

Amplifier Products

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4Q 2006

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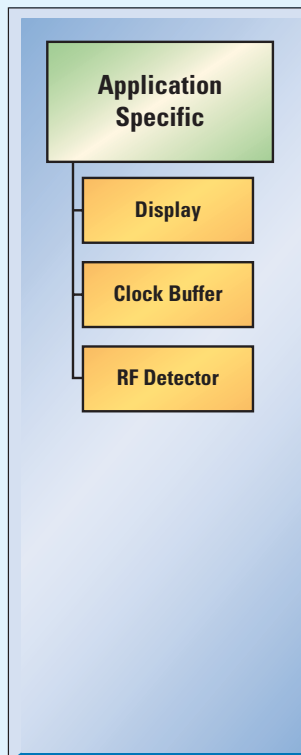
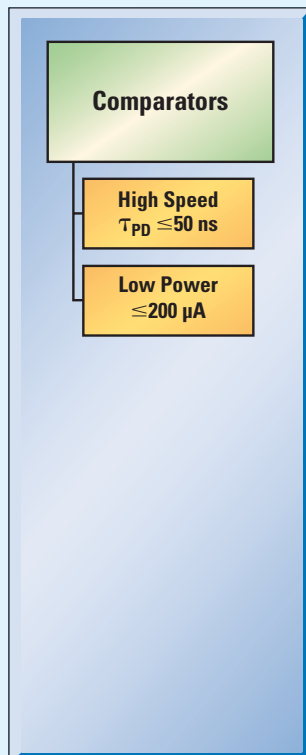
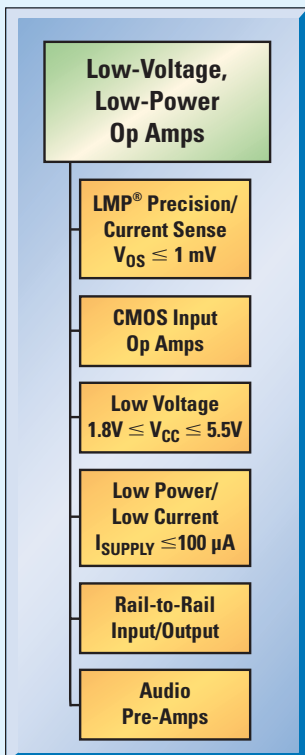
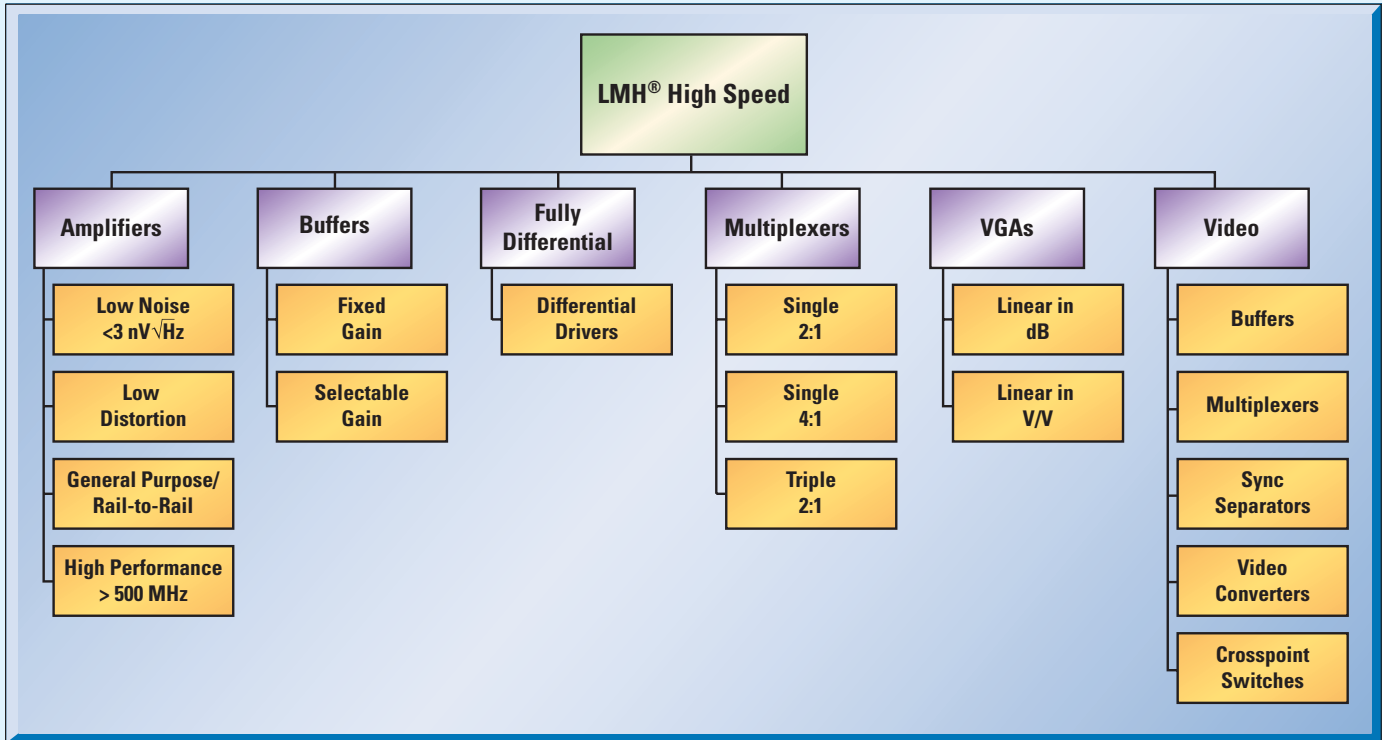
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 **National
Semiconductor**
The Sight & Sound of Information

National's Amplifier Product Portfolio



Abbreviations

Com = Commercial (0°C to 70°C)
 Ext = Extended Temperature (-40°C to 125°C typ)*
 Ind = Industrial (-40°C to 85°C)
 Mil = Military (-55°C to 125°C)

All values are typical at room temperature, unless otherwise specified

*See product datasheets for details

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High-Speed Amplifiers

Product ID	Package Type	Key Features	SSBW (MHz)	A_V (V/V) ¹	Slew Rate (V/ μ s)	I_{CC} (mA/ch)	Specified Supply Range (V) ²	2nd/3rd HD into $R_L = 100\Omega$	
Low-Noise Amplifiers									
LMH6624 [†]	Single	Ultra-low noise, wideband	1.5 GHz/95	1/20	350	12	± 2.5 to ± 6	-63/-80 at 10 MHz	
LMH6626	Dual	Ultra-low noise, wideband	1.3 GHz/85	1/20	320	12	± 2.5 to ± 6	-63/-80 at 10 MHz	
LMH6628 [†]	Dual	Wide bandwidth, very low noise	300	1	550	9	± 2.5 to ± 6	-65/-74 at 10 MHz	
LMH6622	Dual	Very low noise	160	2	85	4.3	± 2.25 to ± 6	-90/-94 at 1 MHz	
Low-Distortion Amplifiers									
LMH6702 [†]	Single	1.7 GHz, ultra-low distortion, wide bandwidth	1.7 GHz	2	3100	12.5	± 5 to ± 6	-63/-70 at 60 MHz	
NEW LMH6703	Single	1.2 GHz, low-distortion op amp with shutdown	1.2 GHz	2	4500	11	± 5 to ± 6	-69/-90 at 20 MHz	
NEW LMH6738	Triple	750 MHz, shutdown, 90 mA high-output current	750	1	3300	11	8 to 12	-80/-90 at 5 MHz	
NEW LMH6739	Triple	750 MHz, selectable gain buffer, $A_V = -1, +1, \text{ or } +2$	750	1	3300	10.7	8 to 12	-80/-90 at 5 MHz	
NEW LMH6550	Single	Fully-differential amplifier with disable	400	1	3000	20	4.5 to 12	-92/-103 at 5 MHz	
NEW LMH6551	Single	Fully-differential amplifier	370	1	2400	12.5	3 to 12	-94/-96 at 5 MHz	
LM7372	Dual	30V, low-distortion, line driver	220	2	3000	6.5	$\pm 5, \pm 15$	-80/-91 at 1 MHz	
LMH6622	Dual	Very low noise	160	2	85	4.3	± 2.25 to ± 6	-90/-94 at 1 MHz	
LMH6672	Dual	12V, low-distortion, line driver	130	2	170	6.2	$\pm 2.5, 5$ to ± 6	-92/-95 at 1 MHz	
LMH6678	Dual	Low-power, 2-channel, xDSL line driver	50	5.4	700	Prog.	12V, $V_{DD} = 3.3V$	-91/-57 at 1 MHz, 31Ω	

Product ID	Package Type	Key Features	Signal Channel BW (MHz)	Slew Rate (V/ μ s)	Control Channel BW (MHz)
Variable Gain Amplifiers (VGAs)					
LMH6505 ³	Single	Linear in dB, replacement for CLC5523	150	1500	150
LMH6503 ³	Single	Linear in V/V, replacement for CLC522	135	1800	100
LMH6502 ³	Single	Linear in dB, replacement for CLC520	130	1800	100

See footnotes for all High-Speed Amplifier tables on page 10

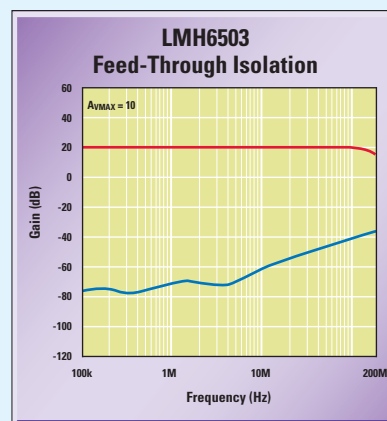
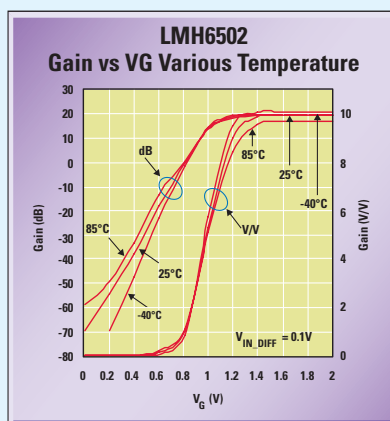
LMH6502/03/05 – Variable Gain Amplifiers Feature >70 dB Gain Range

Features

- Linear-in-dB (LMH6502)
- Linear-in-V/V (LMH6503)
- 11 mA supply current (LMH6505)

Key Applications

- Test and measurement
- Communications
- Video
- Medical imaging



NTSC Diff. G/P %/Deg.	Typ I _{OUT} (mA)	Settling Time (2V step) ns to %	V _{OS} Typ/Temp (mV)	Voltage Noise (nV/√Hz)	Current Noise i _{nn} (pA/√Hz)	Current Noise i _{ni} (pA/√Hz)	Temp Range	SPICE Model	Blank Eval Board**	Packaging
—	100	18 to 0.1	0.1/0.7	0.92	2.3	2.3	Ext	✓	A	SOT23-5, SOIC-8
—	80	18 to 0.1	0.1/0.7	1.0	1.8	2.3	Ext	✓	B	SOIC-8, MSOP-8
—	85	12 to 0.1	0.5/2	2	2	2	Ind	✓	B	SOIC-8
0.03/0.03	90	40 to 0.1	0.2	1.6	1.5	1.5	Ind	✓	B	SOIC-8, MSOP-8
0.024/0.02	80	13.4 to 0.1	1/6	1.83	3	18.5	Ind	✓	A	SOIC-8, SOT23-5
0.01/0.02	90	10 to 0.1	1.5/9	2.3	3	18.5	Ind	✓	A	SOIC-8, SOT23-6
0.02/0.01	90	10 to 0.1	0.5/4.5	2.3	3	12	Ind	✓	M	SSOP-16
0.02/0.01	90	10 to 0.1	0.5/4.5	2.3	3	12	Ind	✓	M	SSOP-16
—	±75	8 to 0.1	0.5	6	1.5	—	Ind	✓	N	SOIC-8, MSOP-8
—	±65	18 to 0.05	0.5	6	1.5	—	Ext	✓	N	SOIC-8, MSOP-8
0.01/0.02	150	50 to 0.1	2.2/8	14	1.5	1.5	Ind	—	H	LLP-8, SOIC-16, PSOP-8
0.03/0.03	90	40 to 0.1	0.2	1.6	1.5	1.5	Ind	✓	B	SOIC-8, MSOP-8
—	200	—	0.2/4	4.5	1.7	1.7	Ind	✓	B, H	SOIC-8, PSOP-8
—	580	—	—	—	—	—	Ind	✓	Call	LLP-24

Gain Adjust Range (dB)	Supply Voltage (V)	I _{CC} (mA/ch)	Common-Mode Inputs Range CMIR (V)	Temp Range	SPICE Model	Blank Eval Board**	Packaging
80	±5	11	±3.2	Ind	✓	G	SOIC-8, MSOP-8
70	±5	37	±2.2	Ind	✓	F	SOIC-14, TSSOP-14
70	±5	27	±2.2	Ind	✓	F	SOIC-14, TSSOP-14

LMH6550/51 – Improve Signal Path Dynamic Performance with Differential Drivers

LMH6550 Features

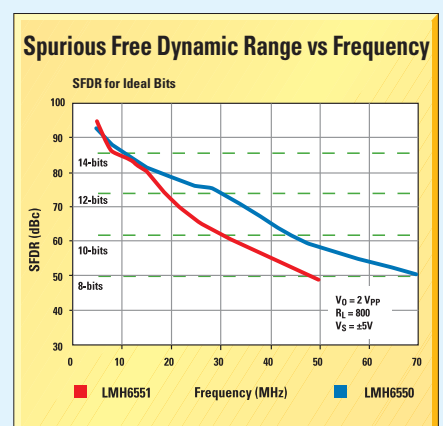
- 400 MHz, -3 dB bandwidth
- 90 MHz, 0.1 dB bandwidth
- -92/-103 dBc HD2/HD3 at 5 MHz
- 3000 V/μs slew rate
- -68 dB balance error (V_{OUT} = 1.0 V_{P-P}, 10 MHz)
- 10 ns shutdown/enable

Key Applications

- Basestations
- Industrial
- Video
- Medical equipment
- Test and measurement

LMH6551 Features

- 370 MHz, -3 dB bandwidth
- 50 MHz, 0.1 dB bandwidth
- -94/-96 dB HD2/HD3 at 5 MHz
- 2400 V/μs slew rate
- -70 dB balance error (V_{OUT} = 0.5 V_{P-P}, 10 MHz)



High-Speed Amplifiers (cont.)

Product ID	Package Type	Key Features	SSBW (MHz)	A_V (V/V) ¹	Slew Rate (V/ μ s)	I_{CC} (mA/ch)	Specified Supply Range (V) ²	2nd/3rd HD into $R_L = 100\Omega$
Low Supply Voltage Amplifiers								
LMH6551	Single	Fully differential amplifier	370	1	2400	12.5	3 to 12	-94/-96 at 5 MHz
LMH6657	Single	270 MHz single supply, CMIR <0V	270	1	700	6.5	3 to 12	-70/-57 at 5 MHz
LMH6658	Dual	270 MHz single supply, CMIR <0V	270	1	700	6.5	3 to 12	-70/-57 at 5 MHz
NEW LMH6601	Single	250 MHz, 2.4V CMOS op amp with shutdown	250	1	275	9.6	2.4 to 5.5	-56/-73 at 10 MHz
LMH6639	Single	220 MHz rail-to-rail output with disable	228	1	200	4.18	3 to \pm 6	-71 at 5 MHz (THD)
LMH6682	Dual	190 MHz, CMIR <0V, low differential gain/phase	190	2	940	6.5	3 to 12	-66/-54 at 5 MHz
LMH6642	Single	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)
LMH6643	Dual	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)
LMH6644	Quad	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)
LMH6645	Single	Rail-to-rail input/output, low power	55	1	22	0.73	2.5 to 12	—
LMH6646	Dual	Rail-to-rail input/output, low power	55	1	22	0.73	2.5 to 12	—
LMH6647	Single	Rail-to-rail input/output, low power, 10 μ A shutdown	55	1	22	0.73	2.5 to 12	—
General-Purpose Amplifiers								
LMH6714†	Single	Wideband, 400 MHz, high slew rate, low DG/DP	400	2	1800	5.6	\pm 5 to \pm 6	-58/-70 at 20 MHz
LMH6715†	Dual	Wideband, 400 MHz, high slew rate, low DG/DP	400	2	1300	5.8	\pm 5 to \pm 6	-60/-75 at 20 MHz
LMH6720†	Single	Wideband, 400 MHz, high slew rate, disable	400	2	1800	5.6	\pm 5 to \pm 6	-58/-70 at 20 MHz
LMH6722†	Quad	Wideband, 400 MHz, high slew rate, low DG/DP	400	2	1800	5.6	\pm 5 to \pm 6	-58/-70 at 20 MHz
LMH6657	Single	270 MHz single supply, CMIR <0V	270	1	700	6.5	3 to 12	-70/-57 at 5 MHz
LMH6658	Dual	270 MHz single supply, CMIR <0V	270	1	700	6.5	3 to 12	-70/-57 at 5 MHz
LMH6654	Single	Low noise, 250 MHz, low power	250	1	200	4.5	\pm 2.5 to \pm 6	-80/-85 at 5 MHz
LMH6655	Dual	Low noise, 250 MHz, low power	250	1	200	4.5	\pm 2.5 to \pm 6	-80/-85 at 5 MHz
NEW LMH6601	Single	250 MHz, 2.4V CMOS op-amp with shutdown	250	1	275	9.6	2.4 to 5.5V	-56/-73 at 10 MHz
LMH6642	Single	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)
LMH6643	Dual	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)
LMH6644	Quad	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)
LMH6645	Single	Rail-to-rail input/output, low power	55	1	22	0.73	2.5 to 12	—
LMH6646	Dual	Rail-to-rail input/output, low power	55	1	22	0.73	2.5 to 12	—
LMH6647	Single	Rail-to-rail input/output, low power, 10 μ A shutdown	55	1	22	0.73	2.5 to 12	—

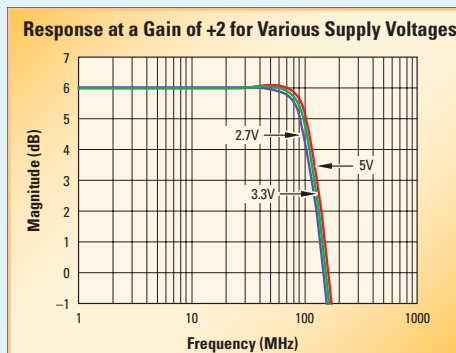
See footnotes for all High-Speed Amplifier tables on page 10

LMH6601 – 250 MHz, 2.4V CMOS Op Amp with Shutdown

Features

$V_S = 3.3V$, $T_A = 25^\circ C$, $A_V = 2 V/V$, $R_L = 150\Omega$ to V^-

- 125 MHz, -3 dB small signal bandwidth
- 75 MHz, -3 dB large signal bandwidth
- 30 MHz, large signal, 0.1 dB gain flatness
- 260 V/ μ s slew rate
- 0.25%/0.25° differential gain/differential phase
- Rail-to-rail output
- 2.4V to 5.5V single supply operating range
- SC70-6 packaging



NTSC Diff. G/P %/Deg.	Typ I _{OUT} (mA)	Settling Time (2V step) ns to %	V _{OS} Typ/Temp (mV)	Voltage Noise (nV/√Hz)	Current Noise i _{nn} (pA/√Hz)	Current Noise i _{ni} (pA/√Hz)	Temp Range	SPICE Model	Blank Eval Board**	Packaging
—	±65	18 to 0.05	0.5	6	1.5	—	Ext	✓	N	SOIC-8, MSOP-8
0.03/0.1	110	35 to 0.1	1/7	11	2.1	2.1	Ind	✓	A	SC70-5, SOT23-5
0.03/0.1	110	35 to 0.1	1/7	11	2.1	2.1	Ind	✓	B	SOIC-8, MSOP-8
0.25/0.25	150	50 to 0.1	1/5	7	0.05	0.05	Ind	✓	T	SC70-6
0.11/0.053	112	33 to 0.1	1/7	16	1.14	1.14	Ind	✓	A	SOIC-8, SOT23-6
0.01/0.08	85	42 to 0.1	1/7	12	3	3	Ind	✓	B	SOIC-8, MSOP-8
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	A	SOIC-8, SOT23-5
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	B	SOIC-8, MSOP-8
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	C	SOIC-14, TSSOP-14
—	20	—	1/4	17	0.75	0.75	Ind	✓	A	SOIC-8, SOT23-5
—	20	—	1/4	17	0.75	0.75	Ind	✓	B	SOIC-8, MSOP-8
—	20	—	1/4	17	0.75	0.75	Ind	✓	A	SOIC-8, SOT23-6
0.01/0.01	70	12 to 0.05	0.2/8	3.4	1.2	10	Ind	✓	A	SOIC-8, SOT23-5
0.02/0.02	70	12 to 0.05	2/8	3.4	1.4	10	Ind	✓	B	SOIC-8
0.02/0.01	70	12 to 0.05	0.2/8	3.4	1.2	10	Ind	✓	A	SOIC-8, SOT23-6
0.01/0.01	70	12 to 0.05	0.2/8	3.4	1.2	6	Ind	✓	C	SOIC-14
0.03/0.1	110	35 to 0.1	1/7	11	2.1	2.1	Ind	✓	A	SC70-5, SOT23-5
0.03/0.1	110	35 to 0.1	1/7	11	2.1	2.1	Ind	✓	B	SOIC-8, MSOP-8
0.01/0.025	80	25 to 0.1	1/4	4.5	1.7	1.7	Ind	✓	A	SOT23-5, SOIC-8
0.01/0.025	80	25 to 0.1	1/4	4.5	1.7	1.7	Ind	✓	B	MSOP-8, SOIC-8
0.25/0.25	150	50 to 0.1	1/5	7	0.05	0.05	Ind	✓	T	SC70-6
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	A	SOIC-8, SOT23-5
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	B	SOIC-8, MSOP-8
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	C	SOIC-14, TSSOP-14
—	20	—	1/4	17	0.75	0.75	Ind	✓	A	SOIC-8, SOT23-5
—	20	—	1/4	17	0.75	0.75	Ind	✓	B	SOIC-8, MSOP-8
—	20	—	1/4	17	0.75	0.75	Ind	✓	A	SOIC-8, SOT23-6

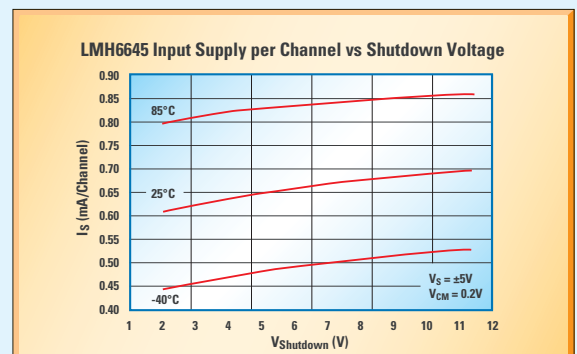
LMH6645/46/47 – High-Speed, Low-Voltage Amplifiers with Shutdown

Features

- Supply current 650 μ A/channel
- Output short circuit current 42 mA
- Linear output current \pm 20 mA
- Input common-mode voltage 0.3V beyond rails

Key Applications

- Active filters
- High-speed portable devices
- Multiplexing applications (LMH6647)
- Current sense buffer
- High-speed transducer amplifier



High-Speed Amplifiers (cont.)

Product ID	Package Type	Key Features	SSBW (MHz)	A_V (V/V) ¹	Slew Rate (V/ μ s)	I_{CC} (mA/ch)	Specified Supply Range (V) ²	2nd/3rd HD into $R_L = 100\Omega$	
Rail-to-Rail Amplifiers									
LMH6601	Single	250 MHz, 2.4V CMOS op amp with shutdown	250	1	275	9.6	2.4 to 5.5	-56/-73 at 10 MHz	
LMH6639	Single	220 MHz, rail-to-rail output with disable	228	1	200	4.18	3 to ± 6	-71 at 5 MHz (THD)	
LMH6642	Single	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)	
LMH6643	Dual	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)	
LMH6644	Quad	130 MHz, 75 mA rail-to-rail output	130	1	135	2.7	2.7 to 12.8	-62 at 5 MHz (THD)	
LMH6645	Single	Rail-to-rail input/output, low power	55	1	22	0.73	2.5 to 12	—	
LMH6646	Dual	Rail-to-rail input/output, low power	55	1	22	0.73	2.5 to 12	—	
LMH6647	Single	Rail-to-rail input/output, low power, 10 μ A shutdown	55	1	22	0.73	2.5 to 12	—	
High Supply Voltage Amplifiers									
LM7121	Single	30V, general purpose, SOT-23	235	1	1300	5.3	5 to ± 15	—	
LM7171 [†]	Single	30V, very high slew rate, $A_V = +2$ (min)	220	2	4100	6.5	± 5.5 to ± 15	-75/-55 at 5 MHz	
LM7372	Dual	30V, low-distortion line driver	220	2	3000	6.5	± 5 , ± 15	-80/-91 at 1 MHz	
LM6171	Single	30V, high slew rate	160	1	3600	4	± 5 to ± 15	-72/-70 at 1 MHz	
LM6172 [†]	Dual	30V, high slew rate	160	1	3000	2.3	± 5 to ± 15	-72/-70 at 1 MHz	
LM6181	Single	30V, general purpose	100	2	1400	7.5	± 5 to ± 15	-45/-55 at 10 MHz	
High-Performance (BW >500 MHz) Amplifiers									
LMH6702 [†]	Single	1.7 GHz, ultra-low distortion, wide bandwidth	1.7 GHz	2	3100	12.5	± 5 to ± 6	-63/-70 at 60 MHz	
LMH6703	Single	1.2 GHz, low-distortion op amp with shutdown	1.2 GHz	2	4500	11	± 5 to ± 6	-69/-90 at 20 MHz	
LMH6609	Single	900 MHz, high-output current voltage feedback	900	1	1400	7	± 3.3 to ± 6	-63/-57 at 20 MHz	
LMH6738	Triple	750 MHz, shutdown, 90 mA high-output current	750	1	3300	11	8 to 12	-80/-90 at 5 MHz	
LMH6739	Triple	750 MHz, selectable gain buffer, $A_V = -1, +1, \text{ or } +2$	750	1	3300	10.7	8 to 12	-80/-90 at 5 MHz	
LMH6704	Single	650 MHz, selectable gain buffer with shutdown	650	2	3000	11.5	8 to 12	-62/-78 at 10 MHz	
LMH6732	Single	Adjustable supply current	540	2	2700	9	± 4.5 to ± 6	-60/-64 at 20 MHz	

See footnotes for all High-Speed Amplifier tables on page 10

LMH6702/03/04 – Industry-Leading Speed with Low Power Consumption

LMH6702 Single, Low Distortion, Wide Bandwidth

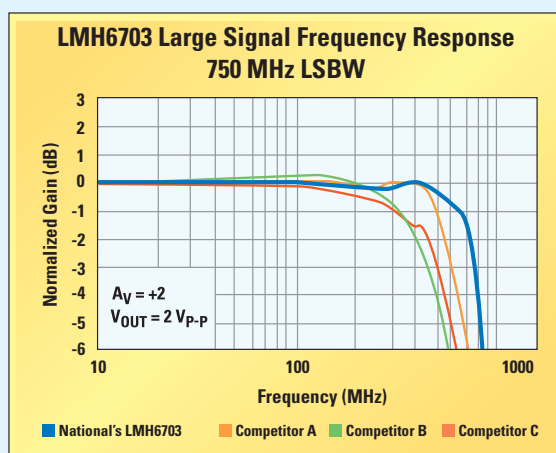
- 1.7 GHz SSBW, 720 MHz LSBW
- 3100 V/ μ s slew rate
- 2nd/3rd HD: -100/-96 dB at 5 MHz

LMH6703 Single, Low Distortion, Wide Bandwidth w/ Shutdown

- 1.2 GHz SSBW, 750 MHz LSBW
- 11 mA supply current
- 2nd/3rd HD: -87/-100 dB at 5 MHz

LMH6704 Single, Selectable Gain (-1, +1, or +2), Shutdown

- 650 MHz SSBW, 400 LSBW
- 90 mA output current
- 2nd/3rd HD: -62/-78 dB at 10 MHz



NTSC Diff. G/P %/Deg.	Typ I _{OUT} (mA)	Settling Time (2V step) ns to %	V _{OS} Typ/Temp (mV)	Voltage Noise (nV/√Hz)	Current Noise i _{nn} (pA/√Hz)	Current Noise i _{ni} (pA/√Hz)	Temp Range	SPICE Model	Blank Eval Board**	Packaging
0.25/0.25	150	50 to 0.1	1/5	7	0.05	0.05	Ind	✓	T	SC70-6
0.11/0.053	112	33 to 0.1	1/7	16	1.14	1.14	Ind	✓	A	SOIC-8, SOT23-6
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	A	SOIC-8, SOT23-5
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	B	SOIC-8, MSOP-8
0.15/0.04	75	68 to 0.1	1/7	17	0.9	0.9	Ind	✓	C	SOIC-14, TSSOP-14
—	20	—	1/4	17	0.75	0.75	Ind	✓	A	SOIC-8, SOT23-5
—	20	—	1/4	17	0.75	0.75	Ind	✓	B	SOIC-8, MSOP-8
—	20	—	1/4	17	0.75	0.75	Ind	✓	A	SOIC-8, SOT23-6
0.3/0.65	40	74 to 0.1	0.9/15	17	1.9	1.9	Com	✓	—	SOIC-8, SOT23-5
0.01/0.02	100	42 to 0.1	0.2/4	14	1.5	1.5	Ind, Mil	✓	—	SOIC-8
0.01/0.02	150	50 to 0.1	2.2/8	14	1.5	1.5	Ind	—	H	LLP-8, SOIC-16, PSOP-8
0.03/0.5	100	48 to 0.1	3/8	12	1	1	Ind	✓	—	SOIC-8
0.28/0.6	90	65 to 0.1	0.4/4	12	1	1	Ind, Mil	✓	—	SOIC-8
0.05/0.04	100	50 to 0.1	2/4	4	3	16	Ind	✓	—	SOIC-8
0.024/0.02	80	13.4 to 0.1	1/6	1.83	3	18.5	Ind	✓	A	SOIC-8, SOT23-5
0.01/0.02	90	10 to 0.1	1.5/9	2.3	3	18.5	Ind	✓	A	SOIC-8, SOT23-6
0.01/0.026	90	15 to 0.05	0.8/3.5	3.1	1.6	1.6	Ind	✓	A	SOIC-8, SOT23-5
0.02/0.01	90	10 to 0.1	0.5/4.5	2.3	3	12	Ind	✓	M	SSOP-16
0.02/0.01	90	10 to 0.1	0.5/4.5	2.3	3	12	Ind	✓	M	SSOP-16
0.02/0.02	90	10	2/8.3	9.3	3	—	Ind	✓	A	SOIC-8, SOT23-6
0.02/0.01	115	18 to 0.04	3/9.9	2.5	1.8	9.7	Ind	✓	A	SOIC-8, SOT23-6

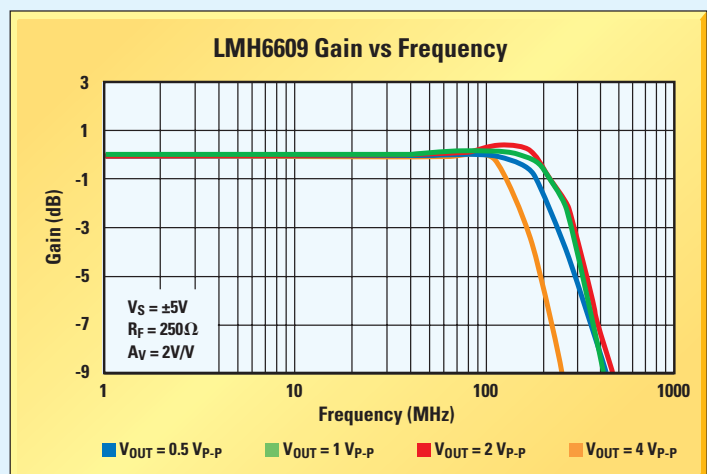
LMH6609 – Ultra-Wideband, Low-Power, Voltage Feedback Op Amp

Features

- 900 MHz SSBW ($A_V = 1$) $V_{OUT} = 0.25 V_{P-P}$
- 280 MHz, -3 dB BW and slew rate 100% tested
- Unity gain stable

Key Applications

- Test equipment
- IF/RF amplifier
- A/D input driver
- Active filter
- Integrator
- DAC output buffer
- Transimpedance amplifier



High-Speed Amplifiers (cont.)

Product ID	Package Type	Key Features	SSBW (MHz)	A_V (V/V) ¹	Slew Rate (V/ μ s)	I_{CC} (mA/ch)	Specified Supply Range (V) ²
Buffers							
New LMH6321	Single	High-speed buffer with adjustable current limit	110	1	1800	11	5 to \pm 15
LMH6559	Single	Ultra-high slew rate, closed-loop buffer	1.75 GHz	1	4580	10	3 to \pm 5
LMH6560	Quad	High-speed, closed-loop buffer	680	1	3100	11.5	3 to \pm 5
LMH6739	Triple	750 MHz, selectable gain buffer, $A_V = -1, +1, \text{ or } +2$	750	1	3300	10.7	8 to 12
New LMH6704	Single	650 MHz, selectable gain buffer with shutdown	650	2	3000	11.5	8 to 12
LMH6718	Dual	Selectable gain buffer, $A_V = -1, +1, \text{ or } +2$	130	2	600	2.6	\pm 2.5, \pm 5 to 6
Fully Differential Drivers							
New LMH6550	Single	Fully differential amplifier with disable	400	1	3000	20	4.5 to 12
New LMH6551	Single	Fully differential amplifier	370	1	2400	12.5	3 to 12
Multiplexers							
New LMH6570	2:1 Mux	500 MHz SSBW, 2200 V/ μ s, -70 dB crosstalk	500	2	2200	15	6 to 12
New LMH6574	4:1 Mux	500 MHz SSBW, 2200 V/ μ s, -70 dB crosstalk	500	2	2200	13	6 to 12
New LMH6572	Triple 2:1 Mux	350 MHz SSBW, 90 dB crosstalk, 1400 V/ μ s slew rate	350	2	1400	23	6 to 12
Low Power							
LMH6723	Single	370 MHz, 1 mA supply, high-output current	260	2	600	1	4.5 to 12
LMH6724	Dual	370 MHz, 1 mA supply, high-output current	260	2	600	1	4.5 to 12
LMH6725	Quad	370 MHz, 1 mA supply, high-output current	260	2	600	1	4.5 to 12
LMH6645	Single	Rail-to-rail input/output, low power	55	1	22	0.73	2.5 to 12
LMH6646	Dual	Rail-to-rail input/output, low power	55	1	22	0.73	2.5 to 12
LMH6647	Single	Rail-to-rail input/output, low power, 10 μ A shutdown	55	1	22	0.73	2.5 to 12

¹Closed-loop gain used to specify most parameters.

²Spec. 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.

³ $A_{VMAX} = 10$

† Mil/space qualified

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

Evaluation Boards

Code	SOIC	SOT-23	SOP/TO-263
A	CLC730227	CLC730216	
B	CLC730036		CLC730123
C	CLC730231		CLC730131
D	CLC730245	CLC730136	
E	CLC730145		CLC730132
F	CLC730033		
G	CLC730066		
H			CLC730121
J	CLC730147		CLC730148
K	CLC730039		CLC730149
L	CLC730150		CLC730151
M			LMH730275
N	LMH730154		
P			LMH730151
Q	LMH730276		
R	LMH730277		
S	LMH6321MR-EVAL		LMH6321TS-EVAL
T	LMH730165		

LMH® High-Speed Features

- VIP10 process technology
- Low harmonic distortion
- Low noise

System Benefits

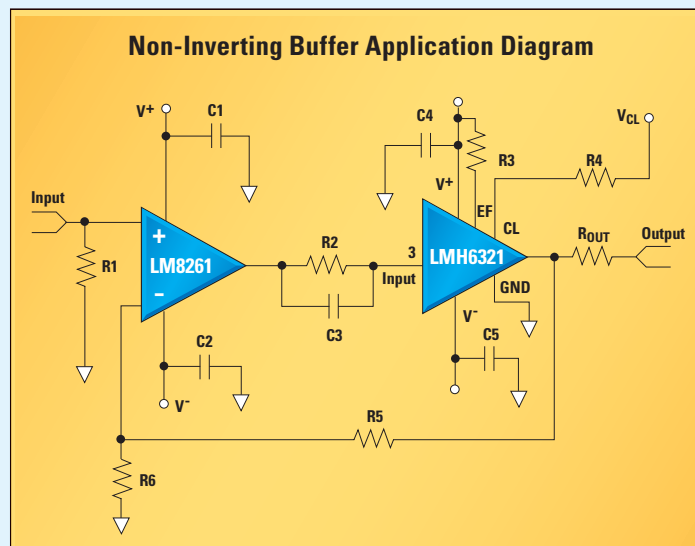
- Enables lowest power for higher bandwidths
- Maintains high signal integrity
- Improves dynamic system performance

	2nd/3rd HD into $R_L = 100\Omega$	NTSC Diff. G/P %/Deg.	Typ I_{OUT} (mA)	Settling Time (2V step) ns to %	V_{OS} Typ/Temp (mV)	Voltage Noise (nV/ \sqrt{Hz})	Current Noise i_{nn} (pA/ \sqrt{Hz})	Current Noise i_{ni} (pA/ \sqrt{Hz})	Temp Range	SPICE Model	Blank Eval Board**	Packaging
	-68/-73 at 1 MHz	—	515	—	4/52	2.8	2.4	—	Ext	✓	S	PSOP-8, TO263-7
	-58/-53 at 20 MHz	0.06/0.02	74	9 to 0.1	3/25	2.8	1.6	—	Ind	✓	D	SOIC-8, SOT23-5
	-58/-52 at 20 MHz	0.1/0.03	74	9 to 0.1	2/25	3	0.9	—	Ind	✓	E	SOIC-14, TSSOP-14
	-80/-90 at 5 MHz	0.02/0.01	90	10 to 0.1	0.5/4.5	2.3	3	12	Ind	✓	M	SSOP-16
	-62/-78 at 10 MHz	0.02/0.02	90	10	2/8.3	9.3	3	—	Ind	✓	A	SOIC-8, SOT23-6
	-84/-84 at 1 MHz	0.04/0.03	200	17 to 0.05	0.2/15	8	9	12	Ind	✓	B	SOIC-8
	-92/-103 at 5 MHz	—	± 75	8 to 0.1	0.5	6	1.5	—	Ind	✓	N	SOIC-8, MSOP-8
	-94/-96 at 5 MHz	—	± 65	18 to 0.05	0.5	6	1.5	—	Ext	✓	N	SOIC-8, MSOP-8
	-68/-84 at 5 MHz	0.02/0.05	80	17 to 0.05	1/21	5	5	—	Ind	✓	R	SOIC-8
	-65/-86 at 5 MHz	0.02/0.02	80	17 to 0.05	1/25	5	5	—	Ind	✓	Q	SOIC-14
	-78/-75 at 10 MHz	0.02/0.02	80	17 to 0.05	1/17.5	5	5	—	Ind	✓	P	SSOP-16
	-65/-63 at 5 MHz	0.03/0.11	110	30 to 0.05	1/3.7	4.3	6	6	Ind	✓	A	SOIC-8, SOT23-5
	-65/-63 at 5 MHz	0.03/0.11	110	30 to 0.05	1/3.7	4.3	6	6	Ind	✓	B	SOIC-8
	-65/-63 at 5 MHz	0.03/0.11	110	30 to 0.05	1/3.7	4.3	6	6	Ind	✓	C	SOIC-14
	—	—	20	—	1/4	17	0.75	0.75	Ind	✓	A	SOIC-8, SOT23-5
	—	—	20	—	1/4	17	0.75	0.75	Ind	✓	B	SOIC-8, MSOP-8
	—	—	20	—	1/4	17	0.75	0.75	Ind	✓	A	SOIC-8, SOT23-6

LMH6321 – Delivers 300 mA, ± 5 mA and $\pm 5\%$ Accuracy

Features

- Stable ± 300 mA continuous current while driving large capacitive loads
- 10 mA to 300 mA at ± 5 mA, $\pm 5\%$ accurate adjustable current limit
- Thermal shutdown protection prevents overheating
- ± 15 V supply voltages allows wide output voltage swings
- High-speed and high-output current for a high-performance system solution



Analog Video Products

Analog Video Products

Product ID	Package Type	Key Features	SSBW (MHz)	LSBW (MHz)	A_V (V/V) ¹	Slew Rate (V/ μ s)	I_{CC} (mA/ch)	Specified Supply Range (V) ²	2nd/3rd HD into $R_L = 100\Omega$	
Video Amplifiers/Buffers										
LMH6702†	Single	1.7 GHz, ultra-low distortion, wide bandwidth	1.7 GHz	720	2	3100	12.5	± 5 to ± 6	-63/-70 at 60 MHz	
LMH6703	Single	1.2 GHz, low-distortion op amp with shutdown	1.2 GHz	750	2	4500	11	± 5 to ± 6	-69/-90 at 20 MHz	
LMH6738	Triple	750 MHz, shutdown, 90 mA high-output current	750	400	1	3300	11	8 to 12	-80/-90 at 5 MHz	
LMH6739	Triple	750 MHz, selectable gain buffer, $A_V = -1, +1, \text{ or } +2$	750	400	1	3300	10.7	8 to 12	-80/-90 at 5 MHz	
LMH6704	Single	650 MHz, selectable gain buffer with shutdown	650	400	2	3000	11.5	8 to 12	-62/-78 at 10 MHz	
New LMH6601	Single	250 MHz, 2.4V CMOS op-amp with shutdown	250	81	1	275	9.6	2.4 to 5.5	-56/-73 at 10 MHz	
LMH6683	Triple	190 MHz, CMIR < 0V, low diff. gain/phase	190	110	2	940	6.5	3 to 12	-66/-54 at 5 MHz	
Multiplexers										
LMH6570	2:1 Mux	500 MHz SSBW, 2200 V/ μ s, -70 dB crosstalk	500	400	2	2200	15	6 to 12	-68/-84 at 5 MHz	
LMH6574	4:1 Mux	500 MHz SSBW, 2200 V/ μ s, -70 dB crosstalk	500	400	2	2200	13	6 to 12	-65/-86 at 5 MHz	
LMH6572	Triple 2:1 Mux	350 MHz SSBW, 90 dB crosstalk, 1400 V/ μ s slew rate	350	290	2	1400	23	6 to 12	-78/-75 at 10 MHz	

See footnotes for all High-Speed Amplifier tables on page 8

Analog Crosspoint Switches

Product ID	Type	Key Features	SSBW (MHz)	LSBW (MHz)	A_V (V/V)	Slew Rate (V/ μ s)	I_{CC} (Total)	Spec Supply Range (V)	Crosstalk	NTSC Diff. G/P %/Deg.	Typ I_{OUT} (mA)	Control Interface	Packaging
New LMH6582	16 x 8	16 inputs, 8 outputs, non-blocking, symmetrical pinout	500	425	1	3000	110 mA	+/-3.3V to +/-5V	-70 dB at 10 MHz, -50 dB at 100 MHz	0.03/0.03	60	Serial or addressed	TQFP-64 with exposed pad
New LMH6583	16 x 8	16 inputs, 8 outputs, non-blocking, symmetrical pinout	500	425	2	3000	110 mA	+/-3.3V to +/-5V	-70 dB at 10 MHz, -50 dB at 100 MHz	0.03/0.03	60	Serial or addressed	TQFP-64 with exposed pad

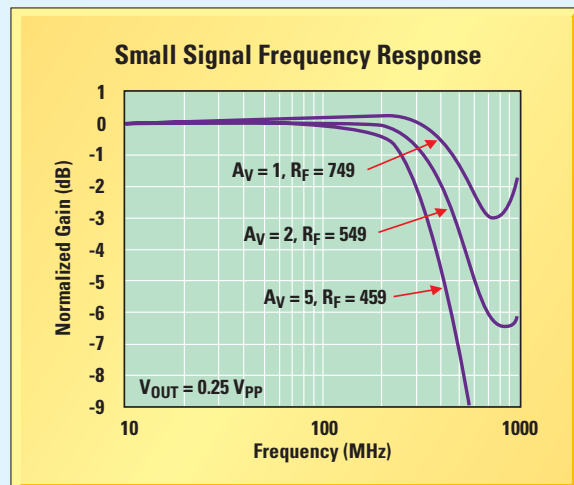
LMH6738/39 – Triple Amplifiers and Selectable Gain Buffers

Features

- 750 MHz, -3 dB small signal bandwidth ($A_V = +2$)
- 400 MHz, -3 dB large signal bandwidth ($A_V = +2$)
- -85 dBc, 3rd harmonic (20 MHz)
- On-chip selectable gain setting resistors for $A_V = -1, +1, +2$ (LMH6739)

Key Applications

- Video
- HDTV
- Video switching and routing systems
- LCD projectors
- Multimedia systems
- KVM switches
- PC-blade servers



	NTSC Diff. G/P %/Deg.	Typ I _{OUT} (mA)	Settling Time (2V step) ns to %	V _{OS} Typ/Temp (mV)	Voltage Noise (nV/√Hz)	Current Noise i _{nm} (pA/√Hz)	Current Noise i _{ni} (pA/√Hz)	Temp Range	Blank Eval Board**	Packaging
	0.024/0.02	80	13.4 to 0.1	1/6	1.83	3	18.5	Ind	A	SOIC-8, SOT23-5
	0.01/0.02	90	10 to 0.1	1.5/9	2.3	3	18.5	Ind	A	SOIC-8, SOT23-6
	0.02/0.01	90	10 to 0.1	0.5/4.5	2.3	3	12	Ind	M	SSOP-16
	0.02/0.01	90	10 to 0.1	0.5/4.5	2.3	3	12	Ind	M	SSOP-16
	0.02/0.02	90	10	2/8.3	9.3	3	—	Ind	A	SOIC-8, SOT23-6
	0.25/0.25	150	50 to 0.1	1/5	7	0.05	0.05	Ind	T	SC70-6
	0.01/0.08	85	42 to 0.1	1/7	12	3	3	Ind	C	SOIC-14, TSSOP-14
	0.02/0.05	80	17 to 0.05	1/21	5	5	—	Ind	R	SOIC-8
	0.02/0.02	80	17 to 0.05	1/25	5	5	—	Ind	Q	SOIC-14
	0.02/0.02	80	17 to 0.05	1/17.5	5	5	—	Ind	P	SOIC-16

Sync Separators

Product ID	Type	Key Features	Supported Video Formats	Inputs	Outputs	Spec Supply Range (V)	Packaging
New LMH1981	50% slicing	Video format detection, macrovision compatible	NTSC, PAL, SECAM, 480i/p, 576i/p, 720p, 1080i/p	0.5 to 2.0 V _{P-P}	H-sync, V-sync, odd/even, burst/clamp, video format, composite sync	3.3 to 5	TSSOP-14
LMH1881	70 mV fixed	Low power, industry standard pinout	NTSC, PAL, SECAM	0.5 to 2.0 V _{P-P}	V-sync, odd/even, burst/clamp, composite sync	5 to 12	SOIC8, DIP-8

Video Converters

Product ID	Title/Function	Supported Video Formats	Inputs	Outputs	YPbPr Path BW (MHz)	RGB Path BW (MHz)	Spec Supply Range (V)	Packaging
New LMH1251	YPbPr to RGBHV converter with integrated 2:1 switch, auto-format detection for YPbPr	480i/p, 576i/p 720p, 1080i/p, XGA, SXGA, UXGA	YPbPr and RGBHV	RGBHV	70	400	5	TSSOP-24

LMH6570/72/74 – Family of Multiplexers

Single 2:1 Mux

LMH6570 Features

- 400 MHz, 2 V_{P-P}, -3 dB bandwidth
- 0.1 dB gain flatness to 150 MHz
- 8 ns channel switching time
- Fully buffered inputs and outputs

Triple 2:1 Mux

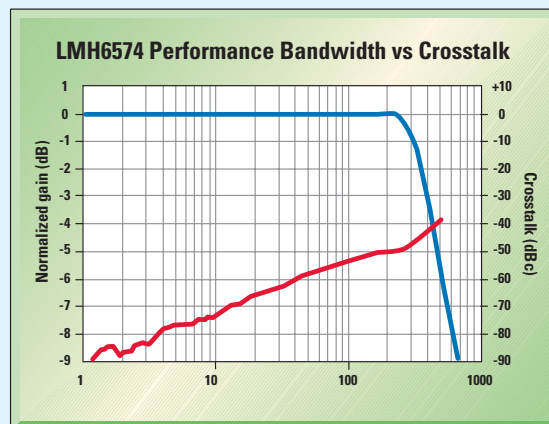
LMH6572 Features

- 290 MHz, 2 V_{P-P}, -3 dB bandwidth
- 0.1 dB gain flatness to 140 MHz
- 10 ns channel switching time
- Fully buffered inputs and outputs

Single 4:1 Mux

LMH6574 Features

- 400 MHz, 2 V_{P-P}, -3 dB bandwidth, A_V = 2
- 0.1 dB gain flatness to 150 MHz
- 8 ns channel switching time
- Fully buffered inputs and outputs



Precision Amplifiers

Product ID	Key Features	Max V_{OS} Room Temp (μV)	Max V_{OS} Over Temp (μV)	TCV_{OS} ($\mu V/^{\circ}C$)	Specified Supply Voltage Range (V)	I_s /Channel (μA)
Precision Amplifiers						
LMV2011	High precision, CMOS, very low drift, no 1/f noise, SOT23-5	25	35	0.015	2.7 to 5.25	930
New LMP2011	Single, high precision, extended temp, CMOS, low drift, no 1/f noise, SOIC-8, SOT23-5	25	60	0.015	2.7 to 5.25	930
New LMP2012	Dual, high precision, extended temp, CMOS, low drift, no 1/f noise, SOIC-8, MSOP-8	25	60	0.015	2.7 to 5.25	930
New LMP2014	Quad, high precision, extended temp, CMOS, low drift, no 1/f noise, TSSOP-14	25	60	0.015	2.7 to 5.25	930
LMC6081	Single, low-power, low I_{BIAS} , CMOS op amp with RRO, SOIC-8	350	800	1	4.5 to 15.5	450
LMC6082	Dual, low-power, low I_{BIAS} , CMOS op amp with RRO, SOIC-8	350	800	1	4.5 to 15.5	450
LMC6084	Quad, low-power, low I_{BIAS} , CMOS op amp with RRO, SOIC-14	350	800	1	4.5 to 15.5	450
LMC6061	Single, micropower, low I_{BIAS} , CMOS op amp with RRO, SOIC-8	350	900	1	4.5 to 15.5	20
LMC6062	Dual, micropower, low I_{BIAS} , CMOS op amp with RRO, SOIC-8	350	900	1	4.5 to 15.5	20
LMC6064	Quad, micropower, low I_{BIAS} , CMOS op amp with RRO, SOIC-14	350	900	1	4.5 to 15.5	20
LMC6001	Single, 10 fA, ultra-low input current with RRO, MDIP-8	350	1000	2.5	4.5 to 15.5	450
LMC6462	Dual, micropower, RRIO, CMOS, SOIC-8, MDIP-8	500	1200	1.5	3.0 to 15.5	40
LMC6464	Quad, micropower, RRIO, CMOS, SOIC-14, MDIP-14	500	1200	1.5	3.0 to 15.5	40
New LMP7701/02/04	12V, rail-to-rail input/output, low-noise CMOS op amp, SOT23-5, SOIC-8, TSSOP-14	200	500	1	2.7 to 12	715
New LMP7711/12	Low-noise, low I_{BIAS} single CMOS input op amp, TSOT-6, MSOP-10	150	450	-1	1.8 to 5.5	1150
New LMP7715/16	Low-noise, low I_{BIAS} single CMOS input op amp, SOT23-5, MSOP-8	150	450	-1	1.8 to 5.5	1150
LMH6624	Single, wideband, ultra-low noise, $0.92\text{ nV}/\sqrt{\text{Hz}}$, op amp, SOIC-8, SOT23-5	750	950	0.25	5 to 12	11400
LMH6626	Dual, wideband, ultra-low noise, $0.92\text{ nV}/\sqrt{\text{Hz}}$, op amp, SOIC-8	750	950	0.25	5 to 12	11400
LMC6482	Dual, low I_{BIAS} , CMOS, RRIO op amp, SOIC-8, MDIP-8	750	1350	1	3.0 to 15.5	500
LMC6484	Quad, low I_{BIAS} , CMOS, RRIO op amp, SOIC-14, MDIP-14	750	1350	1	3.0 to 15.5	500
LMV771	Single, low-noise, 3.5 MHz op amp with rail-to-rail output, SC70-5	850	1000	-0.35	2.7 to 5.5	600
LMV772	Dual, low-noise, 3.5 MHz op amp with rail-to-rail output, SOIC-8, MSOP-8	1000	1200	-0.35	2.7 to 5.5	600
LMV774	Quad, low-noise, 3.5 MHz op amp with rail-to-rail output, TSSOP-14	1000	1200	-0.35	2.7 to 5.5	600
LMV751	Single, low-noise, small package with rail-to-rail output, SOT23-5	1000	1500	—	2.7 to 5.0	600
LM6142	Dual, wide voltage range, mid-speed, RRIO, SOIC-8, MDIP-8	1000	2200	3	1.8 to 24	650
LM6144	Quad, wide voltage range, mid-speed, RRIO, SOIC-14, MDIP-14	1000	2200	3	1.8 to 24	650

All values are taken at 5V, room temperature and are typical, unless specifically noted.

Product ID	Key Features	Common-Mode Voltage (V)	Max V_{OS} (mV)	Max TCV_{OS} (μV)	Gain Output (V/V)
Current-Sensing Precision Amplifiers					
New LMP8270	High common-mode, $A_V = 20$, unidirectional precision voltage difference amplifier	-2 to 36	1	15	20
New LMP8271	High common-mode, $A_V = 20$, bidirectional precision voltage difference amplifier	-2 to 36	1	15	20
New LMP8272	High common-mode, $A_V = 14$, unidirectional precision voltage difference amplifier	-2 to 36	1	15	14
New LMP8275	High common-mode, $A_V = 20$, unidirectional precision voltage difference amplifier	-2 to 36	1	30	20
New LMP8276	High common-mode, $A_V = 20$, bidirectional precision voltage difference amplifier	-2 to 36	1	30	20
New LMP8277	High common-mode, $A_V = 14$, unidirectional precision voltage difference amplifier	-2 to 36	1	30	14

LMP® Precision Features

- Low input bias on the newest VIP50 products (LMP7711)
- Low voltage noise on the LMP7701/11 series
- Auto-correcting PSRR and CMRR specs on the LMP2011 series

System Benefits

- Ensures accuracy in sensor applications
- Increases signal accuracy at low frequencies
- Ensures accuracy over wide dynamic ranges

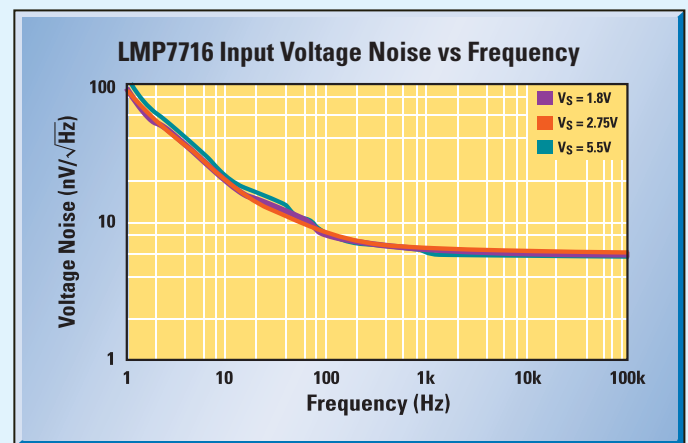
	PSRR (dB)	CMRR (dB)	Gain (dB)	GBWP (MHz)	Voltage Noise (nV/√Hz)	I _{BIAS} Room Temp (pA)	CMVR (V)
	120	130	130	3	35	-3	-0.3 to 3.2
	120	130	130	3	35	-3	-0.3 to 3.2
	120	130	130	3	35	-3	-0.3 to 3.2
	120	130	130	3	35	-3	-0.3 to 3.2
	94	85	130	1.3	22	0.010	-0.4 to 3.1
	94	85	130	1.3	22	0.010	-0.4 to 3.1
	94	85	130	1.3	22	0.010	-0.4 to 3.1
	100	85	140	0.1	83	0.010	-0.4 to 3.1
	100	85	140	0.1	83	0.010	-0.4 to 3.1
	100	85	140	0.1	83	0.010	-0.4 to 3.1
	83	83	122.9	1.3	22	10 fA	-0.4 to 3.1
	85	85	129.5	0.05	80	0.15	-0.2 to 5.3
	85	85	129.5	0.05	80	0.15	-0.2 to 5.3
	100	130	130	2.5	9	0.2	-0.2 to 5.2
	100	100	110	17	5.8	0.1	-0.3 to 4.0
	100	100	110	17	5.8	0.1	-0.3 to 4.0
	82	87	79	1500	0.92	13 μA	2.0 to 4.4
	82	87	79	1300	1	13 μA	2.0 to 4.4
	82	82	130	1.5	37	0.02	-0.3 to 5.3
	82	82	130	1.5	37	0.02	-0.3 to 5.3
	82	80	98	3.5	12	-0.23	0 to 4.1
	82	80	98	3.5	12	-0.23	0 to 4.1
	82	80	98	3.5	12	-0.23	0 to 4.1
	107	103	120	5	6.5	0.2	0 to 3.7
	87	107	108	17	16	170 nA	-0.25 to 5.25
	87	107	108	17	16	170 nA	-0.25 to 5.25

Supply Voltage Range (V)	Typ Supply Current (mA)	Typ PSRR at DC (dB)	Temp Range	Packaging
4.75 to 5.5	1	80	Ext	SOIC-8, MSOP-8, Die
4.75 to 5.5	1	80	Ext	SOIC-8, MSOP-8, Die
4.75 to 5.5	1	80	Ext	SOIC-8, MSOP-8, Die
4.75 to 5.5	1	80	Ext	SOIC-8, MSOP-8, Die
4.75 to 5.5	1	80	Ext	SOIC-8, MSOP-8, Die
4.75 to 5.5	1	80	Ext	SOIC-8, MSOP-8, Die

LMP7715/16 – Single and Dual Precision, 17 MHz, Low-Noise, CMOS Input Amplifiers

Key Applications

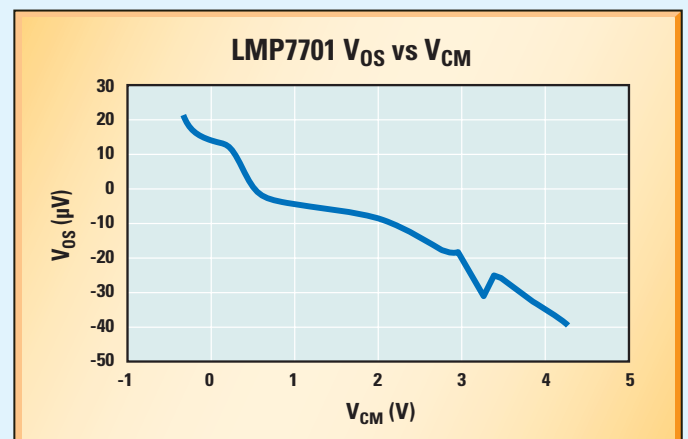
- Active filters and buffers
- Sensor interface
- Transimpedance amplifiers
- Medical instrumentation
- Test and instrumentation
- Battery-powered systems



LMP7701 – 200 μV CMOS 12V Precision Op Amp with RRIO; Operates from -40°C to 125°C

Key Applications

- High-impedance sensor interface
- Battery-powered instrumentation
- Instrumentation amplifier
- High-gain amplifiers
- DAC buffers
- Active filters



CMOS Input Operational Amplifiers

Product ID	Key Features	I _{BIAS} Room Temp (fA)	Max V _{OS} Room Temp (mV)	CMVR (V) at V ₊ = 5
LMC6442	11V dual nano power, low I _{BIAS} with RRO	5	3	-0.2 to 3.85
LMC6041/42/44	S/D/Q micropower op amp family, low I _{BIAS} with RRO	2	3	-0.1 to 2.7
LMC6061/62/64	15V S/D/Q op amp family, micropower, low I _{BIAS} with RRO	10	0.350	-0.1 to 2.7
LMC7111	Single micropower RRIO, 10V, low I _{BIAS} amplifier in SOT23	100	7	-0.2 to 5.2
LMC6462/64	D/Q micropower op amp family, low I _{BIAS} with RRO	150	0.500	-0.1 to 5.3
LMC6572/74	D/Q RRO, 2.7V, low-power, low I _{BIAS} family	20	3	-0.05 to 1.7, V _S = 2.7V
LMC6022/24	15V D/Q low-power, RRO, low I _{BIAS} op amp family	40	9	-0.1 to 2.7
LMC6035/36	15V D/Q op amp family, RRO, low I _{BIAS}	20	5	-0.5 to 4.5
LMC6081/82/84	15V S/D/Q op amp family, low-power, low I _{BIAS} with RRO	10	0.350	-0.1 to 2.7
LMC6001	15V single, 10 fA, ultra-low input current with RRO	10	0.350	-0.1 to 2.7
LMC6482/84	15V D/Q op amp family, low I _{BIAS} with RRIO	20	0.750	-0.25 to 5.25
LMC6492/94	15V D/Q op amp family, low I _{BIAS} with RRIO	20	3	-0.25 to 5.25
LMC7101	Single RRIO 15V, low I _{BIAS} amp in SOT23	1 pA	3	-0.2 to 5.2
Now LMV771/772/774	S/D/Q low-noise op amp family, low I _{BIAS} with RRO	230	1	0 to 4.1
LMV751	Single low-noise op amp with RRO in SOT23	1.5 pA	1	0 to 3.6
LMC8101 w/shutdown	Single 10V RRIO op amp with shutdown in micro SMD	1 pA	±5	-0.2 to 5.2
Now LMP7701/02/04	12V S/D/Q op amp family with RRIO, low-noise, low I _{BIAS}	200	0.200	-0.2 to 5.2
Now LM6211	Ultra low-noise, 24V, low I _{BIAS} single op amp in SOT23	500	2.5	0 to 3.3
Now LMP7711/12	S/D low-noise, low I _{BIAS} op amps with shutdown	100	0.150	-0.3 to 4.0
Now LMV791/792	S/D low-noise, low I _{BIAS} op amps with shutdown	100	1.35	-0.3 to 4.0
Now LMV796/797	S/D low-noise, low I _{BIAS} op amps	100	1.35	-0.3 to 4.0
Now LMP7715/16	S/D precision, low-noise, low I _{BIAS} op amps	100	0.150	-0.3 to 4.0
LMV712 w/shutdown	Dual low-power, low-noise, RRIO with shutdown	5.5 pA	3	-0.2 to 5.2
Now LMV716	Dual RRO low-noise op amp with RRO	600	5	-0.2 to 2.2

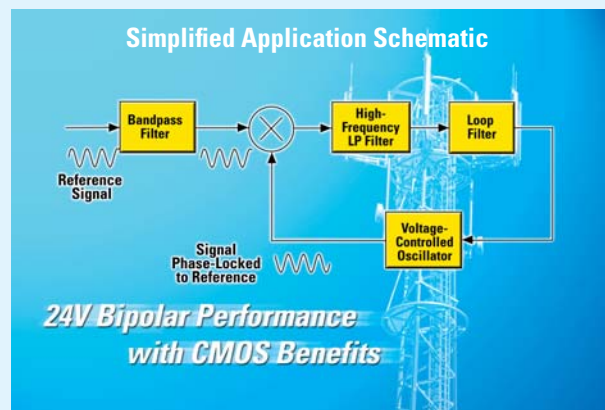
LM6211 – Low-Noise, Rail-to-Rail Output, CMOS Op Amp Operates Up to 24V

Features (typ 24V)

- 5V to 24V supply voltage range
- 5.5 nV/√Hz input referred voltage noise
- 20 MHz unity gain bandwidth
- 400 Hz 1/f corner frequency
- 5.6 V/μs slew rate
- 1.05 mA supply current
- Low input capacitance of 5.5 pF
- Extended temperature range of -40°C to +125°C
- THD of 0.01% at 1 kHz, 600Ω
- Output short circuit current: 25 mA
- PLL loop filters
- Available in SOT23-5 packaging

Applications

- Low-noise active filters
- Strain gauge amplifiers
- Low-noise microphone amplifiers



	Supply Voltage Range (V)	IS/Channel (µA)	PSRR (dB)	CMRR (dB)	Gain (dB)	GBWP (MHz)	Packaging
	1.8 to 11	0.95	95	92	103	0.01	SOIC-8, MDIP-8
	5 to 15	14	75	75	120	0.075	SOIC-8, MDIP-8
	4.5 to 15.5	20	85	85	132	0.1	SOIC-8, SOIC-14
	2.7 to 10	20	85	85	110	0.05	SOT23-5, MDIP-8
	3.0 to 15.5	40	85	85	129.5	0.05	SOIC-8, SOIC-14
	2.7 to 5	40	75	75	120	0.22	SOIC-8, SOIC-14
	5 to 15	43	83	83	120	0.35	SOIC-8, SOIC-14
	2.7 to 15	325	97	96	126	1.4	micro SMD-8, SOIC-8, TSSOP-14, SOIC-14
	4.5 to 15.5	450	94	85	122	1.3	SOIC-8, SOIC-14
	4.5 to 15.5	450	83	83	122	1.3	MDIP-8
	3.0 to 15.5	500	82	82	116	1.5	SOIC-8, SOIC-14
	5 to 15	500	82	82	110	1.5	SOIC-8, SOIC-14
	2.7 to 15	500	82	82	110	1.1	SOT23-5
	2.7 to 5	600	90	90	100	3.5	SC70-5, TSSOP-14, SOIC-8
	2.7 to 5.5	600	107	103	120	5	SOT23-5
	2.7 to 10	700	80	87	103	1	micro SMD-8, MSOP-8
	2.7 to 12	715	100	130	130	2.5	SOT23-5, MSOP-8, TSSOP-14
	5 to 24	960	98	98	110	17	SOT23-5
	1.8 to 5.5	1150	100	100	110	17	TSOT23-6, MSOP-10
	1.8 to 5.5	1150	100	100	110	17	TSOT23-6, MSOP-10
	1.8 to 5.5	1150	100	100	110	17	SOT23-5, MSOP-8
	1.8 to 5.5	1150	100	100	110	17	TSOT23-6, MSOP-10
	2.7 to 5	1220	90	80	130	5	micro SMD-10, LLP-10, MSOP-10
	2.7 to 5	1600	82	80	122	5	MSOP-8

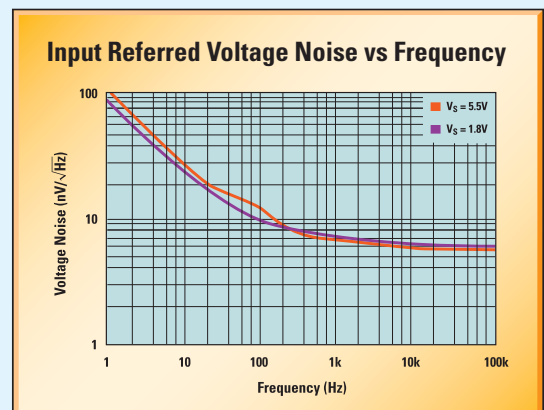
LMV796 – Low-Noise, Low-Power Op Amp

Features

- Low supply current: 1.1 mA
- High unity gain bandwidth: 17 MHz
- Low input voltage noise: $5.8 \text{ nV}/\sqrt{\text{Hz}}$
- Low input offset voltage: 1.3 mV (max)
- Rail-to-rail output with 2 kΩ loads
- High PSRR (100 dB) ensures higher accuracy with noisy supplies
- High CMRR (95 dB) ensures high accuracy over a wide input range

Applications

- Battery-powered systems
- Sensor interfaces
- Embedded systems
- Precision instrumentation



Low-Voltage, Low-Power Amplifiers

Product ID	Key Features	Typ Is/Channel ¹ (µA)	Total Specified Supply Range (V)
Low-Voltage Op Amps			
NEW LMV651/54	12 MHz, rail-to-rail output, low-power op amp	110	2.7 to 5.5
NEW LMV791/92	17 MHz, low-noise, CMOS op amp with low I _{BIAS} current and shutdown	1150/0.14	1.8 to 5.5
NEW LMV796/97	17 MHz, low-noise, CMOS op amp with low I _{BIAS} current	1150	1.8 to 5.5
NEW LMV716	5 MHz, low-noise, RRIO, CMOS input op amp	1600	2.7 to 5
LMV931/32/34	Rail-to-rail input/output 1.8V family	145	1.8 to 5
NEW LPV531	Programmable micropower CMOS RRIO op amp	425	2.7 to 5.5
LMV981/82 w/shutdown	Rail-to-rail input/output 1.8V	145/0.2	1.8 to 5
LMV301	Low-input bias current, 1.8V supply, with rail-to-rail output	163	1.8 to 5
LMC6442	Dual micropower, rail-to-rail output	0.95	1.8 to 11
LMV721/22	Low-noise, low-voltage, and low-power rail-to-rail op amp family	930	2.2 to 5
LM7301	4 MHz rail-to-rail input/output op amp	600	2.2 to 30
LMV821/22/24	High-performance, rail-to-rail output (5 MHz) family	300	2.5 to 5
LMV116/18 w/shutdown	Clock buffer 45 MHz rail-to-rail output amplifiers	600/15	2.5 to 12
LM8262	Rail-to-rail input/output, high I _{OUT} , and unlimited cap. load op amp	1150	2.5 to 22
LM8272	Rail-to-rail input/output, high I _{OUT} , unlimited cap. load	900	2.5 to 24
LM8261	Rail-to-rail input/output, high I _{OUT} , unlimited cap.	970	2.5 to 30
LMV321/24/58	Micropower general-purpose rail-to-rail output op amp family	130	2.7 to 5
LPV321/24/58	Micropower rail-to-rail output op amp family	9	2.7 to 5
LMC6572/74 ¹	CMOS input, rail-to-rail output, 2.7V, low power family	40	2.7 to 5
LMV341/42/44 w/shutdown	Rail-to-rail output op amp family	100/45 pA	2.7 to 5
LMV771/72/74	Low-noise, low-voltage, rail-to-rail op amp family	600	2.7 to 5
LMV710/11/15 w/shutdown	High-output current drive with shutdown (711) and TRI-STATE® shutdown (715)	1170	2.7 to 5
LMV712 w/shutdown	Low-power, low-noise, high-output, RRIO with independent shutdown	1220/0.2	2.7 to 5
LMV422 w/shutdown	Rail-to-rail output with power-select pin	400/2	2.7 to 5.5
NEW LMC7111	Micropower, rail-to-rail input/output amplifier	20	2.7 to 10
LMC8101 w/shutdown	Rail-to-rail input/output with shutdown in micro SMD	700/0.1	2.7 to 10
LMC6035/36 ¹	Mid-range, rail-to-rail output with low I _{BIAS} CMOS inputs family	325	2.7 to 15
LMC7101	Rail-to-rail input/output amplifier	500	2.7 to 15
LM6132/34	High-speed, low-power, rail-to-rail input/output family	360	2.7 to 24

¹A number following / denotes shutdown power, except the LMV422.

²Columns with multiple numbers separated by commas imply multiple grades.

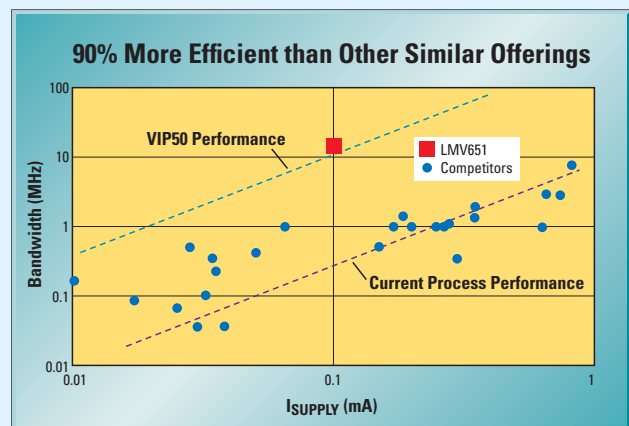
LMV651 – Low Voltage, Low Power Op Amp

Features

- 110 µA supply current
- High unity gain bandwidth: 12 MHz
- Stable with loads up to 500 pF
- Low input offset voltage: 1 mV (max)
- Operates from -40°C to +125°C
- Available in ultra tiny SC70-5 packaging

Key Applications

- Portable equipment
- Automotive
- Battery-powered systems
- Sensors
- Instrumentation



	Typ CMVR ³ (V)	Max V _{OS} ² (mV)	Max I _{BIAS} Over Temperature	Typ GBW (MHz)	Packaging
	0 to 4.1	1	80 nA (typ)	12	SC70-5
	-0.3 to 4.0	1.35	100 pA	17	TSOT23-6, MSOP-10
	-0.3 to 4.0	1.35	100 pA	17	SOT23-5, MSOP-8
	-0.3 to 2.2, V _S = 3.3V	5	130 pA	5	MSOP-8
	-0.2 to 5.2	4	50 nA	1.5	SC70-5, SOT23-5, MSOP-8, SOIC-8, SOIC-14, TSSOP-14
	-0.3 to 3.8	4.5	10 pA	4.6	TSOT23-6
	-0.2 to 5.2	6	50 nA	1.4	micro SMD-6, SC70-6, SOT23-6, MSOP-10
	-0.3 to 3.8	8	50 pA	1	SC70-5
	-0.2 to 3.85	3, 7	4 pA	0.01	SOIC-8, MDIP-8
	-0.3 to 4.1	3	260 nA (typ)	10	SC70-5, SOT23-5, SOIC-8, LLP-8, MSOP-8
	-0.1 to 5.1	6	200 nA at 25°C	4	SOIC-8, SOT23-5
	-0.3 to 4.3	3	150 nA	6.5	SC70-5, SOT23-5, SOIC-8, MSOP-8, SOIC-14, TSSOP-14
	-0.3 to 4.0	±5	-2.2 µA	45	SOT23-6
	-0.3 to 5.3	7	2.7 µA	24	MSOP-8
	-0.3 to 5.3	5	2.7 µA	15	MSOP-8
	-0.3 to 5.3	5	2.7 µA	24	SOT23-5
	-0.2 to 4.2	7	500 nA	1	SC70-5, SOT23-5, SOIC-8, SOIC-14, MSOP-8, TSSOP-14
	-0.2 to 4.2	7	60 pA	0.152	SC70-5, SOT23-5, SOIC-8, MSOP-8, SOIC-14, TSSOP-14
	-0.05 to 1.7, V _S = 2.7V	3, 7	10 pA	0.22	SOIC-8, SOIC-14
	0 to 4.0	4	370 pA	1	SC70-6, SOIC-8, SOIC-14, MSOP-8, TSSOP-14
	0 to 4.1	1.2	100 pA	3.5	SC70-5, MSOP-8, TSSOP-14
	-0.2 to 5.2	3	4 pA (typ)	5	SOT23-5, SOT23-6
	-0.2 to 5.2	3	130 pA	5	micro SMD-10, LLP-10, MSOP-10
	-0.3 to 3.8	4	5 pA	8/0.027	MSOP-10
	0 to 2.7, V _S = 2.7V	7	20 pA	0.05	SOT23-5, MDIP-8
	-0.2 to 5.2	±5	±64 pA	1	micro SMD-8, MSOP-8
	-0.5 to 4.5	5	90 pA	1.4	micro SMD-8, SOIC-8, MSOP-8
	-0.2 to 5.2	3, 7	64 pA	1.1	SOT23-5
	0 to 5	2, 6	180 nA at 25°C	10	SOIC-8, SOIC-14

³Input common-mode voltage range, supply voltage at 5V, unless otherwise noted.

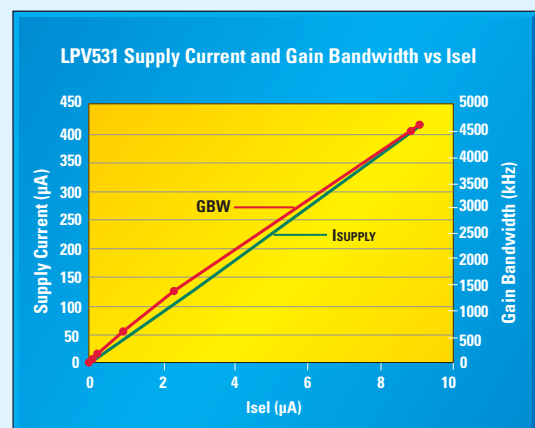
LPV531 – Micropower Op Amp Consumes Less than 15 µW

Features




- Programmable bandwidth
 - 73 kHz in low-power mode at 5 µA
 - 625 kHz in mid-power mode at 42 µA
 - 4.6 MHz in full-power mode at 425 µA
- CMRR of 95 dB
- Rail-to-rail output voltage swing
- 2.7V to 5.5V supply voltage range
- Available in SOT23-6 packaging





Applications

- Low-noise active filters
- Strain gauge amplifiers
- Low-noise microphone amplifiers



Low-Voltage, Low-Power Amplifiers (cont.)

Product ID	Key Features	Typ Is/Channel ¹ (µA)	Supply Range (V)	
Low-Current Op Amps				
 LPV511	880 nA ultra-low power, rail-to-rail input/output op amp	0.88	2.7 to 12	
LMC6442	Dual micropower, low I _{BIAS} CMOS inputs, rail-to-rail output	0.95	1.8 to 11	
LPV321/24/58	Micropower, rail-to-rail output op amp family	9	2.7 to 5	
LMC6041/42/44 ¹	Micropower, CMOS inputs, rail-to-rail output family	10/14	5 to 15	
LMC7111	Micropower, rail-to-rail input/output amplifier	20	2.7 to 10	
LMC6572/74 ²	CMOS input, rail-to-rail output, 2.7V, low-power family	40	2.7 to 5	
LMC6022/24	Low-power, rail-to-rail, low I _{BIAS} CMOS input op amp family	40-43	5 to 15	
LMV341/42/44 w/shutdown	Rail-to-rail output op amp family	100/45 pA	2.7 to 5	
LMV321/24/58	Micropower, rail-to-rail output general-purpose op amp family	130	2.7 to 5	
LMV931/32/34	Rail-to-rail input/output 1.8V family	145	1.8 to 5	
LMV981/82 w/shutdown	Rail-to-rail input/output 1.8V family in SC-70 package	145/0.2	1.8 to 5	
LMV301	Low-input bias current, 1.8V supply, with rail-to-rail output	163	1.8 to 5	
LMV821/22/24	High-performance, rail-to-rail output (5 MHz) family	300	2.5 to 5	
LMC6035/36 ²	Mid-range rail-to-rail output with low I _{BIAS} CMOS inputs family	325	2.7 to 15	
LM6132/34	High-speed, low-power, rail-to-rail input/output family	360	2.7 to 24	
LMC6032/34	Low I _{BIAS} CMOS input, rail-to-rail output family	375	5 to 15	
 LMV422 w/shutdown	Dual rail-to-rail output with power-select pin	400/2	2.7 to 5.5	
Rail-to-Rail Input/Output Op Amps				
 LPV511	12V ultra-low power, rail-to-rail input/output op amp	0.88	2.7 to 12	
LMV931/32/34	Rail-to-rail input/output 1.8V in SC-70 package	145	1.8 to 5	
LMV981/82 w/shutdown	Rail-to-rail input/output 1.8V in SC-70 package	145/0.2	1.8 to 5	
LM7301	4 MHz rail-to-rail input/output op amp	600	2.2 to 30	
LM8262	Rail-to-rail input/output, high-output current, and unlimited cap. load op amp	1.15 mA	2.5 to 22	
LM8272	Rail-to-rail input/output, high I _{OUT} , unlimited cap. load	900	2.5 to 24	
LM8261	Rail-to-rail input/output, high I _{OUT} , unlimited cap. load	970	2.5 to 30	
LMV710/11/15 w/shutdown	High-output current drive with shutdown (711) and TRI-STATE shutdown (715)	1170	2.7 to 5	
LMV712 w/shutdown	Low-power, low-noise, high-output, RRIO with independent shutdown	1220/0.2	2.7 to 5	
LMC8101 w/shutdown	Rail-to-rail input/output with shutdown and micro SMD	700/0.1	2.7 to 10	
LMC7101	Rail-to-rail input/output amplifier	500	2.7 to 15	
LM6132/34	High-speed, low-power, rail-to-rail input/output	360	2.7 to 24	
LMC6492/94	Rail-to-rail input/output	500	5 to 15	

Product ID	Key Features	Typ Is/Channel ¹ (µA)	Supply Range (V)	
Audio Pre-Amps				
 LMV6211	5.5 nV/√Hz, 24V low-noise CMOS op amp in SOT23	960	5 to 24	
 LMV796/97	5.8 nV/√Hz, low-noise CMOS op amp	1150/0.14	2 to 5.5	
 LMV791/92	5.8 nV/√Hz, low-noise CMOS op amp	1150/0.14	2 to 5.5	
LMV751	Low-noise, low I _{BIAS} single CMOS input op amp in SOT23	600	2.7 to 5.5	
LMV721/22	Low-noise, low-voltage, low-power, rail-to-rail output op amp family	930	2.2 to 5	
LMV771/72/74	Low-noise, low-voltage, rail-to-rail op amp family	600	2.7 to 5	
 LMV716	Low-noise, low I _{BIAS} dual CMOS input op amp	1600	2.7 to 5	
LMV710/11/15 w/shutdown	High-output current drive with shutdown (711) and TRI-STATE shutdown (715)	1170	2.7 to 5	
LMV712 w/shutdown	Low-power, low-noise, high-output, RRIO with independent shutdown	1220/0.2	2.7 to 5	
LMV821/22/24	High-performance, rail-to-rail output (5 MHz) family	300	2.5 to 5	
LMV341/42/44 w/shutdown	Rail-to-rail output op amp family	100/45 pA	2.7 to 5	
LMV321/24/58	Micropower general-purpose op amp family with rail-to-rail output	130	2.7 to 5	
LMV931/32/34	Rail-to-rail input/output 1.8V in SC-70 package	145	1.8 to 5	
LMV981/82 w/shutdown	Rail-to-rail input/output 1.8V in SC-70 package	145/0.2	1.8 to 5	

¹A number following / denotes shutdown power, excluding the LMV422.

²Columns with multiple numbers separated by commas implies multiple grades.

Typ CMVR ³ (V)	Max V _{OS} ² (mV)	Max I _{BIAS} Over Temperature	Typ GBW (MHz)	Packaging
-0.1 to 12.1, V _S = 12V	3	1.19 nA	0.027	SC70-5
-0.2 to 3.85	3, 7	4 pA	0.01	SOIC-8, MDIP-8
0 to 4.2	7	60 pA	0.152	SC70-5, SOT23-5, SOIC-8, MSOP-8, SOIC-14, TSSOP-14
-0.1 to 2.7	3, 6	4 pA	0.075	SOIC-8, MDIP-8
-0.2 to 5.2	7	20 pA	0.05	SOT23-5, MDIP-8
-0.5 to 1.7, V _S = 2.7V	3, 7	10 pA	0.22	SOIC-8, SOIC-14
-0.1 to 2.7	9	200 pA	0.35	SOIC-8
0 to 4.0	4	370 pA	1	SC70-6, SOIC-8, SOIC-14, MSOP-8, TSSOP-14
1.0 to 4.0	7	500 nA	1	SC70-5, SOT23-5, SOIC-8, SOIC-14, MSOP-8, TSSOP-14
-0.2 to 5.2	4	50 nA	1.5	SC70-5, SOT23-5, MSOP-8, SOIC-8, SOIC-14, TSSOP-14
-0.2 to 5.3	6	50 nA	1.4	micro SMD-6, SC70-6, SOT23-6, MSOP-10
-0.3 to 3.8	8	50 pA	1	SC70-5
-0.2 to 4.2	3	150 nA	6.5	SC70-5, SOT23-5, SOIC-8, MSOP-8, SOIC-14, TSSOP-14
-0.3 to 2.0, V _S = 2.7V	5	90 pA	1.4	micro SMD-8, SOIC-8, MSOP-8
0 to 5.0	2, 6	140 nA, 180 nA at 25°C	10	SOIC-8, SOIC-14
-0.01 to 2.4	9	200 pA	1.4	SOIC-8, SOIC-14
-0.2 to 5.2	4	5 pA	8/0.027	MSOP-10



-0.1 to 12.1	3	1.19 nA	0.027	SC70-5
-0.2 to 5.2	4	50 nA	1.5	SC70-5, SOT23-5, MSOP-8, SOIC-8, SOIC-14, TSSOP-14
-0.2 to 5.2	6	50 nA	1.4	micro SMD-6, SC70-6, SOT23-6, MSOP-10
0 to 5.0	6	200 nA at 25°C	4	SOIC-8, SOT23-5
0 to 3.3	7	2.7 μA	24	MSOP-8
-0.3 to 12.1, V _S = 12V	5	2.7 μA	15	MSOP-8
-0.3 to 5.1	5	2.7 μA	24	SOT23-5
-0.2 to 5.2	3	4 pA (typ)	5	SOT23-5, SOT23-6
-0.2 to 5.2	3	130 pA	5	micro SMD-10, LLP-10, MSOP-10
-0.2 to 5.2	±5	±64 pA	1	micro SMD-8, MSOP-8
-0.2 to 5.2	3, 7	64 pA	1.1	SOT23-5
0 to 5.0	2, 6	140 nA, 180 nA at 25°C	10	SOIC-8, SOIC-14
-0.25 to 5.25	3, 6	200 pA	1.5	SOIC-8, SOIC-14

Typ CMVR ³ (V)	Voltage Noise (nV/√Hz)	Max V _{OS} ² (mV)	Max I _{BIAS} Over Temp	Typ GBW (MHz)	Packaging
0 to 3.3	5.5	2.5	10 nA	17	SOT23-5
0.3 to 4.0	5.8	1.35	100 pA	17	TSOT23-6, MSOP-10
0.3 to 4.0	5.8	1.35	100 pA	17	TSOT23-6, MSOP-10
0 to 3.8	6.5	1	100 pA	5	SOT23-5
-0.3 to 4.1	8	3	260 nA	10	SC70-5, SOT23-5, SOIC-8, LLP-8, MSOP-8
0 to 4.1	12	1.2	100 pA	3.5	SC70-5, MSOP-8, TSSOP-14
-0.2 to 4.0	12.8	5	150 pA	5	MSOP-8
-0.3 to 5.3	20	3	4 pA	5	SOT23-5, SOT23-6
-0.3 to 5.3	20	3	130 pA	5	micro SMD-10, LLP-10, MSOP-10
-0.3 to 4.3	24	3	150 nA	6.5	SC70-5, SOT23-5, SOIC-8, MSOP-8, SOIC-14, TSSOP-14
-0.2 to 4.2	39	4	370 pA	1	SC70-6, SOIC-8, SOIC-14, MSOP-8, TSSOP-14
-0.2 to 4.2	39	7	500 nA	1	SC70-5, SOT23-5, SOIC-8, SOIC-14, MSOP-8, TSSOP-14
-0.3 to 5.3	50	4	50 nA	1.5	SC70-5, SOT23-5, MSOP-8, SOIC-8, SOIC-14, TSSOP-14
-0.3 to 5.3	50	6	50 nA	1.4	micro SMD-6, SC70-6, SOT23-6, MSOP-10

³Input common-mode voltage range, supply voltage at 5V, unless otherwise noted.

Application-Specific Amplifiers

Display Gamma Buffer and V_{COM} Buffers






Product ID	Key Features	I_{OUT} (mA)	Slew Rate (V/ μ s)	Bandwidth (MHz)
LM8261	Single, 30V, high I_{OUT} with unlimited capacitive load drive op amp	53	15	24
LM8262	Dual, 22V, high I_{OUT} with unlimited capacitive load drive op amp	60	15	24
LM8272	Dual, 24V, high I_{OUT} with unlimited capacitive load drive op amp	100	12	15
LM6588	Quad, 16V, high I_{OUT} drive op amp	170	15	24
 LM8207	18-channel gamma buffer + V_{COM} driver + voltage reference IC	220	4.5	10
 LM8342	Programmable TFT V_{COM} voltage calibrator with memory		—	—

Clock Buffers

Product ID	Title/Function	Typ I_S /Channel	Supply Range (V)	Packaging
Low-Power Clock Buffers				
 LMV112	Dual 40 MHz clock buffer	1.6 mA	2.4 to 5	LLP-8
LMV115	Clock buffer 26 MHz, 2.5G with shutdown	150 μ A	2.7 to 5	SC70-6
LMV116/18	Clock buffer 50 MHz, 3G rail-to-rail output amplifiers	750 μ A	2.6 to 12.8	SC70-6

Specs at $T_A = 25^\circ\text{C}$, $V_S = 5\text{V}$ unless otherwise specified.

RF Detectors

Product ID	Title/Function	Typ I_S /Channel	Supply Range (V)	Packaging
RF Power Detectors for GSM, CDMA, and WCDMA				
LMV248	Dual-band GSM power controller, external detector	1.1 mA	2.5 to 5	LLP-16
 LMV225	Log amp RF power detector for CDMA and WCDMA in micro SMD	4.8 mA	2.7 to 5.5	micro SMD-4, LLP-6
 LMV226	Log amp RF power detector with integrated buffer for GSM, EDGE, GPRS, and TDMA	4.9 mA	2.7 to 5.5	micro SMD-4
 LMV227	Log amp RF power detector for CDMA 2000, WCDMA, and UMTS	4.9 mA	2.7 to 5.5	LLP-6
 LMV228	Log amp RF power detector for CDMA and WCDMA with -15 dBm to 15 dBm detection range	4.9 mA	2.7 to 5.5	micro SMD-4
 LMV232	Dual-mean square detector for 3G mobile communications	9.8 mA	2.5 to 3.3	micro SMD-8
LMV242	Dual channel, GSM/GPRS, TD_SCDMA_MC	8.7 mA	2.5 to 5	LLP-10
LMV243	Single channel, GSM/GPRS, TD_SCDMA_MC	8.7 mA	2.5 to 3.5	micro SMD-8

Specs at $T_A = 25^\circ\text{C}$, $V_S = 5\text{V}$ unless otherwise specified.

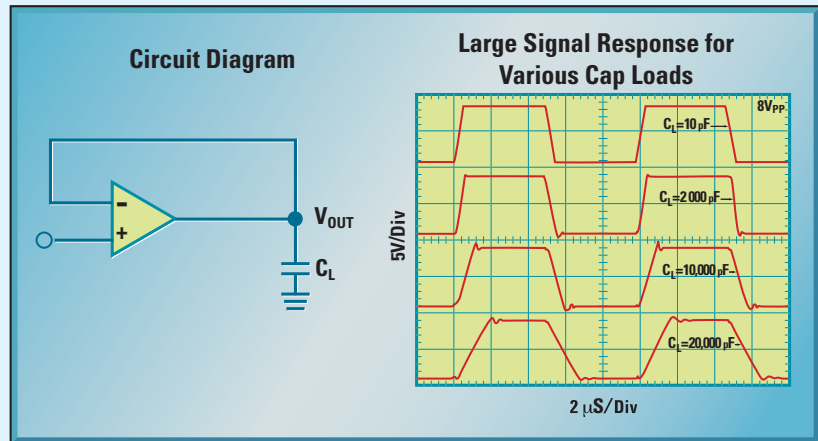
LM8272 – Op Amp Drives 130 mA with Unlimited Capacitive Drive

Features

- Capacitive load capability: 0 to ∞
- Wide voltage range: 2.7 to 24V
- GBW 15 MHz at 12V
- Rail-to-rail input/output
- Supply current: 0.95 mA/channel
- Available in MSOP-8 packaging

Key Applications

- TFT-LCD flat panel V_{COM} drivers
- Panel repair buffers
- Headphone amplifiers
- A/D converter buffers
- High side/low side sensing



LMV225/26/28/32 – Family of RF Detectors

LMV225/26/28 Features

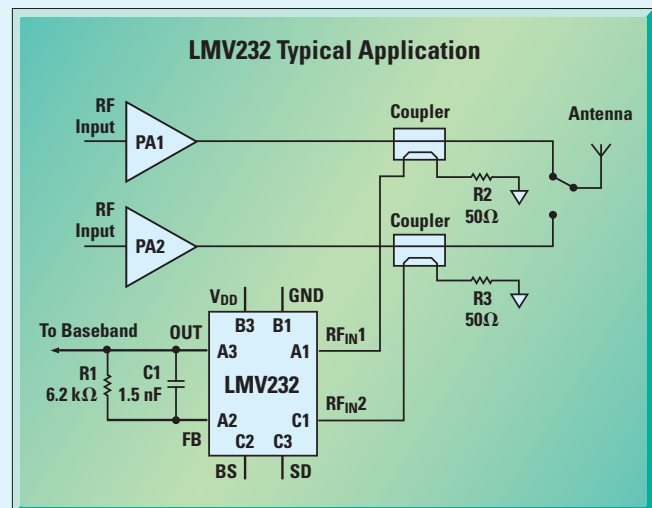
- 30 dB linear in dB power detection range
- Accurate temperature compensation
- Output voltage range 0.2V to 2V
- Logic low shutdown
- Multi-band operation from 450 MHz to 2 GHz

LMV232 Features

- >20 dB square-law detection range
- 2 sequentially selectable RF inputs
- Low power consumption shutdown mode
- Externally configurable gain and LF filter bandwidth
- Internal 50 Ω RF termination impedance
- Optimized for use with 20 dB directional coupler

Key Applications

- CDMA RF power control
- WCDMA RF power control
- CDMA2000 RF power control
- PA module



Comparators

Product ID	Single/ Dual/Quad	Key Features	Typ I _S / Channel (μ A)	Total Specified Supply Range (V)	Max V _{OS} ¹ (mV)	
High-Speed Comparators						
 LMH7220	S	2.5ns, 2.7V to 12V comparator with LVDS output	8.2 mA	2.7 to 12	9	
LMV7219	S	7 ns, 2.7 to 5V comparator with rail-to-rail output	1.1 mA	2.7 to 5	6	
LMV7235	S	45 ns, ultra-low power, rail-to-rail input	65	2.7 to 5	6	
LMV7239	S	45 ns, ultra-low power, rail-to-rail input	65	2.7 to 5	6	
LM161	S	High-speed differential comparator	13 mA	11 to 32	1	
LM361	S	High-speed differential comparator	13 mA	11 to 32	1	
LM119	D	High-speed, dual comparator	4 mA	5 to 36	4	
LM219	D	High-speed, dual comparator	4 mA	5 to 36	4	
LM319	D	High-speed, dual comparator	4 mA	5 to 36	1, 8	
Low-Power Comparators						
 LPV7215	S	Micropower, rail-to-rail input/output, extended input voltage range	0.61	1.8 to 5	3	
LMC7215	S	1 μ A supply, low-voltage, rail-to-rail input, push-pull output	0.7	2 to 8	6	
LMC7225	S	1 μ A supply, low-voltage, rail-to-rail input, open-drain output	0.7	2 to 8	6	
LMC6762	D	Dual, micropower, low-voltage, rail-to-rail input, push-pull output	6	2.7 to 15	5, 15	
LMC6772	D	Dual, micropower, low-voltage, rail-to-rail input, open-drain output	6	2.7 to 15	5, 15	
LMC7211	S	Micropower, low-voltage, rail-to-rail input, push-pull output	7	2.7 to 15	5, 15	
LMC7221	S	Micropower, low-voltage, rail-to-rail input, open-drain output	7	2.7 to 15	5, 15	
LMV7271/72	S/D	1.8V low-volt comparator, rail-to-rail input, push-pull output, dual offered in a micro SMD	10	1.8 to 5	4	
LMV7275	S	1.8V low-volt comparator, rail-to-rail input, open-drain output	10	1.8 to 5	4	
LMV7291	S	1.8V low-volt comparator, rail-to-rail input, push-pull output	10	1.8 to 5	4	
LP339	Q	Ultra-low power quad comparator	15	2 to 36	5	
LMV393	D	Dual, general purpose, low voltage	43	2.7 to 5	7	
LMV339	Q	Quad, general purpose, low voltage	50	2.7 to 5	7	
LMV331	S	Single, general purpose, low voltage	60	2.7 to 5	7	
LM2903	D	Low-power, low-offset voltage dual comparator	200	2 to 36	7	
LM293	D	Low-power, low-offset voltage dual comparator	200	2 to 36	2, 5	
LM393	D	Low-power, low-offset voltage dual comparator	200	2 to 36	5	
LM193	D	Low-power, low-offset voltage dual comparator	200	2 to 36	2, 5	
LM139	Q	Low-power, low-offset voltage quad comparator	200	2 to 36	2, 5	
LM239	Q	Low-power, low-offset voltage quad comparator	200	2 to 36	2, 5	
LM2901	Q	Low-power, low-offset voltage quad comparator	200	2 to 36	7	
LM3302	Q	Low-power, low-offset voltage quad comparator	200	2 to 28	20	
LM339	Q	Low-power, low-offset voltage quad comparator	200	2 to 36	2, 5	
LMV761	S	Low-offset, low-voltage, precision comparator, with push-pull output	225	2.7 to 5	1	
LMV762	D	Dual, low-offset, low-voltage precision comparator, with push-pull output	275	2.7 to 5	1	
LM397	S	Voltage comparator	250	5 to 30	7	
LM392	S	Low-power voltage comparator	500	3 to 32	5	
LM6511	S	180 ns, 3V comparator	2.7 mA	2.7 to 36	5	
LM111	S	Voltage comparator	5.1 mA	5 to 36	3	
LM211	S	Voltage comparator	5.1 mA	5 to 36	3	
LM311	S	Voltage comparator	5.1 mA	5 to 36	7.5	

Specs at T_A = 25°C, V_S = 5V unless otherwise specified.

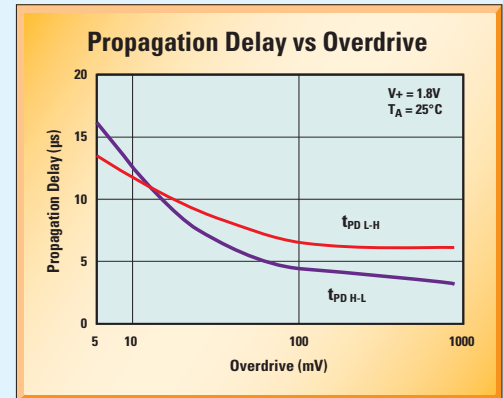
¹Columns with multiple numbers separated by commas implies multiple grades.

²Input common-mode voltage range

	Output Configuration	Typ CMVR ² (V)	Typ Response Time (μs)	Packaging
	LVDS	-0.2 to 10	0.0025	SC70-6, SOT23-6
	Push-pull	-0.2 to 3.8	0.007	SC70-5, SOT23-5
	Open-drain	-0.2 to 5.2	0.045	SC70-5, SOT23-5
	Push-pull	-0.2 to 5.2	0.045	SC70-5, SOT23-5
	Differential	20 to 23	0.014	T05-10
	Differential	20 to 23	0.014	MDIP-14, SOIC-14, T05-10
	Open-collector	8 to 33	0.08	CERDIP-14, CERPAK, CERPAK-10, LCC-20, T05-10
	Open-collector	8 to 33	0.08	CERDIP-14
	Open-collector	7 to 34	0.08	MDIP-14, SOIC-14, T05-10
	Push-pull	0 to 5.0	6.6	SOT-23, SC70-5
	Push-pull	-0.2 to 5.2	12	SOIC-8, SOT23-5
	Open-drain	-0.2 to 5.3	12	SOT23-5
	Push-pull	-0.3 to 5.3	4	SOIC-8
	Open-drain	-0.3 to 5.3	4	SOIC-8, MSOP-8, MDIP-8
	Push-pull	-0.3 to 5.3	4	SOIC-8, SOT23-5
	Open-drain	-0.3 to 5.3	4	SOIC-8, SOT23-5
	Push-pull	-0.1 to 2.8	0.88	micro SMD-5, SOT23-5, SC70-5
	Open-drain	-0.1 to 2.8	0.88	SC70-5, SOT23-5
	Push-pull	-0.1 to 2.8	0.88	SC70-5
	Open-collector	0 to 3.5	8	SOIC-14, MDIP-14
	Open-collector	-0.1 to 4.2	0.6	SOIC-8, MSOP-8
	Open-collector	-0.1 to 4.2	0.6	SOIC-14, TSSOP-14
	Open-collector	-0.1 to 4.2	0.6	SC70-5, SOT23-5
	Open-collector	2 to 34.5	0.4	MDIP-8, micro SMD-8, SOIC-8
	Open-collector	2 to 34.5	0.4	T05-8
	Open-collector	2 to 34.5	0.4	MDIP-8, micro SMD-8, SOIC-8, T05-8
	Open-collector	2 to 34.5	0.4	CERDIP-8, T05-8
	Open-collector	2 to 34	0.5	CERDIP-14, CERPAK, CERPAK-14, Die, LCC-20
	Open-collector	2 to 34	0.5	CERDIP-14
	Open-collector	2 to 34	0.5	MDIP-14, SOIC-14
	Open-collector	2 to 26	0.5	MDIP-14
	Open-collector	2 to 34	0.5	CERDIP-14, MDIP-14, SOIC-14
	Push-pull	-0.3 to 3.8	0.12	SOIC-8, SOT23-6
	Push-pull	-0.3 to 3.8	0.12	SOIC-8, MSOP-8
	Open-collector	5 to 28.5	0.25	SOT23-5
	Push-pull	3 to 30	1.5	MDIP-8, SOIC-8
	Open-collector	3.2 to 34.75	0.18	SOIC-8
	Open-collector	0.5 to 34	0.2	CERDIP-8/14, CERPAK, CERPAK-10, Die, LCC-20, T05-8
	Open-collector	0.5 to 34	0.2	T05-8
	Open-collector	0.5 to 35	0.2	MDIP-8, SOIC-8, T05-8

SPICE models are available at www.national.com/models

LPV7215 – Push-Pull Comparator with 6.6 μs Propagation Delay, Operating Down to 1.8V



Features

- Ultra-low power consumption, draws 600 nA supply current
- Propagation delay: 6.6 μs
- Wide supply voltage range: 1.8V to 5V
- Rail-to-rail inputs and outputs
- Tiny SC-70 packaging

Key Applications

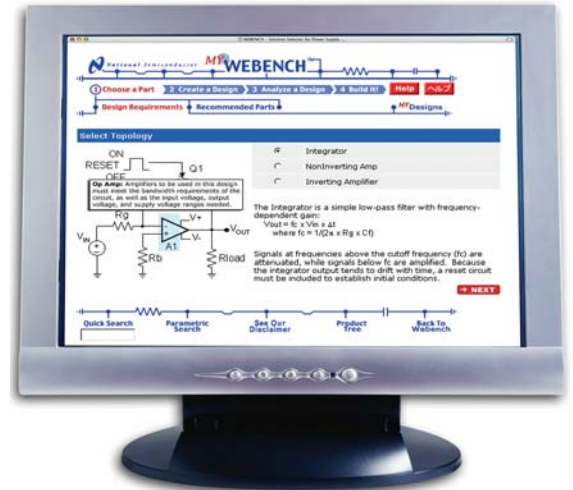
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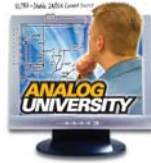
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The VIP50 Process

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(θ_{JA} shown are typical)


micro SMD
(Small and large bump)
 θ_{JA} 220 to 290°C/W


TSSOP
 θ_{JA} 40 to 150°C/W


SC-70
 θ_{JA} 480°C/W


SOT-23
 θ_{JA} 120 to 290°C/W


MSOP
(Mini 8-lead)
 θ_{JA} 220°C/W