

MNLMH6715-X-RH REV 0A0

 Original Creation Date: 04/14/03
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 Last Major Revision Date:

**DUAL WIDEBAND VIDEO OP AMP, GUARANTEED TO 300k rd(Si)
 TESTED TO MIL-STD-883, METHOD 1019**
General Description

The LMH6715 combines National's VIP10(TM) high speed complementary bipolar process with National's current feedback topology to produce a very high speed dual op amp. The LMH6715 provides a 400MHz small signal bandwidth at a gain of +2V/V and a 1300V/us slew rate while consuming only 5.8mA per amplifier from ±5V supplies.

The LMH6715 offers exceptional video performance with its 0.02% and 0.02 degrees differential gain and phase errors for NTSC and PAL video signals while driving up to four back terminated 75 Ohm loads. The LMH6715 also offers a flat gain response of 0.1dB to 100MHz and very low channel-to-channel crosstalk of -70dB at 10MHz. Additionally, each amplifier can deliver 70mA of output current. This level of performance makes the LMH6715 an ideal dual op amp for high-density broadcast-quality video systems.

The LMH6715's two very well matched amplifiers support a number of applications such as differential line drivers and receivers. In addition, the LMH6715 is well suited for Sallen Key active filters in applications such as anti-aliasing filters for high-speed A/D converters. Its low power requirement, low noise and distortion allow the LMH6715 to serve portable RF applications such as IQ-channels.

Industry Part Number

LMH6715

Prime Die

LMH6715A

NS Part Numbers

 LMH6715J-QML
 LMH6715J-QMLV
 LMH6715JFQML
 LMH6715JFQMLV

Controlling Document

SEE FEATRUES SECTION

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

Ta = 25 C, Rl = 100 Ohms, typical values unless specified.

- Very low diff. gain, phase: 0.02%, 0.02degrees
- Wide bandwidth: 480MHz (Av = +1V/V)
400MHz (Av = +2V/V)
- 0.1dB gain flatness to 100MHz
- Low power: 5.8mA/channel
- 70dB channel-to-channel crosstalk (10MHz)
- Fast slew rate: 1300V/uS
- Unity gain stable
- Improved replacement for CLC412

CONTROLLING DOCUMENTS:

LMH6715J-QML	5962-0254701MPA
LMH6715J-QMLV	5962-0254701VPA
LMH6715JFQML	5962F0254701MPA
LMH6715JFQMLV	5962F0254701VPA

Applications

- HDTV, NTSC & PAL video systems
- Video switching and distribution
- IQ amplifiers
- Wideband active filters
- Cable drivers
- DC coupled single-to-differential conversions

(Absolute Maximum Ratings)

(Note 1)

Supply Voltage (Vcc)		±6.75V
Common Mode Input Voltage (Vcm)		V+ - V-
Differential input voltage		V+ - V-
Power Dissipation (Pd)		1.0W
Lead Temperature (Soldering, 10 seconds)		+300 C
Junction Temperature (Tj)		+175 C
Storage Temperature Range		-65 C ≤ Ta ≤ +150 C
Thermal Resistance		
ThetaJA		
CERDIP	(Still Air)	140 C/W
	(500LF/Min Air Flow)	80 C/W
ThetaJC		
CERDIP		32 C/W
Package Weight (typical)		
CERDIP		TBD
ESD Tolerance (Note 3)		2000V

- Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Ratings are conditions for which the device is 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. Some performance characteristics may degrade when the device is not operated under the listed test conditions.
- Note 2: The maximum power dissipation must be derated at elevated temperatures and is dictated by Tjmax (maximum junction temperature), ThetaJA (package junction to ambient thermal resistance), and TA (ambient temperature). The maximum allowable power dissipation at any temperature is Pdmax = (Tjmax - TA) / ThetaJA or the number given in the Absolute Maximum Ratings, whichever is lower.
- Note 3: Human body model, 100pF discharged through 1.5k Ohms.

Recommended Operating Conditions

Supply Voltage (Vcc)		± 5Vdc to ±6Vdc
Ambient Operating Temperature Range (Ta)		-55 C ≤ Ta ≤ +125 C

Electrical Characteristics

DC Parameters: Static and DC tests

(The following conditions apply to all the following parameters, unless otherwise specified.)
 DC: $R_l = 100 \text{ Ohms}$, $V_{cc} = \pm 5V \text{ dc}$, $A_v = +2$, $R_f = 634 \text{ Ohms}$, $R_g = 634 \text{ Ohms}$, $-55 \text{ C} \leq T_a \leq +125 \text{ C}$

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Ibn	Input Bias Current, Noninverting		3		-12	12	μA	1
					-12	+12	μA	2
					-20	+20	μA	3
Ibi	Input Bias Current, Inverting		3		-21	+21	μA	1
					-25	+25	μA	2
					-35	+35	μA	3
Vio	Input offset voltage		3		-6	6	mV	1
					-12	12	mV	2
					-10	10	mV	3
Icc	Supply Current	$R_l = \text{infinity}$	3			14.0	mA	1
						14.0	mA	2
						16.0	mA	3
PSRR	Power Supply Rejection Ratio	$+V_s = +4.5V \text{ to } +5.0V$, $-V_s = -4.5V \text{ to } -5.0V$			46		dB	1
					44		dB	2, 3

AC Parameters: Frequency Domain Response

(The following conditions apply to all the following parameters, unless otherwise specified.)
 AC: $R_l = 100 \text{ Ohms}$, $V_{cc} = \pm 5V \text{ dc}$, $A_v = +2$, $R_f = 634 \text{ Ohms}$, $R_g = 634 \text{ Ohms}$, $-55 \text{ C} \leq T_a \leq +125 \text{ C}$

SSBW	Small signal bandwidth	-3dB bandwidth, $V_{out} < 0.5 V_{pp}$	2		175		MHz	4
GFP	Gain flatness peaking high	0.1MHz to 30 MHz, $V_{out} \leq 0.5V_{pp}$	2			0.1	dB	4
GFR	Gain flatness rolloff	0.1MHz to 30 MHz, $V_{out} \leq 0.5V_{pp}$	2			0.3	dB	4

AC Parameters: Distortion and Noise Response

(The following conditions apply to all the following parameters, unless otherwise specified.)
 AC: $R_l = 100 \text{ Ohms}$, $V_{cc} = \pm 5V \text{ dc}$, $A_v = +2$, $R_f = 634 \text{ Ohms}$, $R_g = 634 \text{ Ohms}$, $-55 \text{ C} \leq T_a \leq +125 \text{ C}$

HD2	Second harmonic distortion	2 Vpp at 20 MHz	2			-42	dBc	4
HD3	Third harmonic distortion	2 Vpp at 20 MHz	2			-46	dBc	4

Electrical Characteristics

DC Parameters: DRIFT VALUES

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

DC: "Deltas not required on B-Level product. Deltas required for S-Level product at Group B5 ONLY, or as specified on the Internal Processing Instructions (IPI).

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Ibn	Input Bias Current, Noninverting		1		-1.2	+1.2	uA	1
Ibi	Input Bias Current, Inverting		1		-2.0	+2.0	uA	1
Vio	Input Offset Voltage		1		-1.0	+1.0	mV	1
Icc	Supply Current	Rl = Infinity	1		-1.0	+1.0	mA	1

Note 1: If not tested, shall be guaranteed to the limits specified in table 1 herein.

Note 2: Group A testing only.

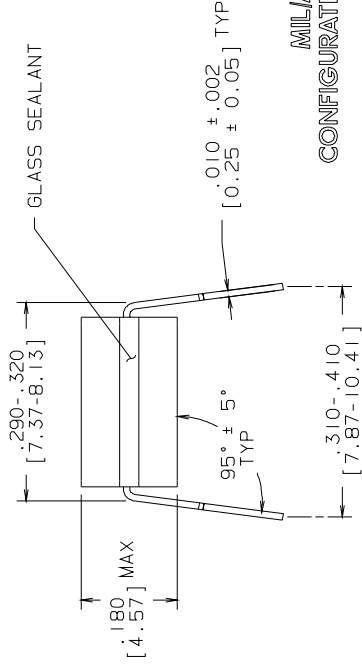
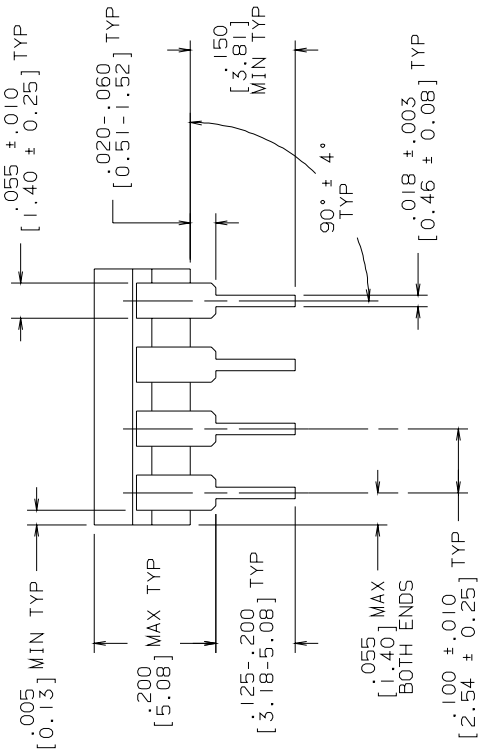
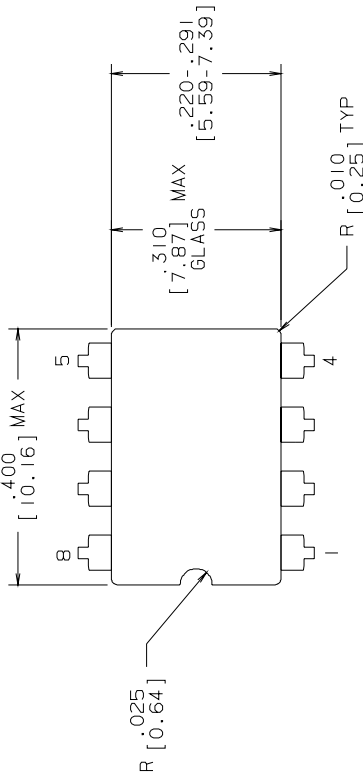
Note 3: Pre and post irradiation limits are identical to those listed under electrical characteristics. These parts may be dose rate sensitive in a space environment and demonstrate enhanced low dose rate effect. Radiation end point limits for the noted parameters are guaranteed only for the conditions as specified in MIL-STD-883, Method 1019.

Graphics and Diagrams

GRAPHICS#	DESCRIPTION
07082HRA4	CERDIP (J), 8 LEAD (B/I CKT)
J08ARL	CERDIP (J), 8 LEAD (P/P DWG)
P000482A	CERDIP (J), 8 LEAD (PIN OUT)

See attached graphics following this page.

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



MILAERO
CONFIGURATION CONTROL
MIL-M-38510
CONFIGURATION CONTROL

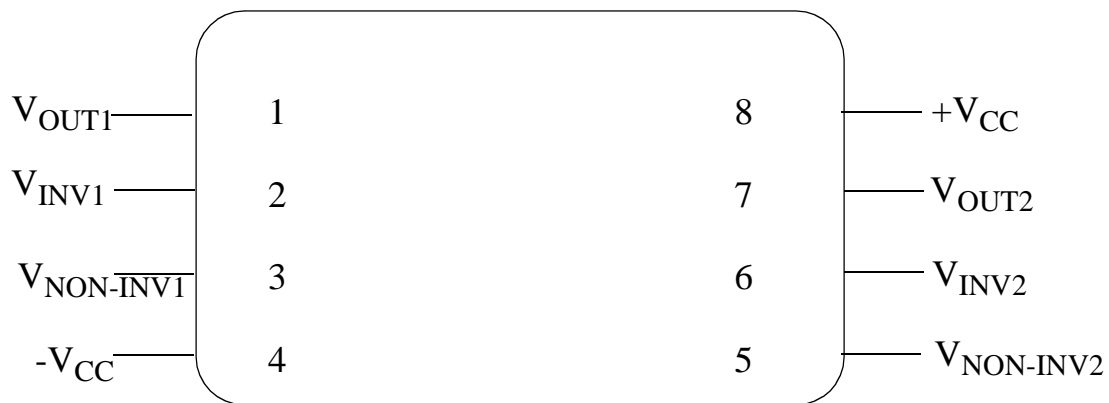
CONTROLLING DIMENSION: INCH	
APPROVALS	DATE
DRAWN T. LEQUANG	09/21/93
DFTG. CHK.	
ENGR. CHK.	
APPROVAL	
 PROJECTION INCH [MM]	
SCALE N/A	SIZE B
DRAWING NUMBER MKT-J08A	REV L
DO NOT SCALE DRAWING	SHEET 1 OF 1

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

CERDIP (J),
8 LEAD

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.



LMH6715J
8 - LEAD DIP
CONNECTION DIAGRAM
TOP VIEW
P000482A



National Semiconductor
MIL/AEROSPACE OPERATIONS
2900 SEMICONDUCTOR DRIVE
SANTA CLARA, CA 95050

Revision History

Rev	ECN #	Rel Date	Originator	Changes
0A0	M0004141	05/09/03	Rose Malone	Initial MDS Release: MNLMH6715-X-RH, Rev. 0A0