

MNLM1558-X REV 0B0

 Original Creation Date: 06/08/95
 Last Update Date: 12/10/96
 Last Major Revision Date: 06/08/95

DUAL OPERATIONAL AMPLIFIER
General Description

The LM1558 is a general purpose dual operational amplifier. The two amplifiers share a common bias network and power supply leads. Otherwise, their operation is completely independent.

Industry Part Number

LM1558

NS Part Numbers

 LM1558H/883
 LM1558J/883

Prime Die

LM1558

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

- No frequency compensation required
- Short-circuit protection
- Wide common-mode and differential voltage ranges
- Low-power consumption
- 8-lead can and 8-lead mini DIP
- No latch up when input common mode range is exceeded

(Absolute Maximum Ratings)

(Note 1)

Supply Voltage	±22V
Power Dissipation	500mW
METAL CAN	TBD
CERDIP	TBD
Differential Input Voltage	±30V
Input Voltage	±15V
(Note 2)	
Output Short-Circuit Duration	Continuous
Operating Temperature Range	-55 C to +125 C
Maximum Junction Temperature	150 C
Storage Temperature Range	-65 C to +150 C
Lead Temperature (Soldering 10 seconds)	260 C
Thermal Resistance	
ThetaJA	
METAL CAN (Still Air)	TBD
(500LF/Min Air flow)	TBD
CERDIP (Still Air)	TBD
(500LF/Min Air flow)	TBD
ThetaJC	
METAL CAN	TBD
CERDIP	TBD
ESD Tolerance	
(Note 3)	300V

Note 1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed.

Note 2: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

Note 3: Human body model, 1.5K Ohms in series with 100pF.

Electrical Characteristics

DC PARAMETERS:

(The following conditions apply to all the following parameters, unless otherwise specified.)

DC: $V_{cc} = \pm 15V$, $V_{cm} = 0V$, $R_s = 10K$ Ohms

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Vio	Input Offset Voltage	$V_{cm} = -12V$			-5	5	mV	1
					-6	6	mV	2, 3
		$V_{cm} = +12V$			-5	5	mV	1
					-6	6	mV	2, 3
		$V_{cm} = 0$			-5	5	mV	1
					-6	6	mV	2, 3
		$V_{cc} = 0, R_s = 50$			-5	5	mV	1
					-6	6	mV	2, 3
$V_{cc} = \pm 5V, V_{cm} = 0$			-5	5	mV	1		
			-6	6	mV	2, 3		
Iio	Input Offset Current	$V_{cm} = -12V$			-200	200	nA	1
					-500	500	nA	2, 3
		$V_{cm} = +12V$			-200	200	nA	1
					-500	500	nA	2, 3
		$V_{cm} = 0$			-200	200	nA	1
					-500	500	nA	2, 3
$V_{cc} = \pm 5V, V_{cm} = 0$			-200	200	nA	1		
			-500	500	nA	2, 3		
Iib	Input Bias Current	$V_{cm} = -12V$				500	nA	1
						1500	nA	2, 3
		$V_{cm} = +12V$				500	nA	1
						1500	nA	2, 3
		$V_{cm} = 0$				500	nA	1
						1500	nA	2, 3
$V_{cc} = \pm 5V, V_{cm} = 0$				500	nA	1		
				1500	nA	2, 3		
PSRR	Power Supply Rejection Ratio	$\pm 5V, \leq V_{cc} \leq 15V$			77		dB	1, 2, 3
CMRR	Common Mode Rejection Ratio	$-12V \leq V_{cm} \leq 12V$			70		dB	1, 2, 3

Electrical Characteristics

DC PARAMETERS: (Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)

DC: $V_{cc} = \pm 15V$, $V_{cm} = 0V$, $R_s = 10K$ Ohms

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS	
I _{cc}	Power Supply Current	R _s = 50 (Both Amplifiers Measured Together)				5	mA	1, 2	
						7	mA	3	
+I _{os}	Short Circuit Current	R _s = 50, V _{out} = 0V				-45	-14	mA	1
						-45	-9	mA	2
						-50	-9	mA	3
-I _{os}	Short Circuit Current	R _s = 50, V _{out} = 0V				14	45	mA	1
						9	45	mA	2
						9	50	mA	3
V _{in}	Input Voltage Range		1		-12	12	V	1, 2, 3	
R _{IN}	Input Resistance	(R _{IN} = 5KT/qI _b)	2		0.3		M Ohms	1	
V _{op+}	Output Voltage Swing	R _s = 50, R _L = 10K Ohms, V _{cc} = ±20V			16		V	4, 5, 6	
		R _s = 50, R _L = 2K Ohms, V _{cc} = ±20V			15		V	4, 5, 6	
		R _s = 50, R _L = 10K Ohms			12		V	4, 5, 6	
		R _s = 50, R _L = 2K Ohms			10		V	4, 5, 6	
V _{op-}	Output Voltage Swing	R _s = 50, R _L = 10K Ohms, V _{cc} = ±20V				-16	V	4, 5, 6	
		R _s = 50, R _L = 2K Ohms, V _{cc} = ±20V				-15	V	4, 5, 6	
		R _s = 50, R _L = 10K Ohms				-12	V	4, 5, 6	
		R _s = 50, R _L = 2K Ohms				-10	V	4, 5, 6	
A _{vs+}	Large Signal Voltage Gain	R _s = 50, R _L = 2K, V _o = 10V				50		V/mV	4
						25		V/mV	5, 6
A _{vs-}	Large Signal Voltage Gain	R _s = 50, R _L = 2K, V _o = -10V				50		V/mV	4
						25		V/mV	5, 6

Electrical Characteristics

AC PARAMETERS:

(The following conditions apply to all the following parameters, unless otherwise specified.)
 AC: $V_{cc} = \pm 15V$, $V_{cm} = 0$

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Sr+	Slew Rate	Vin = -5 to 5V			0.2		V/uS	9
		Vin = 5 to -5V, RL = 2K, CL = 100pF	2		0.2		V/uS	9
Sr-	Slew Rate	Vin = -5 to 5V			0.2		V/uS	9
		Vin = 5 to -5V, RL = 2K, CL = 100pF	2		0.2		V/uS	9
Gbw	Gain Bandwidth	Vin = 50mVrms, F = 20KHz, Rs = 50, RL = 2K			250		KHz	9
tr	Rise Time	RL = 2K Ohms, CL = 100pF	2			1	uS	9
os	Overshoot	RL = 2K Ohms, CL = 100pF	2			30	%	9

DC PARAMETERS: DRIFT VALUES

(The following conditions apply to all the following parameters, unless otherwise specified.)
 DC: $V_{cc} = \pm 15V$, $V_{cm} = 0V$, $R_s = 10K$ Ohms. "Deltas not required on B-Level product. Deltas required for S-Level product ONLY as specified on Internal Processing Instructions (IPI)."

Vio	Input Offset Voltage	$V_{cm} = 0$			-1	1	mV	1
Iio	Input Offset Current	$V_{cm} = 0$			-20	20	nA	1

Note 1: Guaranteed by the CMRR test.

Note 2: Guaranteed parameter not tested.

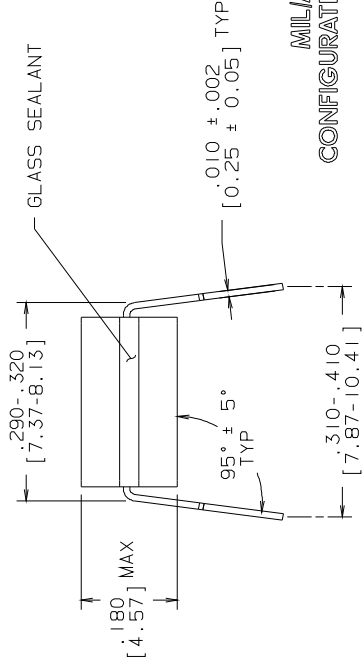
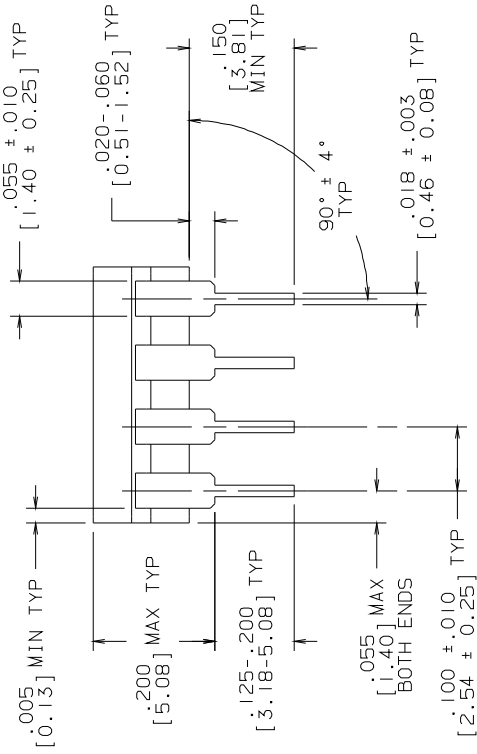
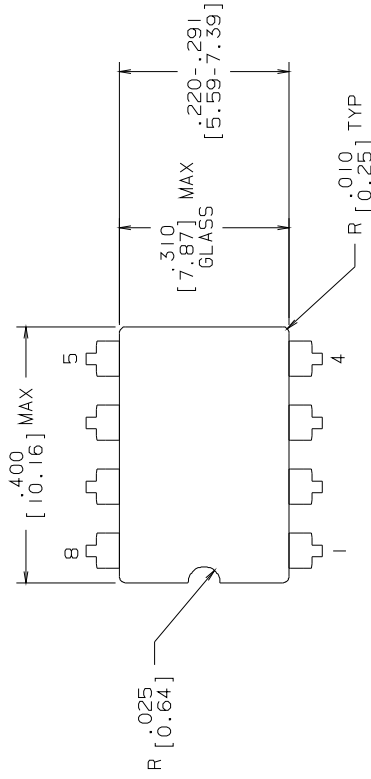
Graphics and Diagrams

GRAPHICS#	DESCRIPTION
H08CRE	(blank)
J08ARL	CERDIP (J), 8 LEAD (P/P DWG)

See attached graphics following this page.

REV I S I O N S

LTR	DESCRIPTION	E. C. N.	DATE	BY/APP'D
L	REVISE PER CURRENT STD; REDRAW	10002	09/21/93	TL/



MILIAERO
 CONFIGURATION CONTROL
 MIL-M-38510
 CONFIGURATION CONTROL

CONTROLLING DIMENSION: INCH

APPROVALS	DATE	NATIONAL SEMICONDUCTOR CORPORATION
DRAWN: T. LEQUANG	09/21/93	2900 Semiconductor Drive, Santa Clara, CA 95052-8090
DFTG. CHK.		
ENGR. CHK.		
APPROVAL		

CERDIP (J),
 8 LEAD

PROJECTION	SCALE	SIZE	DRAWING NUMBER	REV
	N/A	B	MKT-J08A	L
	DO NOT SCALE DRAWING	SHEET	OF	I

NOTES: UNLESS OTHERWISE SPECIFIED

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