National Semiconductor

MILITARY DATA SHEET

MNLM760-X REV 1A0

Original Creation Date: 11/30/95
Last Update Date: 01/30/96
Last Major Revision Date: 11/30/95

HIGH SPEED DIFFERENTIAL COMPARATOR

General Description

The LM760 is a differential voltage comparator offering considerable speed improvement over the LM710 family and operates from symmetric supplies of ±4.5V to ±6.5V. The LM760 can be used in high speed analog-to-digital conversion systems and as a zero crossing detector in disc file and tape amplifiers. The LM760 output features balanced rise and fall times for minimum skew and close matching between the complementary outputs. The outputs are TTL compatible with a minimum sink capability of two gate loads.

Industry Part Number

LM760

NS Part Numbers

LM760H/883*
LM760J/883**

Prime Die

LM7760A

Controlling Document

5962-8754501GA*,CA**

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (°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

- Guaranteed high speed-25nS response time.
- Guaranteed delay matching on both outputs.
- Complementary TTL compatible outputs.
- High sensitivity.
-Standard supply voltages.

Applications

- High speed A-to-D.
- Peak or zero detector.

(Absolute Maximum Ratings)
(Note 1)

Storage Temperature Range	-65 C to +150 C
Operating Temperature Range	-55 C to +125 C
Maximum Junction Temperature	150 C
Lead Temperature	
Ceramic DIP (Soldering, 60 seconds)	300 C
Internal Power Dissipation (Note 2)	
8L-Metal Can	1.00W
8L-Ceramic DIP	1.30W
Positive Supply Voltage	+8.0V
Negative Supply Voltage	-8.0V
Peak Output Current	10mA
Differential Input Voltage	$\pm$5.0V
Input Voltage	V+ $\geq$ VI $\geq$ V-
Thermal Resistance	
ThetaJA	
(Still Air)	110 C/W
(500LF/Min Air flow)	TBD
ThetaJC	TBD
ESD Susceptibility	TBD

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific perofrmance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed. Some performance characteristics may degrade when the device is not operated under the listed test conditions.
Note 2: Ratings apply to ambient temperature at 25 C.

Electrical Characteristics

DC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Vs = ±4.5V to ±6.5V

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Icc+	Positive Supply Current	Vs = ±6.5V				32	mA	1, 2, 3
Icc-	Negative Supply Current	Vs = ±6.5V			-16		mA	1, 2, 3
Ib	Input Bias Current	Vicm = 0V, Vo = Open, Vs = ±4.5V				60	uA	1, 2, 3
		Vicm = 0V, Vo = Open, Vs = ±6.5V				60	uA	1, 2, 3
Iio	Input Offset Current	Vs = ±4.5V			-7.5	7.5	uA	1, 2, 3
		Vs = ±6.5V			-7.5	7.5	uA	1, 2, 3
Vio	Input Offset Voltage	Vo = +1.4V, Vs = ±4.5V, Rs = 50 Ohms			-6.0	6.0	mV	1
		Vo = +1.0V, Vs = ±4.5V, Rs = 50 Ohms			-6.0	6.0	mV	2
		Vo = +1.8V, Vs = ±4.5V, Rs = 50 Ohms			-6.0	6.0	mV	3
		Vo = +1.4V, Vs = ±6.5V, Rs = 50 Ohms			-6.0	6.0	mV	1
		Vo = +1.0V, Vs = ±6.5V, Rs = 50 Ohms			-6.0	6.0	mV	2
		Vo = +1.8V, Vs = ±6.5V, Rs = 50 Ohms			-6.0	6.0	mV	3
Voh(b)	Output Voltage (HIGH)	Iout = 80uA, Vs = ±4.5V, Vin = 20mV			2.4		V	1, 2, 3
		Iout = 0mA, Vs = ±5.0V, Vin = 20mV			2.4		V	1, 2, 3
		Iout = 5.0mA, Vs = ±6.5V, Vin = 20mV			2.4		V	1, 2, 3
		Iout = 5.0mA, Vs = ±6.5V, Vin=20mV			2.4		V	1, 2, 3
		Vs = ±6.5V, Vin = 20mV, Vcm = -4V			2.4		V	1, 2, 3
		Vs = ±6.5V, Vin = 20mV, Vcm = +4V			2.4		V	1, 2, 3

Electrical Characteristics

DC PARAMETERS(Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Vs = ±4.5V to ±6.5V

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Voh(a)	Output Voltage (HIGH)	Iout = 80uA, Vs = ±4.5V, Vin = 20mV			2.4		V	1, 2, 3
		Iout = 5.0mA, Vs = ±5.0V, Vin = 20mV			2.4		V	1, 2, 3
		Iout = 0mA, Vs = ±5.0V, Vin = 20mV			2.4		V	1, 2, 3
		Iout = 5.0mA, Vs = ±6.5V, Vin = 20mV			2.4		V	1, 2, 3
		Vs = ±6.5V, Vin = 20mV, Vcm = -4V			2.4		V	1, 2, 3
		Vs = ±6.5V, Vin = 20mV, Vcm = +4V			2.4		V	1, 2, 3
Vol(a)	Output Voltage (LOW)	Vs = ±4.5V, Isink = 3.2mA, Vin = 20mV				0.4	V	1, 2, 3
		Vs = ±6.5V, Isink = 3.2mA, Vin = 20mV				0.4	V	1, 2, 3
		Vs = ±6.5V, Vin = 20mV, Vcm = -4V				0.4	V	1, 2, 3
		Vs = ±6.5V, Vin = 20mV, Vcm = +4V				0.4	V	1, 2, 3
Vol(b)	Output Voltage (LOW)	Vs = ±4.5V, Isink = 3.2mA, Vin = 20mV				0.4	V	1, 2, 3
		Vs = ±6.5V, Isink = 3.2mA, Vin = 20mV				0.4	V	1, 2, 3
		Vs = ±6.5V, Vin = 20mV, Vcm = -4V				0.4	V	1, 2, 3
		Vs = ±6.5V, Vin = 20mV, Vcm = +4V				0.4	V	1, 2, 3
Vir	In Voltage Range	Vs = ±6.5V	1		±4.0		V	1, 2, 3
tPLH1(a)	Response Time		3, 4			25	nS	9
tPHL2(a)	Response Time		3, 4			25	nS	9
tPHL1(a)	Response Time		3, 4			25	nS	9
tPLH2(a)	Response Time		3, 4			25	nS	9
tPLH1(b)	Response Time		2, 4			30	nS	9
tPHL2(b)	Response Time		2, 4			30	nS	9
tPHL1(b)	Response Time		2, 4			30	nS	9
tPLH2(b)	Response Time		2, 4			30	nS	9

Electrical Characteristics

DC PARAMETERS(Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)
DC: Vs = ±4.5V to ±6.5V

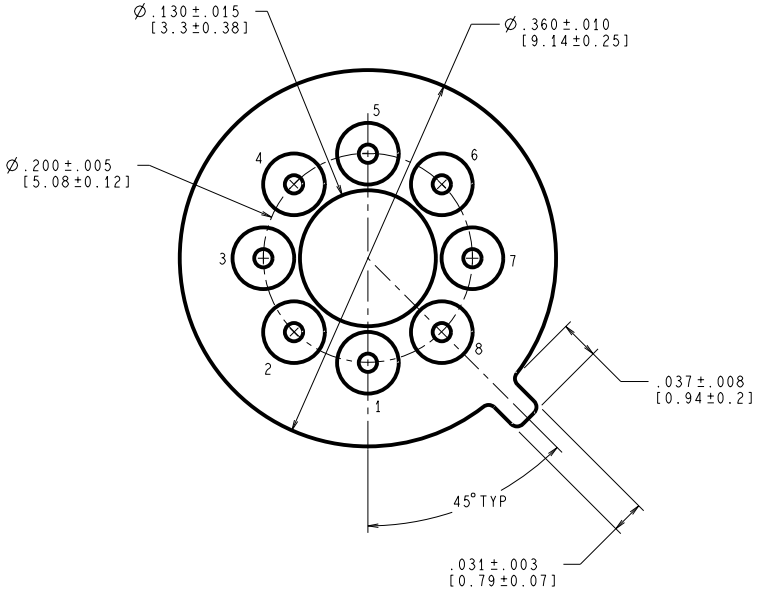
SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tPLH1-tPHL2	Response Time		2, 4			5	nS	9
tPLH2-tPHL1	Response Time		2, 4			5	nS	9
tPLH1-tPLH2	Response Time		2, 4			7.5	nS	9
tPHL1-tPHL2	Response Time		2, 4			7.5	nS	9

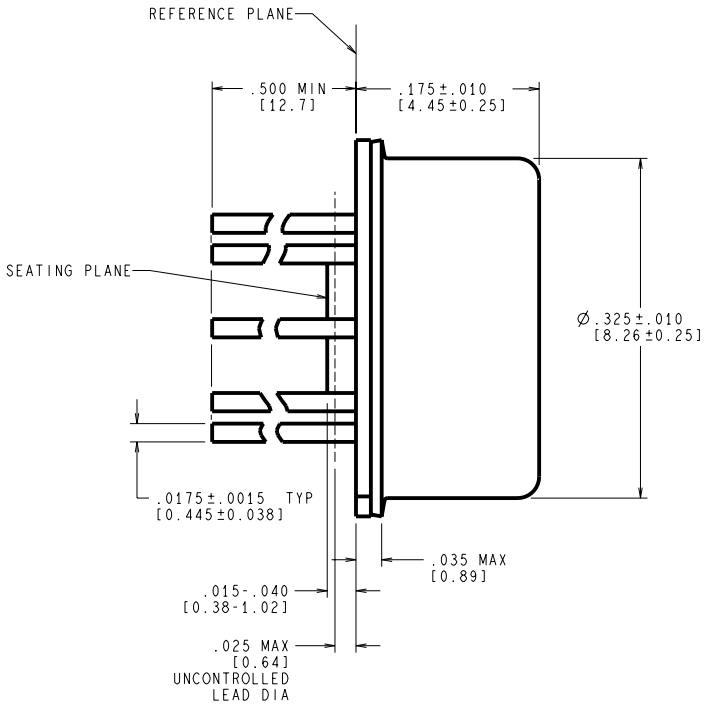
Graphics and Diagrams

GRAPHICS#	DESCRIPTION
6090HRA1	CERDIP (J), 14 LEAD (B/I CKT)
6091HRA1	8LD .200 DIA P.C. TO-99 METAL CAN (H)(B/I CKT)
H08CRF	8LD .200 DIA P.C. TO-99 METAL CAN(H)(P/P DWG)
J14ARH	CERDIP (J), 14 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.	11002	06/22/95	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-99, JEDEC PUBLICATION No.95.

APPROVALS	DATE
DRAWN: MARTA SUCHY	06/22/95
DFTG. CHK.	
ENGR. CHK.	

PROJECTION — INCH [MM]

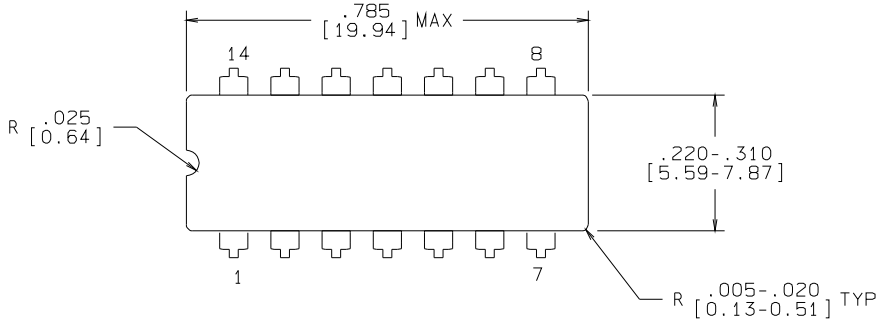
National Semiconductor
2900 Semiconductor dr, Santa Clara, CA 95052-8090

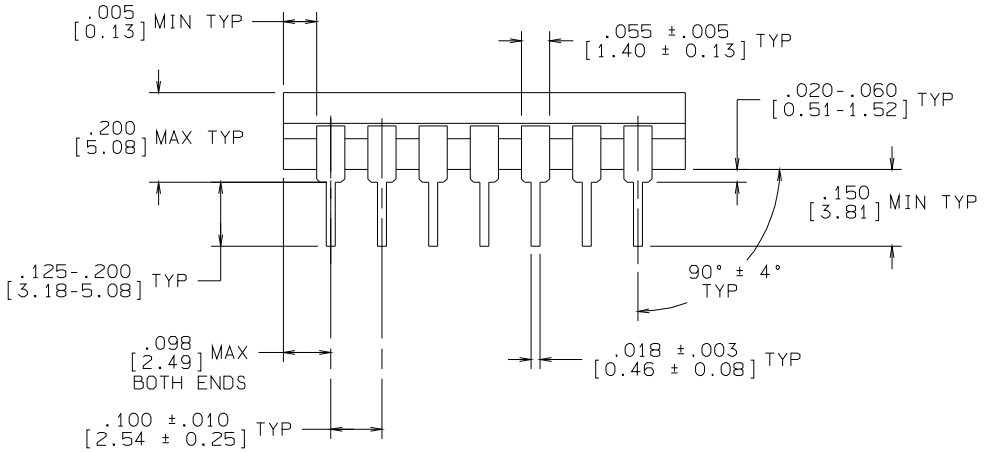
METAL CAN, TO-99, 8 LEAD, .200 DIA P.C.

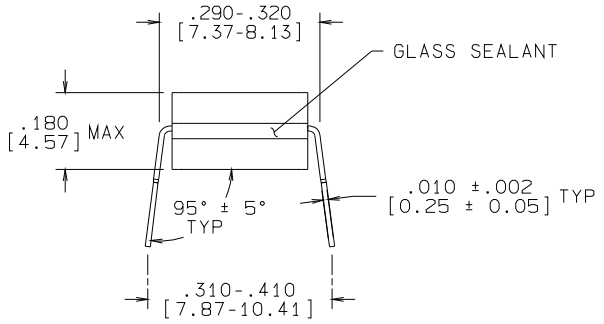
SCALE	SIZE	DRAWING NUMBER	REV
N/A	C	MKT-H08C	F

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/







CONTROLLING DIMENSION: INCH

MIL/AERO CONFIGURATION CONTROL

MIL-M-38510 CONFIGURATION CONTROL

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