

FIGURE 2. Typical circuit.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-86888
		REVISION LEVEL C	SHEET 7

DESC FORM 193A
SEP 87

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NOTES:

1. The pulse generator has the following characteristics: $Z_{OUT} \approx 50\Omega$, $t_w = 500$ 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.

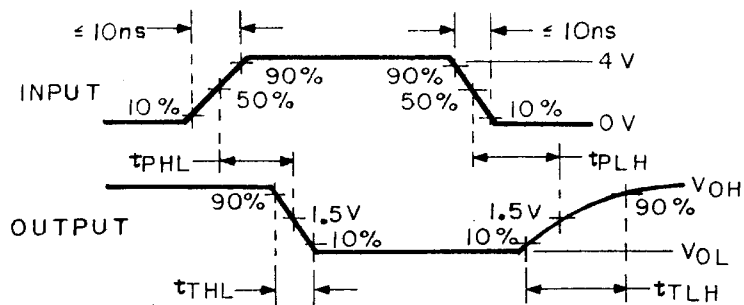


FIGURE 4. Voltage waveforms.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-86888
		REVISION LEVEL C	SHEET 8

DESC FORM 193A
SEP 87

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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 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 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 and method 1005 of MIL-STD-883.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-86888
		REVISION LEVEL C	SHEET 9

DESC FORM 193A
SEP 87

U. S. GOVERNMENT PRINTING OFFICE: 1989-749-033

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

* PDA applies to subgroup 1.

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.

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 Electronic 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 (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.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A	5962-86888	
		REVISION LEVEL C	SHEET 10

DESC FORM 193A
SEP 87

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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 to the date of the last action of this document.

Military drawing part number	Vendor CAGE number	Vendor similar part number <u>1/</u>
5962-8688801CX	<u>2/</u>	SG55189J/883B
5962-86888012X	<u>2/</u>	SG55189L/883B
5962-8688802CX	01295	SNJ55189AJ
5962-8688802DX	01295	SNJ55189AW
5962-86888022X	01295	SNJ55189AFK

- 1/ Caution: Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.
- 2/ Device 01 is no longer available from an approved source of supply.

Vendor CAGE number

01295

Vendor name and address

Texas Instruments, Inc.
13500 N. Central Expressway
P.O. Box 655303
Dallas, TX 75265
Point of contact: I-20 at FM 1788
Midland, TX 79711-0448

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-86888
		REVISION LEVEL C	SHEET 11

DESC FORM 193A
SEP 87

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