National Semiconductor

MILITARY DATA SHEET

MNLM711AM-X REV 1A0

Original Creation Date: 10/26/95
Last Update Date: 11/10/95
Last Major Revision Date: 10/26/95

DUAL HIGH SPEED DIFFERENTIAL COMPARATOR

General Description

The LM711 is a dual differential voltage comparator featuring high accuracy, fast response times, large input voltage range, low power consumption and compatibility with practically all integrated logic forms. When used as a sense amplifier, the threshold voltage can be adjusted over a wide range, almost independent of the integrated circuit characteristics. Independent strobing of each comparator channel is provided, and pulse stretching on the output is easily accomplished. Other applications of the dual comparator include a window discriminator in pulse height detectors and a double ended limit detector for automatic Go-No-Go test equipment.

Industry Part Number

LM711AM

NS Part Numbers

LM711AMH/883
LM711AMJ/883
LM711AMW/883

Prime Die

LM711AM

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (^{o}C)
1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55

Features

- Fast Response Time
- Low Offset Voltage
- Low Offset Current
- Independent Comparator Strobing

(Absolute Maximum Ratings)

Storage Temperature Range	-65 C to 175 C
Operating Temperature Range	-55 C to 125 C
Lead Temperature (Soldering, 60 seconds)	300 C
Internal Power Dissipation (Note 1)	
Can	350mW
DIP	400mW
Flatpack	330mW
Positive Supply Voltage	14V
Negative Supply Voltage	-7V
Peak Output Current	50mA
Differential Input Voltage	±5V
Input Voltage	±7V
Strobe Voltage	0V to 6V
Short Circuit Duration	10s
Thermal Resistance	
ThetaJA	
H-Package (Still Air)	211 C/W
(500LF/Min Air flow)	120 C/W
J-Package (Still Air)	126 C/W
(500LF/Min Air flow)	70 C/W
W-Package (Still Air)	250 C/W
(500LF/Min Air flow)	152 C/W
ThetaJC	
H-Package	37 C/W
J-Package	24 C/W
W-Package	42 C/W

Note 1: Rating applies to ambient temperatures up to 125 C. Above 125 C ambient, derate linearly at 150 C/W for the Can and Flatpack and 120 C/W for the Dip.

Electrical Characteristics

DC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Vcc+ = 12V, Vcc- = -6V

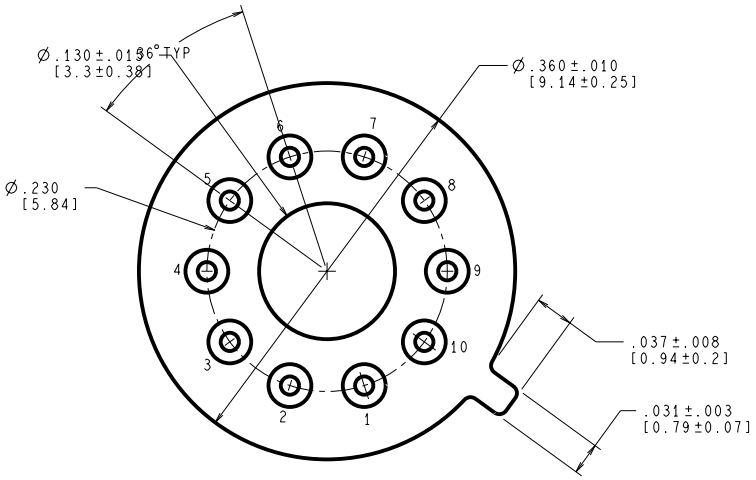
SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Vio	Input Offset Voltage	Vcc- = -7V, Rs = 200 Ohms, Vcm = +5V	1		-5	5	mV	1
			1		-6	6	mV	2, 3
		Vcc- = -7V, Rs = 200 Ohms, Vcm = -5V	1		-5	5	mV	1
			1		-6	6	mV	2, 3
		Vcm = 0V, Rs = 200 Ohms	1		-3.5	3.5	mV	1
			1		-4.5	4.5	mV	2, 3
		Vcm = 0V, Rs = 50 Ohms	1		-3.5	3.5	mV	1
			1		-4.5	4.5	mV	2, 3
Iio	Input Offset Current	Vcm = 0V	1			10	uA	1
			1			20	uA	2, 3
Iib	Input Bias Current	Vout = Vol, Vcm = 0V				75	uA	1
						150	uA	2, 3
Avs	Voltage Gain				750		V	1
					500		V	2, 3
Voh	Positive Output Level	Vin = 10mV, Io = 0mA			2.5	5	V	1, 2, 3
		Vin = 10mV, Io = 5mA			2.5	5	V	1, 2, 3
Vol	Negative Output Level	Vin = -10mV, Io = 0mA			-1	0	V	1, 2, 3
OD Vol	Over Driven Negative Output Level	Vin = 5V, Io = 0mA			-1	0	V	1, 2, 3
Isink	Output Sink Current	Vin = -10mV, Vo = 0V			0.5		mA	1
					0.12		mA	2
					0.25		mA	3
Icc+	Power Supply Current	Vin = -5mV, Vout = Gnd	2			13.3	mA	1, 2, 3
Icc-	Power Supply Current	Vin = -5mV, Vout = Gnd	2		-6.1		mA	1, 2, 3
Istrobe	Strobe Current	Vin = 10mV, Vst = 100mV				2.5	mA	1, 2, 3
Vo(ST)	Strobed Output	Vst = .3V			-1	0	V	1, 2, 3
CMRR	Common Mode Rejection Ratio	Vcc- = -7V, Vcm = $\pm$5V, Rs = 200 Ohms			80		dB	1, 2, 3

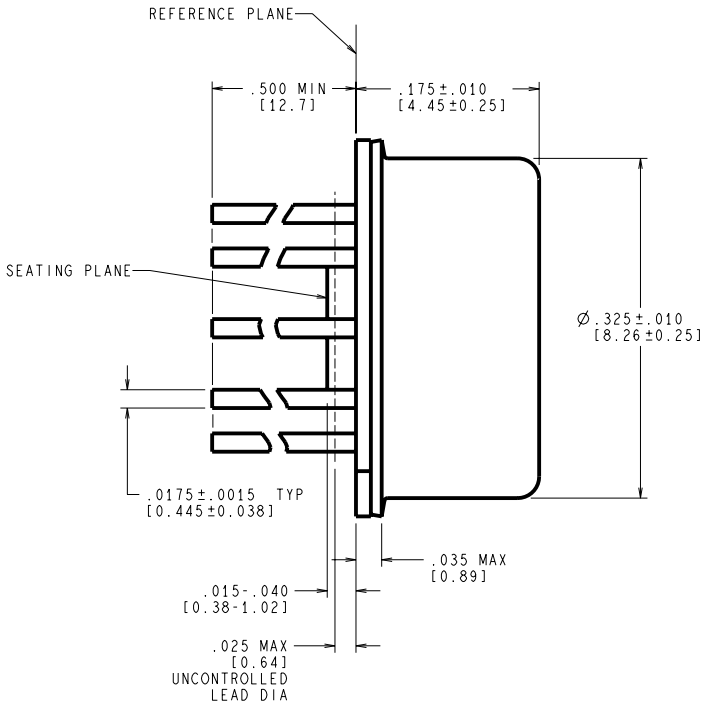
Graphics and Diagrams

GRAPHICS#	DESCRIPTION
5970HRA2	10LD .230DIA PC TO-100 METAL CAN PKG H (B/I CKT)
6202HRA1	CERDIP (J), 14 LEAD (B/I CKT)
6209HRA1	CERPAC (W), 10 LEAD (B/I CKT)
8356HRA1	10LD .230DIA PC TO-100 METAL CAN H(B/I CKT)
H10CRF	10LD .230DIA PC TO-100 METAL CAN H(P/P DWG)
J14ARH	CERDIP (J), 14 LEAD (P/P DWG)
P000030A	10LD .230DIA PC TO-100 METAL CAN H(PIN OUT)
P000110A	CERDIP (J), 14 LEAD (PIN OUT)
P000111A	CERPAC (W), 10 LEAD (PIN OUT)
W10ARG	CERPAC (W), 10 LEAD (P/P DWG)

See attached graphics following this page.

REVISIONS				
LTR	DESCRIPTION	E.C.N.	DATE	BY/APP'D
F	REVISE & REDRAW PER CURRENT STANDARD; UPDATE MIL/AERO STAMP & TITLE.	11003	06/26/95	MS/





CONTROLLING DIMENSION IS INCH
VALUES IN [] ARE MILLIMETERS

MIL-I-38535
CONFIGURATION CONTROL

NOTES: UNLESS OTHERWISE SPECIFIED

1. LEADS TO BE LOCATED WITHIN .007 IN/ 0.18 mm OF THEIR TRUE POSITIONS RELATIVE TO A MAXIMUM WIDTH TAB.
2. STANDARD METAL CAN TYPE: SOLID BASE WITH CERAMIC STANDOFF.
3. APPLIES TO MIL-AERO AND LINEAR PRODUCTS.
4. REFERENCE JEDEC REGISTRATION TO-100, JEDEC PUBLICATION No.95.

APPROVALS	DATE
DRAWN: MARTA SUCHY	06/26/95
DFTG. CHK.	
ENGR. CHK.	

National Semiconductor
2900 Semiconductor dr, Santa Clara, CA 95052-8090

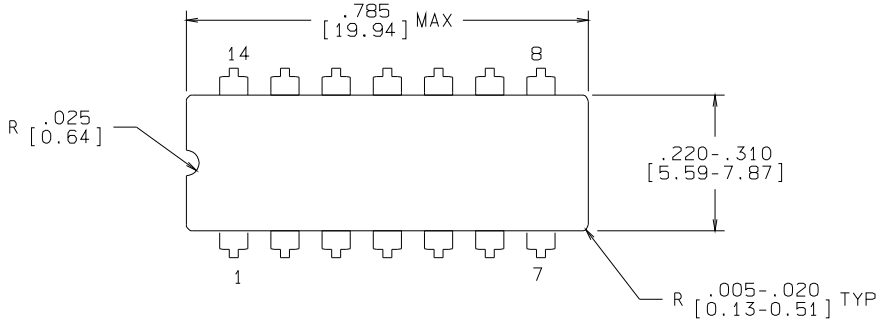
METAL CAN, TO-100, 10 LEAD, .230 DIA P.C.

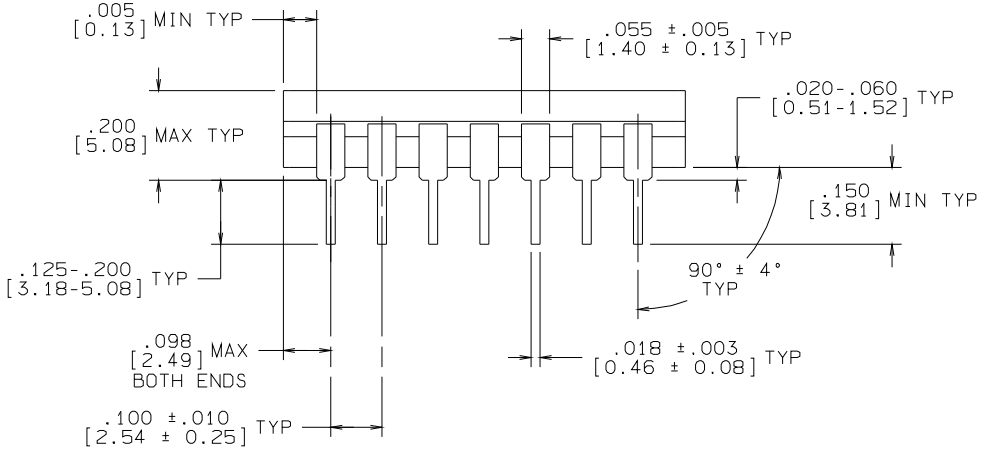
PROJECTION
INCH [MM]

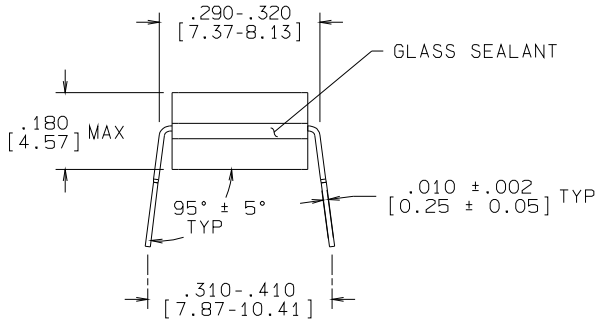
SCALE	SIZE	DRAWING NUMBER	REV
N/A	C	MKT-H10C	F

DO NOT SCALE DRAWING | SHEET 1 of 1

REVISIONS				
LTR	DESCRIPTION	E.C.N.	DATE	BY/APP'D
H	REVISE PER CURRENT STD; REDRAW	10001	09/15/93	TL/







MIL/AERO CONFIGURATION CONTROL

MIL-M-38510 CONFIGURATION CONTROL

CONTROLLING DIMENSION: INCH

NOTES: UNLESS OTHERWISE SPECIFIED

1. LEAD FINISH TO BE 200 MICROINCHES / 5.08 MICROMETERS MINIMUM SOLDER MEASURED AT THE CREST OF THE MAJOR FLATS.
2. JEDEC REGISTRATION MO-036, VARIATION AB, DATED 04/1981.

APPROVALS	DATE
DRAWN T. LEQUANG	09/15/93
DFTG. CHK.	
ENGR. CHK.	
APPROVAL	

PROJECTION

INCH [MM]

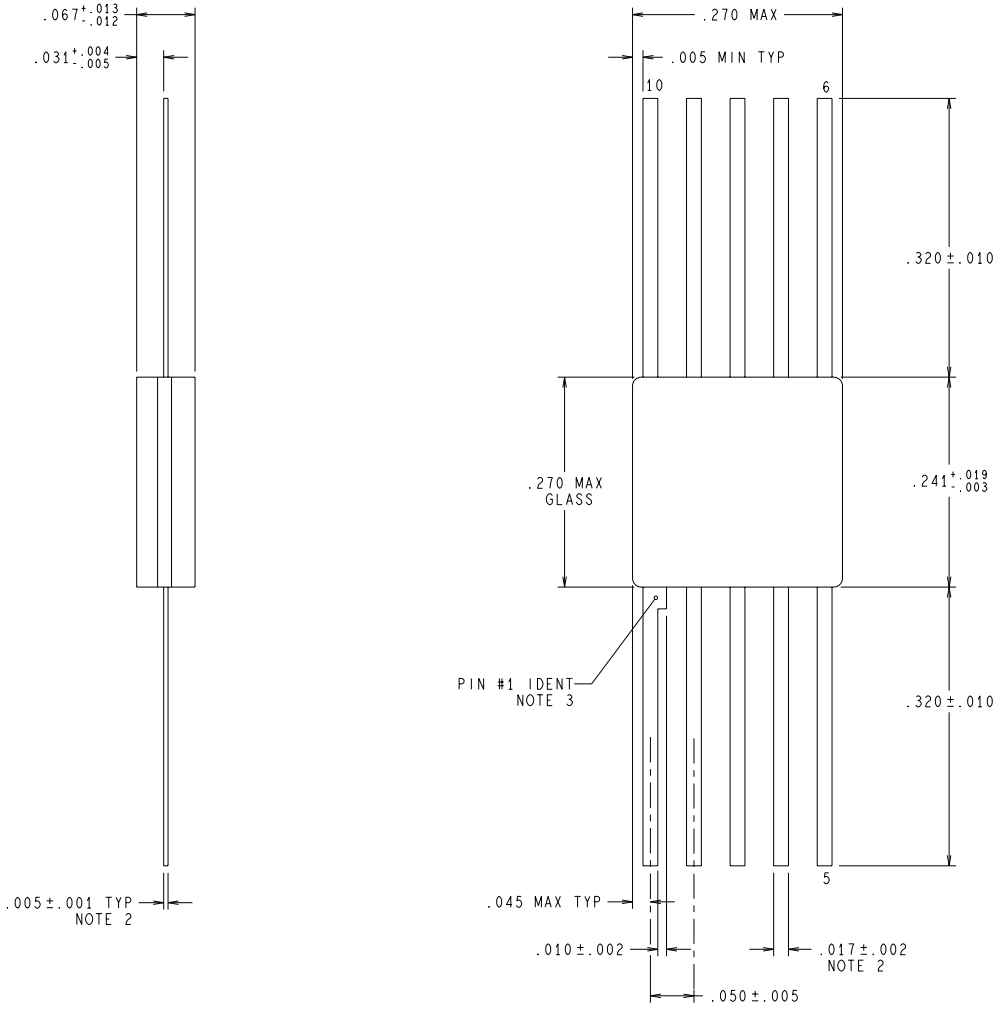
NATIONAL SEMICONDUCTOR CORPORATION
2900 Semiconductor Drive, Santa Clara, CA 95052-8090

CERDIP (J), 14 LEAD,

SCALE	SIZE	DRAWING NUMBER	REV
N/A	B	MKT-J14A	H

DO NOT SCALE DRAWING | SHEET 1 OF 1

REVISIONS				
LTR	DESCRIPTION	E.C.N.	DATE	BY/APP'D
F	REVISE AND REDRAW PER NEW STANDARD.	10510	07/28/94	DEG/AEP
G	.017±.002 WAS .017±.020.	10654	10/21/94	DEG/



NOTES: UNLESS OTHERWISE SPECIFIED.

1. LEAD FINISH: SOLDER DIPPED WITH Sn60 OR Sn63 SOLDER CONFORMING TO MIL-M-38510 TO A MINIMUM THICKNESS OF 200 MICROINCHES. SOLDER MAY BE APPLIED OVER LEAD BASIS METAL OR Sn PLATE.
2. MAXIMUM LIMIT MAY BE INCREASED BY .003 INCHES AFTER LEAD FINISH APPLIED.
3. LEAD 1 IDENTIFICATION SHALL BE:
   a) A NOTCH OR OTHER MARK WITHIN THIS AREA
   b) A TAB ON LEAD 1, EITHER SIDE
4. REFERENCE JEDEC REGISTRATION MO-003, VARIATION AG, DATED 06/01/76.

MIL/AERO CONFIGURATION CONTROL

MIL-M-38510 CONFIGURATION CONTROL

APPROVALS	DATE
DRAWN: D.E.Grady	07/28/94
DFTG. CHK.	
ENGR. CHK.	

National Semiconductor
2900 Semiconductor dr, Santa Clara, CA 95052-8090

CERPACK, 10 LEAD

PROJECTION — INCH [MM]

SCALE	SIZE	DRAWING NUMBER	REV
N/A	C	MKT-W10A	G

DO NOT SCALE DRAWING — SHEET 1 of 1