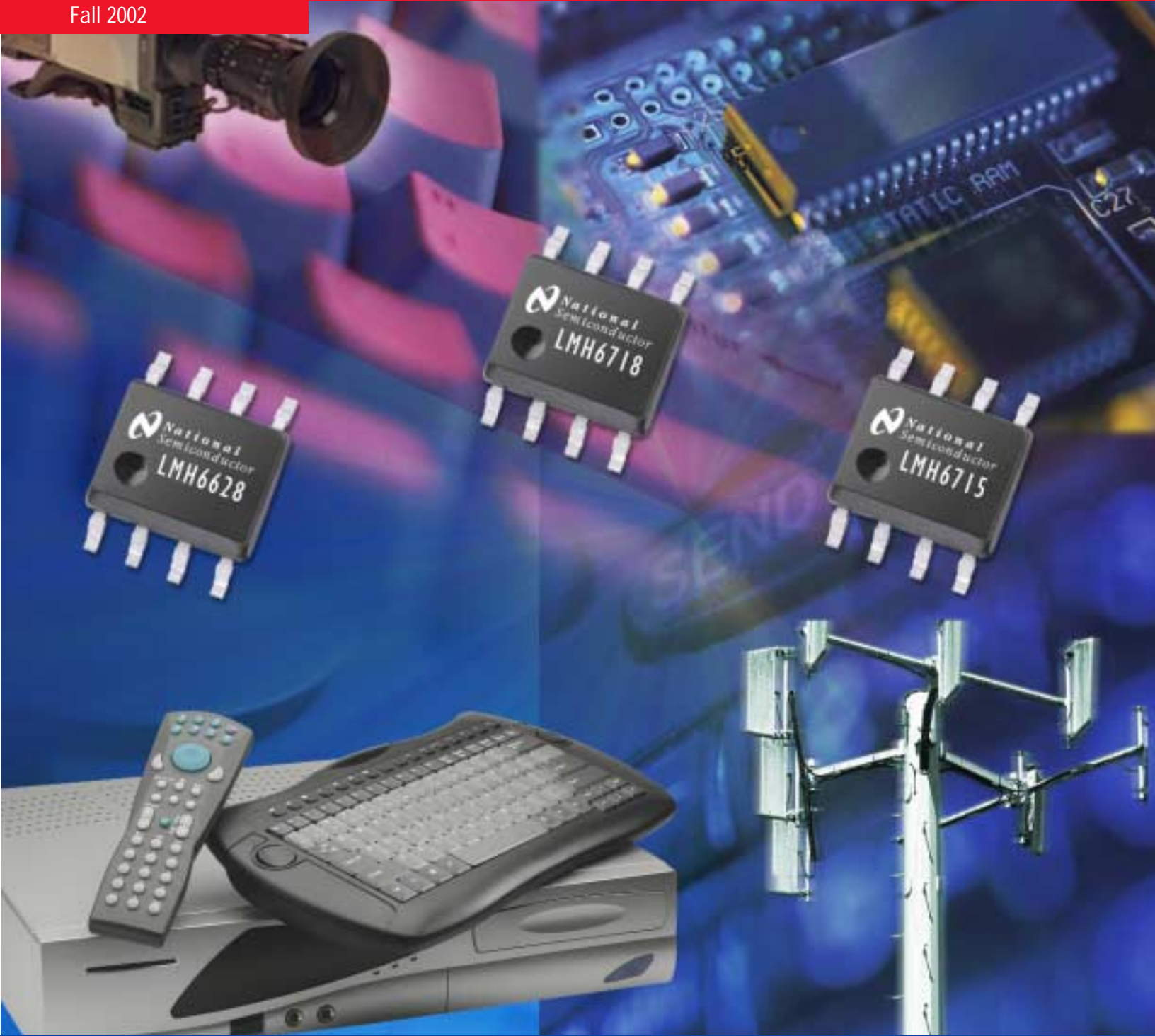


High-Speed Amplifier Products Selection Guide

Fall 2002



High-Speed Amplifier Products

Released Products

Part Number	Release Date	Package Type	Key Features	Mode	SSBW MHz	Av V/V ¹	Slew Rate V/ μ s	I _{cc} mA/ch	2nd/3rd HD into R _L = 100 Ω	NTSC Diff G/P %/deg
LMH6622	Released	Dual	Very Low Noise	VFB	160	2	85	4.3	-90/-94 at 1 MHz	0.03/0.03
LMH6628	Released	Dual	Widebandwidth, Very Low Noise	VFB	300	1	550	9	-65/-74 at 10 MHz	N/A
LMH6639	Released	Single	CMIR < 0V, Rail-to-Rail Output, Disable	VFB	190	1	172	3.6	-65 at 5 MHz	0.07/0.05
LMH6642	Released	Single	CMIR < 0V, Rail-to-Rail Output	VFB	130	1	135	2.7	-62 at 5 MHz	0.15/0.04
LMH6643	Released	Dual	CMIR < 0V, Rail-to-Rail Output	VFB	130	1	135	2.7	-62 at 5 MHz	0.15/0.04
LMH6644	Released	Quad	CMIR < 0V, Rail-to-Rail Output	VFB	120	1	125	2.7	-60 at 5 MHz	0.16/0.05
LMH6645	Released	Single	Rail-to-Rail Input/Output	VFB	55	1	22	0.65	N/A	N/A
LMH6646	Released	Dual	Rail-to-Rail Input/Output	VFB	55	1	22	0.65	N/A	N/A
LMH6647	Released	Single	Rail-to-Rail Input/Output, 10 μ A Shutdown	VFB	55	1	22	0.65	N/A	N/A
LMH6654	Released	Single	Low Noise	VFB	250	1	200	4.5	-80/-85 at 5 MHz	0.01/0.025
LMH6655	Released	Dual	Low Noise	VFB	250	1	200	4.5	-80/-85 at 5 MHz	0.01/0.025
LMH6657	Released	Single	3V Single Supply, CMIR < 0V	VFB	270	1	700	6.2	-70/-57 at 5 MHz	0.03/0.1
LMH6658	Released	Dual	3V Single Supply, CMIR < 0V	VFB	270	1	700	6.2	-70/-57 at 5 MHz	0.03/0.1
LMH6672	Released	Dual	12V, Low Distortion, Line Driver	VFB	130	2	170	6.2	-92/-95 at 1 MHz	N/A
LMH6715	Released	Dual	Wideband Video	CFB	400	2	1300	5.8	-60/-75 at 20 MHz	0.02/0.02
LMH6718	Released	Dual	Programmable Gain Buffer, , A _V = 1, +1 or +2	PGB	130	2	600	2.6	-84/-84 at 1 MHz	0.04/0.03
LM6171	Released	Single	30V, High Slew Rate	VFB	160	1	3600	2.5	-72/-70 at 1 MHz	0.03/0.5
LM6172	Released	Dual	30V, High Slew Rate	VFB	160	1	3000	2.3	-72/-70 at 1 MHz	0.28/0.6
LM6181	Released	Single	30V, General Purpose	CFB	160	2	2000	7.5	-50/-55 at 10 MHz	0.05/0.04
LM6182	Released	Dual	30V, General Purpose	CFB	100	2	2000	7.5	-50/-55 at 10 MHz	0.05/0.04
LM7121	Released	Single	30V, General Purpose SOT23	VFB	235	1	1300	5	N/A	0.3/0.65
LM7171	Released	Single	30V, Very High Slew Rate, A _V = +2 (min)	VFB	220	2	4100	6.5	-75/-55 at 5 MHz	0.01/0.02
LM7372	Released	Dual	30V, Low Distortion, Line Driver	VFB	120	1	3000	6.5	-80/-91 at 1 MHz	0.01/0.02

Preliminary Product Specifications

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Bold items in tables denote Target Specs

LMH6559	2/2003	Single	Closed Loop Buffer	BUF	800	1	3500	8	-62/-62 at 20 MHz	0.15/0.04
LMH6565	5/2003	Single	Fast Settling, Output Clamping	CFB	150	2	800	17	-50/-60 at 20 MHz	0.01/0.05
LMH6560	2/2003	Quad	Closed Loop Buffer	BUF	800	1	3500	8	-50/-58 at 20 MHz	0.08/0.1
LMH6609	5/2003	Single	Very High-Speed VFB	VFB	750	1	1500	7	-64/-70 at 5 MHz	0.015/0.025
LMH6624	11/2002	Single	Very Low Noise	VFB	95	20	350	1	-53/-75 at 10 MHz	0.014/0.01
LMH6682	11/2002	Dual	CMIR < 0V, A _V \geq 2 (min.)	VFB	175	2	800	5.5	-58 at 5 MHz	0.02/0.02
LMH6683	11/2002	Triple	CMIR < 0V, A _V \geq 2 (min.)	VFB	175	2	800	5.5	-58 at 5 MHz	0.02/0.02
LMH6702	3/2003	Single	Very Low Distortion, Widebandwidth	CFB	350	2	1200	13.5	-49/-59 at 60 MHz	0.03/0.01
LMH6705	2/2003	Single	Ultra Wideband	CFB	1100	2	2500	3	-44/-62 at 50 MHz	0.03/0.02
LMH6714	11/2002	Single	Widebandwidth, Video	CFB	250	2	1500	5	-46/-50 at 20 MHz	0.02/0.02
LMH6720	11/2002	Single	Widebandwidth, Video, Disable	CFB	250	2	1300	5	-72/-70 at 1 MHz	0.01/0.02
LMH6722	11/2002	Quad	Widebandwidth, Video	CFB	250	2	1300	5	-44/-54 at 20 MHz	0.03/0.03
LMH6723	2/2003	Single	Low-Power, High Output	CFB	135	2	370	1	-86/-65 at 1 MHz	0.03/0.3
LMH6724	2/2003	Dual	Low-Power, High Output	CFB	135	2	300	1	-86/-85 at 1 MHz	0.06/0.02
LMH6725	2/2003	Quad	Low-Power, High Output	CFB	148	2	370	1	-78/-94 at 1 MHz	0.06/0.06
LMH6732	11/2002	Single	Programmable Supply Current	CFB	850	2	1500	9	-70/-75 at 10 MHz	0.02/0.02

High-Speed Amplifier Products

Released Products

Part Number	I_{OUT} mA (Typ)	Settling Time (2V step) ns to %	V_{OS} Typ/Temp mV	Spec. Supply Range (V) ²	Noise Voltage (nV \sqrt{Hz})	i_{nn} (pA \sqrt{Hz})	i_{ni} (pA \sqrt{Hz})	Temp Range	Package	Blank Eval Board	SPICE Model	Price ³
LMH6622	90	40 to 0.1	0.2	5 to ± 6	1.6	1.5	1.5	I	MA, MM	B, V	Y	\$1.85
LMH6628	85	12 to 0.1	0.5/2.6	± 5	2	2	2	I	MA, MM	B, V	Y	\$1.98
LMH6639	110	33 to 0.1	1/7	3 to ± 5	17	1.4	1.4	I	MA, MF	A, P	Y	\$1.09
LMH6642	75	68 to 0.1	1/7	3 to ± 5	17	0.9	0.9	I	MA, MF	A, L	Y	\$0.75
LMH6643	75	68 to 0.1	1/7	3 to ± 5	17	0.9	0.9	I	MA, MM	B, V	Y	\$0.90
LMH6644	70	68 to 0.1	1/7	3 to ± 5	17	0.9	0.9	I	MA, MT	E, G	Y	\$1.48
LMH6645	20	160 to 0.1	1/4	2.7 to ± 5	17	0.75	0.75	I	MA, MF	A, L	Y	\$1.25
LMH6646	20	160 to 0.1	1/4	2.7 to ± 5	17	0.75	0.75	I	MA, MM	B, V	Y	\$1.99
LMH6647	20	160 to 0.1	1/4	2.7 to ± 5	17	0.75	0.75	I	MA, MF	A, P	Y	\$1.35
LMH6654	75	20 to 0.1	1/4	5, ± 5	4.5	1.7	1.7	I	MA, MF	A, L	Y	\$0.79
LMH6655	75	20 to 0.1	1/4	5, ± 5	4.5	1.7	1.7	I	MA, MM	B, V	Y	\$1.05
LMH6657	85	35 to 0.1	1.1/7	3 to ± 5	11	2.1	2.1	I	MA, MF	A, L	Y	\$0.88
LMH6658	85	35 to 0.1	1.1/7	3 to ± 5	11	2.1	2.1	I	MA, MM	B, V	Y	\$1.25
LMH6672	200	N/A	2.2/4	5, ± 6	4.5	1.7	1.7	I	MA, MR, LD	A, X	Y	\$1.98
LMH6715	70	12 to 0.05	2/8	± 5	3.4	1.4	10	I	MA, MM	B, V	Y	\$1.69
LMH6718	200	17 to 0.05	0.2/15	+5 to ± 5	8	9	12	I	MA, MM	B, V	Y	\$1.88
LM6171	100	48 to 0.1	1.5/5	± 5 to ± 15	12	1	1	I	M, N	A	Y	\$1.29
LM6172	100	65 to 0.1	0.4/4	± 5 to ± 15	12	1	1	I, M	M, N	B	Y	\$1.60
LM6181	100	50 to 0.1	2/4	± 5 to ± 15	4	3	16	I	M, N	A	Y	\$1.49
LM6182	100	50 to 0.1	2/4	± 5 to ± 15	4	3	16	I	M, N	B	N	\$2.49
LM7121	40	74 to 0.1	0.9/15	+5 to ± 15	17	1.9	1.9	C	M, N, M5	A, L	Y	\$0.99
LM7171	100	42 to 0.1	0.2/4	± 5.5 to ± 15	14	1.8	1.8	I, M	M, N	A	Y	\$1.29
LM7372	150	50 to 0.1	2.2/8	$\pm 5, \pm 15$	14	1.5	1.5	I	MA, MR, LD	A, X	N	\$1.98

Preliminary Product Specifications

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Bold items in tables denote Target Specs

LMH6559	60	16 to 0.1	2/17	± 3 to 13	4	1.6	—	I	MA, MF	C, J	Y	TBD
LMH6565	55	25 to 0.0025	0.5/2.8	± 5	2	18	22	I	MA, MM	A, F	Y	TBD
LMH6560	25	20 to 0.01	0.5/8.2	± 5	3.9	0.9	—	I	MF, MT	D, K	Y	TBD
LMH6609	90	10 to 0.05	1/4	± 2.5 to ± 6	3.5	2.5	2.5	I	MA, MF	A, L	Y	TBD
LMH6624	90	22 to 0.2	0.1/1	± 5	1.05	1.6	1.6	I	MA, MF	A, L	Y	TBD
LMH6682	150	33 to 0.1	1/TBD	3 to ± 5	10	2	2	I	MA, MM	B, V	Y	TBD
LMH6683	150	33 to 0.1	1/TBD	3 to ± 5	10	2	2	I	MA, MT	E, G	Y	TBD
LMH6702	70	8 to 0.1	0.5/9.5	± 5	2.2	3.2	14.3	I	MA, MF	A, L	Y	TBD
LMH6705	90	11 to 0.1	3/9	± 5	2.2	3	15	I	MA, MF	H, L	Y	TBD
LMH6714	70	12 to 0.05	2/12	± 5	2.7	2.1	11	I	MA, MF	A, L	Y	TBD
LMH6720	60	18 to 0.05	1/8	± 5	5.0	3	12	I	MA, MF	A, L	Y	TBD
LMH6722	70	12 to 0.1	2/10	± 5	3	2	11.5	I	MA, MT	E, G	Y	TBD
LMH6723	85	15 to 0.05	2/8	+5 to ± 5	3	6.9	8.5	I	MA, MF	A, L	Y	TBD
LMH6724	85	15 to 0.05	2/8	+5 to ± 5	3.4	6.3	8.7	I	MA, MM	B, V	Y	TBD
LMH6725	85	18 to 0.05	1/8	+5 to ± 5	4.9	6.6	11.1	I	MA, MT	E, G	Y	TBD
LMH6732	100	TBD	2/TBD	± 5	TBD	TBD	TBD	I	MA, MF	A, P	Y	TBD

High-Speed Amplifier Products

Variable Gain Amplifier Products

Bold items in tables denote **Target Specs**

Device	Single/Dual/Trip/Quad	Signal Channel BW	Control Channel BW	Gain Adjust Range (dB)	Slew Rate SR (V/ μ S)	Supply Voltage V_S (V)	Supply Current I_S (mA)	Common Mode Input Range CMIR (V)	Temp Range	Pkg	Eval Board	SPICE Model	Comments	Price ³	Release Date
LMH6502 ⁴	S	160 MHz	100 MHz	40	2000	± 5	28	± 2.2	I	MA, MT	R, M	Y	Gain Linear in dB	TBD	8/2003
LMH6503 ⁴	S	165 MHz	165 MHz	40	2000	± 5	46	± 2.2	I	MA, MT	R, M	Y	Linear Gain Control (V/V)	TBD	8/2003
LMH6504 ⁴	S	250 MHz	95 MHz	80	1800	± 5	13.5	± 3.8	I	MA, MM	N, S	Y	Gain Linear in dB	TBD	8/2003

Multiplexer Products

Bold items in tables denote **Target Specs**

Device	Channels	Switching Speed (ns)	Crosstalk Rejection (dB) ⁵	Settling Time to 0.01 (ns)	2nd Harmonic Distortion ⁶ HD2 (dBc)	3rd Harmonic Distortion ⁶ HD3 (dBc)	SSBW (MHz)	Supply Voltage V_S (V)	Supply Current I_S (mA)	Digital Interface	Temp Range	Pkg	Eval Board	SPICE Model	Price ³	Release Date
LMH6570	2:1	5	80	17	80	86	600	± 5	12	CMOS	I	MA, MT	TBD	Y	TBD	8/2003
LMH6571	4:1	6	80	17	80	86	600	± 5	16	CMOS	I	MA, MT	TBD	N	TBD	8/2003
LMH6572	3 x 2:1	6	80	12	80	86	1000	± 5	10	CMOS	I	MA, MT	TBD	Y	TBD	5/2003

Footnotes

- Closed Loop Gain used to specify most parameters.
- Spec. Supply Range is the range of total supply voltage where operation is possible but parameters are not necessarily guaranteed. Refer to datasheets for more details.
- 1,000 pc. suggested resale, FOB Santa Clara, California, USA. Price may vary by package or grade.
- $A_{VMAX} = 10$
- Crosstalk tested @ 10 MHz $2 V_{PP}$
- Harmonic distortion @ 5 MHz $2 V_{PP}$

Temperature Range Code

C = Commercial (0°C to +70°C)
 I = Industrial (-40°C to +85°C)
 M = Military (-55°C to +125°C)
 All values are typical at room temperature, unless otherwise specified.

Mode

CFB = Current Feedback
 BUF = Closed Loop Buffer
 PGB = Programmable Gain Buffer
 VFB = Voltage Feedback

Package Codes

MA, M = Plastic SOIC
 N = Plastic SOIC
 MF, M5 = SOT-23
 MM = MSOP
 MT = Plastic TSSOP
 LD = LLP (Leadless Leadframe)
 MR = PSOP

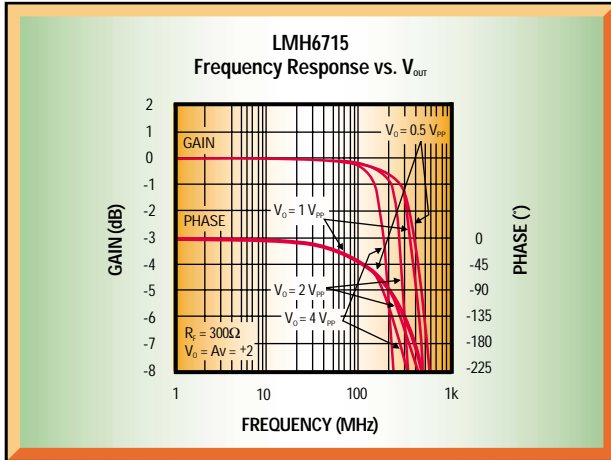
Eval Board*

DIP	SOIC
A = CLC730013	CLC730027
B = CLC730038	CLC730036
C =	CLC730045
D =	CLC730023 (Rev S)
E =	CLC730031
F = CLC730077 (MSOP-8 Single)	
G =	CLC730131
H =	CLC730060
J = CLC730168 (SOT23-5 Buffer)	
K = CLC730132 (TSSOP-14 Buffer)	
L = CLC730068 (SOT23-5)	
M =	CLC730125A
N =	CLC730066
P = CLC730116 (SOT23-6)	
R =	CLC730033
S = CLC730166 (MSOP-8 VGA)	
V = CLC730123 (MSOP-8 Dual)	
X = CLC730121 (EPAD-8)	

* Eval Boards accompany sample requests and cannot be ordered separately.

New Products

LMH6715 Dual Wideband Video Op Amp



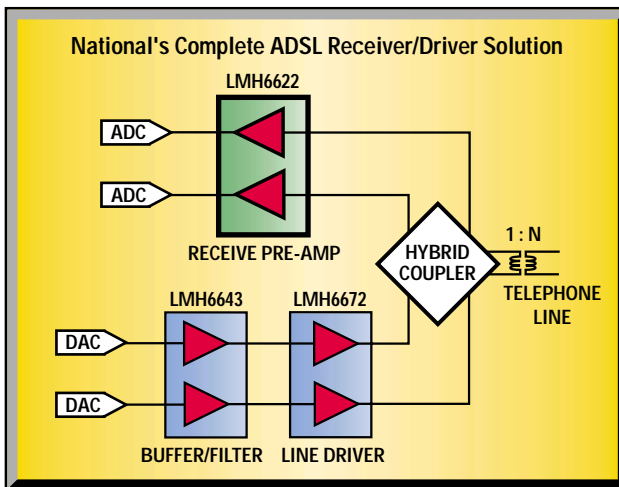
■ Features

- Very low diff. gain, phase: 0.02%, 0.02°
- Wide bandwidth: 480 MHz ($A_v = +1V/V$); 400 MHz ($A_v = +2V/V$)
- 0.1 dB gain flatness to 100 MHz
- Low power: 5.8 mA/channel
- -70 dB channel-to-channel crosstalk (10 MHz)
- Fast slew rate: 1300V/ μ s
- Unity gain stable
- Improved replacement for CLC412
- Available in an SOIC-8 package

■ Applications

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

LMH6622 Dual, Low Noise, Amplifier



■ Features

- Voltage noise: 1.6 $V/\sqrt{\text{Hz}}$ @100 kHz
- Bandwidth 160 MHz ($A_v = +2$)
- Wide supply range: 5V to 12V
- Low supply current: 4.3 mA/Amp
- MTPR (ADSL): -78 dBc upstream; -70 dBc downstream
- 2nd/3rd HD: -90/-94 dBc @1 MHz
- 2 V_{pp} : 100 Ω
- Available in an SOIC-8 and MSOP-8 package

■ Applications

- xDSL receivers
- Low noise instrumentation front end
- Ultrasound preamps
- Active filters
- Cellphone basestations

National's New 3-Chipset ADSL Solution

Part #	Description	Price @ 1K
LMH6622	1.6 $nV/\sqrt{\text{Hz}}$ Low-Receiver Pre-amp	\$1.85
LMH6672	93 dBc SFDR Low-Distortion Line Driver	\$1.98
LMH6643	Low-Cost Buffer/Filter Amplifier	\$0.90

Our LMH™ Op Amps are Based on the VIP10™ Process

Developed in National's wafer fabrication site in Arlington, Texas, VIP10™ is a high-speed, dielectrically-isolated, complimentary bipolar IC process that utilizes deep trench technology on a bonded wafer for complete dielectric isolation and optimal high-speed amplifier performance. Trench technology with bonded wafers helps minimize parasitic capacitance for optimal power-to-bandwidth performance, lower distortion and decreased die size. VIP10 is the process technology that allows National to design the most power-efficient, performance-oriented high-speed amplifiers on the market today.

National Semiconductor provides a comprehensive set of support services. Product information, including sales literature and technical assistance, is available through National's Customer Support Centers.

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Molded Small Outline Package
(SOT-23)



Thin Shrink Small Outline Package
(TSSOP)



Leadless Leadframe Package
(LLP)



Ceramic Small Outline Integrated Circuit
(SOIC)